

22nd International Conference on IT Applications and Management

Creativity and Entrepreneurship in The Age of 4th Industrial Revolution

July 3 ~ 5, 2019



ITAMS



Supported by:
Korea Database Strategy Society (KDSS)



Chung-Ang University

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Greetings!

It is my great pleasure to introduce the Korea Data Agency (Kdata).

Data is recognized as the essential resource which makes possible what was impossible before, as we enter the era of the 4th Industrial Revolution.

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Kdata encourages creative use of data in the private sector by promoting data distribution and utilization, and nurturing data professionals.

We will spare no efforts so that our society can go one step further with data.

Thank you for your great interest and support.



President of Korea Data Agency

Min Kiyoun

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22nd International Conference on IT Applications and Management

Creativity and Entrepreneurship in the Age of 4th Industrial Revolution

July 3 ~ 5, 2019

Host and venue: Chung-Ang University, Seoul, Korea

Co-host: Korea Data Strategy Society, International ITAM Society

Supported by: Korea Data Industry Promotion Agency, en-Core, MarkAny,
C-Math Omega Point, Korea Association of Entrepreneurship Education

Editorial Board

Myeong Gil Choi (Chung Ang U., Korea)

Sateesh Kumar Ojha (Tribhuvan U., Nepal)

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Preface



The theme of the 22nd ITAM international conference is “Creativity and Entrepreneurship in the Age of 4th Industrial Revolution”. The naming of 4th IR implies, we are going through the fourth wave of extensive technological changes. From this naming, I also interpret, we realized that the digital revolution is not a separate revolution from industrial revolution, but an extension and part of it. In this vein, we are in the middle of the second major technological revolution as the agricultural revolution, which our human ancestors achieved about ten thousand years ago. It also means that there are missions of the industrial revolution we have not yet completed, despite the four hundred years of changes initiated by such innovators as Johannes Gutenberg, James Watt, Michael Faraday and Nikola Tesla. I believe one part of it must be the advancement of complicated technology softly infused into humanity and daily life of all our contemporaries. For this 4IR, we are in need of massive creativity and entrepreneurship in the global scale. In this sense, each and every keyword of this event is of special significance.

The Twenty Second ITAM international conference is hosted by Chung-Ang University, located in Seoul. I appreciate Professors of Chung-Ang University and most of all the organizing chair Myeong Gil Choi for their devotion. I also express my thanks to the people who prepared all the details of the event together with the president of Korea Data Strategy Society, Professor Gyeong Min Kim. As always, Professor Sateesh Kumar Ojha prepared and carried the beautiful proceeding book of the conference. My appreciation also extends to organizations such as Korea Data Industry Promotion Agency, en-Core Inc., MarkAny, CMATH Omega Point for their generous supports. The success of the series of congress relies on the active participants of all the members of ITAM international committee and delegates who contributed their research.

I hope all the delegates enjoy this wonderful academic congress. I join to cherish this wonderful memory meaningful for all the professors, researchers, and most of all, the emerging generation of scholars and managers.

A handwritten signature in black ink that reads "Namjae Cho". The script is fluid and cursive.

Namjae Cho

Chairman, International ITAM Society
Professor, School of Business, Hanyang University, Korea

Conference Management Team

Chairman of International ITAM Society

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[PROGRAM]

Pre-Conference Congress (July 3, WEDNESDAY)

Time	Symposium “Future of Asia”
16:00~17:30	Venue: Faculty Center, Chung-Ang University Chair: Namjae Cho (Chairman, International ITAM Society, Hanyang U. Korea) Keynote Speech Speaker: John Choi (CEO, MarkAny Inc., Korea) Theme: Evolution of Blockchain Technology and Applications to Public Service.
18.00-19.30	Pre-conference Dinner and Campus Tour

Conference Plenary and Technical Sessions (July 4, THURSDAY)

Time	ITAM- 22nd Program
08:15~09:00	Registration (Ground floor)
09:00~10:30	Plenary Inauguration Session
09:00~10:30	Opening Announcement - Myeong Gil Choi (Chair of Org. Committee, Chung Ang U., Korea) Welcoming Remarks - Jung Hee Lee (Dean, School of Entrepreneurship, Chung-Ang U., Korea) Greeting - Gyungmin Kim (Conference General Chair, President of KDSS, Ewha U., Korea) - Namjae Cho (Chairman, International ITAM Society, Hanyang U. Korea) Keynote Speech 1: Speaker: Parag Chandrakant Mankeekar (Founder and CEO, RealLives, India) Theme: Real Lives - Simulating Real World Data for Promoting Empathy & Social-Emotional Skills - key skills of 4th industrial revolution Keynote Speech 2: Speaker: Kanes Rajah (Founder, CEPD London, UK) Theme: Creativity and Entrepreneurship in the Digital Age

Time	Track A	Track B	Track C
11:00~12:40	Session A1 Entrepreneurship And Family Business Chair: Sakuna Srianomai (King Mongkut's Inst. of Tech., Thailand)	Session B1 Social Innovation And Technology Chair: Min Sun Kim (Hyupsung U., Korea)	Session C1 Business Analytics And Intelligence Chair: Ali Abdulbaqi Ameen (Lincoln U. Col., Malaysia)
	Entrepreneurial Factors Affecting SMEs Performance in Processed Agriculture Industry 4.0: Conceptual Framework Pornthep Navakitkanok, Supavadee Aramvith, Achara Chandrachai (Chulalongkorn U., Thailand) Integrating Intellectual Capital and Innovation Strategy: A Conceptual Framework Watcharaphong Leartsurawat, RathPichyangkura and Roongkiat Ratanabanchuen (Chulalongkorn U., Thailand) Decision Making Process of Thai Government Agent for Selection of Technological Startup Companies in Pitching of Concept Ideas Amnard Taweasangrunroj, Roongkiat Ratanabanchuen, Sukree Sinthupinyo (Chulalongkorn U., Thailand) AHP Analysis of Factors Related to the Succession of Family Business: From the View of Successor Yunseok Lee ,Giseob Yu, Namjae Cho (Hanyang U., Korea) Entrepreneurship in Creativity Education for Mathematics: Case of CMATH Seung Hee Lee (Omega Point Inc., Korea)	Vanet as a Component of Intelligent Transportation System Shivangi Chaudhary & Santosh Rangnekar (IIT Roorkee, India) Innovative Product Development Process under Governmental Collaboration in Non-Food Herbal Product Industry: Conceptual Framework Prapaisri Maisont, Tratri Taiphapoon, Achara Chandrachai and Sukree Sinthupinyo (Chulalongkorn U., Thailand) A Study on the Sustained Use of Mobile Payment Services - Comparison of Alipay and Wechatpay in China Giseob Yu, Qiqi, Namjae Cho (Hanyang U., Korea) The Influence of Learning Styles on a Model of IoT- based Inclusive Education and Its Architecture DulanSayassatov, NamjaeCho, (HanyangU., Korea) Delegation Process in Thai National Digital Identity Platform: A Conceptual Framework Pensri Arunwatanamongkol, Nattawut Nupairoj, Uthai Tanlamai (Chulalongkorn U., Thailand) IoT Application Architecture for Senior Service to fulfill Economic, Social, and Personal needs Sanghee Park, NamjaeCho, (HanyangU., Korea)	Examining the Effects of Business Intelligence and Analytics Tools on Decision Quality and Efficiency: A Preliminary Empirical Study Thanachart Ritbumroong (National Institute of Development Administration, Thailand) Integrating AI with Black-Litterman Model for Robo-Advisor: An Enhancement Using Deep Learning- Based Views Min-Yuh Day (Tamkang U., Taiwan), Jheng-Gang Li (Yuanta Securities, Taiwan) Tun-Kung Cheng (Tamkang U, Taiwan) MultiEchelon MultiChannel with Cogent nodes (MEMCC) MAC protocol to Optimize the Performance of IoT implemented in Tourism Industry Vikas Raina¹, Jeetu Sharma², Karuna Jain³ & V. K. Jain⁴ (1,2,4 Mody U. of Sci. & Tech., India., 3Sobhasaria Engineering College, India.) Reward-Based Crowdfunding Decision Model: Conceptual Framework Somboon Prasobpiboon, Roongkiat Ratanabanchuen, Achara Chandrachai, Sipat Triukose (Chulalongkorn U., Thailand) An Efficient CIT-Based Reversible Image Watermarking Method Chien-Chang Chen, Hui-Qin Liu (Tamkang U., Taiwan) The Value of Data Analysis in PhD Research in Management Sateesh Kumar Ojha (Tribhuvan University, Nepal)

12:40~14:00	Lunch		
14:00~15:40	Session A2: Innovations in Organizations Chair: Santosh Rangnekar (IIT Roorkee, India)	Session B2 Technology Use in Service Industry Chair: Yunji Moon (Catholic U. of Pusan, Korea)	Session C2: Management In Practice Chair: Sateesh Kumar Ojha (Tribhuvan U., Nepal)
	The Impact of the Employee's Performance on the Organizational Growth – an Empirical Study on Management Stance Jyoti Arya & Santosh Rangnekar (IIT Roorkee, India)	Challenges and Opportunities in Adopting Telemedicine in Yemeni's Healthcare System Bassam A. Al-Jamrh, Azmawani Abd Rahman, Yuhanis Abdul Aziz, Imm Ng Siew (U. Putra Malaysia, Malaysia)	Recruitment and Selection Practices: Case Study of Five Star Hotels in Nepal Sateesh Kumar Ojha (Tribhuvan U., Nepal), Roopesh Shrestha & Manoj Bhatta (Lincoln U. College, Malaysia)
	Does Empowering Leadership Affect Organizational Innovation A PLS-SEM Approach Majed Alameri, Ali Ameen, Ahmed Al-Shibami (Lincoln U. College, Malaysia)	The Study on the Effect of Self-Service Technologies Service Quality, Novelty, and Social Presence on Repatronage Intention of Cashierless Store Jui-Chun Chai, Hui-Chen Chang (National Taipei U., Taiwan)	Tax Evasion and Its Effects on Taxation Revenue and Economic Growth in Nepal Sunil Man Shakya (Lincoln U. College, Malaysia)
	Technology, Connectivity, and Psychological Contract: Case of South Korean and New Zealand Organizations HeeSun Kim (Yonsei U., Korea) Elena Obushenkova (U. of Auckland, New Zealand)	Toward an Understanding of Mobile Banking Adoption Yunji Moon (Catholic U. of Pusan, Korea) Min Sun Kim (Hyupsung U., Korea)	Alcohol Industry Establishment in Nepal Yeak Narayan Sharma (Saraswati Multiple Campus, Tribhuvan U., Nepal)
	Satisfaction Differences Between Relaxing and Exciting Flow States Shu-Chen Chang (Chinese Culture U., Taiwan)	Need of Digitalization in the Banking Sector for its Growth and Sustainability Prashanta Babu Neupane (Tribhuvan U., Nepal)	Cause of Time and Cost Overruns in the Construction Project in Nepal Bishnu Prasad Khanal (Lincoln U. College, Malaysia)
	Supply Chain Management as a Key Factor for Gaining Competitive Advantage in Soap and Detergent Industries with Reference to Nepal Suman Bhattarai (Lincoln U. College, Malaysia) Sateesh Kumar Ojha (Tribhuvan U., Nepal)	The Effect of e-Learning Actual Use on the Net Benefit among Public Universities Students in Nepal Pradeep Bastola, Ali Ameen, Osama Isaac (Lincoln U. College, Malaysia)	Motivational Measures Adopted in Nepalese Higher Education Sectors Especially in Privately Run Organization Narayan Prasad Aryal (Lincoln U. College, Malaysia) Sateesh Kumar Ojha (Tribhuvan U., Nepal)
15:40~16:00		E-Learning and its Impact on Employability Bachchu Ram Sapkota (Lincoln U. College, Malaysia)	Role of Ecotourism in Sustainable Development of Nepal Surya Bahadur Ghimire (Tribhuvan University, Nepal)
		Why IT purchasing managers behave defensively? : A Conceptual Model Nam Kyu Ahn, Sung Kun Kim (Chung-Ang U. Korea)	
15:40~16:00	Coffee Break		

16:00~17:40	Session A3 ICT Applications and Media Effects Chair: Chih-Chien Wang (National Taipei U., Taiwan)	Session B3 New Developments In Tourism Chair: Yanki Hartijasti (U. of Indonesia, Indonesia)	Session C3 Industry Transformation Chair: Jung Seung Lee (Hoseo U., Korea) (Local language presentation)
	The Role of Design Thinking in Dashboard Design: A Preliminary Study Sakuna Srianomai (King Mongkut's Institute of Technology, Thailand) Phannaphatr Savetpanuvong (Digital Transformation Consulting Co., Thailand) The Study on Value of Self-Regulation Mechanisms in e-Commerce: From Prospects of Consumer Shopping Behaviors Galland, Meng-yo Ger (Science & Technology Policy Research and Information Center, Taiwan) Analyzing Online Fake Business News Communication and the Influence on Stock Price: A Real Case in Taiwan Chih-Chien Wang, Cheng-Yu Chiang (National Taipei U., Taiwan) A Conceptual Framework for Product Design and Development Support System (PDDSS) for Small and Medium Enterprises (SMEs) Preyaporn Teerapornlertratt, Pongpun Anuntavoranich, Santhaya Kittikowit (Chulalongkorn U., Thailand) Study on the Effect of the Emotional Knowledge on the Global IS Project Manager's Agility Eun-Sook Kil, Gyeong-min Kim (Ewha Womans U., Korea) Effects of Information System for Better Practices and Efficient Use of Human Resource Binita Rijal (Lincoln U. College, Malaysia)	Research on Factors of Regional Identification - The Tanabe-Nishimuro Area of Wakayama Prefecture as an Example Masayuki Maruyama (International U. of Kagoshima, Japan) Does Language Barrier Hinder South Korea from Getting More Foreign Tourists? Yanki Hartijasti (U. of Indonesia, Indonesia) & Namjae Cho (Hanyang U., Korea) Basic Research for the Development of International Tourism in Japan Naohisa Kakutani (Meio U., Japan) Process Innovation of Social Media Communication Plan: A Case of Thai Hotel SMEs Torboon Puangmaha, Tatri Taiphapoon, Pakpachong Vadhanasindhu, Sukree Sinthupinyo (Chulalongkorn U., Thailand) The Components of Knowledge Intensive Business Services (KIBS) model for Food Safety Management System (FSMS) in the hotel Pattanan Dansai, Mongkolchai Wiriyapinit, Pongpun Anuntavoranich, Suwimon Keeratipibul (Chulalongkorn U., Thailand) Challenges of e-Tourism implementation in Developing Countries: A Case Study of Nepal Dinesh Basnet (Lincoln U. College, Malaysia) Jayatu Restaurant of Nepal and its Impact on Tourism Neupane Chanda (Lincoln U. College, Malaysia)	Performance Case of Entrepreneurship Education in Chungbuk National University Yookil Choi (Chungbuk Nat'l U. Korea) The Factors Affecting Scale-up Aspiration in Start-ups Across National Economic Growth Stages Hyemi Oh (Sejong U., Korea) Jin Soo Kim (Chung-ang U., Korea) Chaewon Lee (Seoul Nat'l U. of Sci. & Tech., Korea) The Effects of Mobile Shopping Mall Attributes on Consumer Loyalty: Consumers' Experience with O2O Service as a Moderating Variable Hye Jin Kim, Jung Seung Lee (Hoseo U., Korea) A Study on the Effect of Individual Characteristics on the Entrepreneurship and Performance of the Self-Employed. Hye-Jin Jeon (Rehoboth Business Incubator, Korea) Seung-Kwon An (True Education, Korea) A Study on the Influence of Corporate Characteristics of Technological Innovativeness-Type Small Businesses and Technological Innovation Orientation on Innovation Performance Young-Pyo Sue (Chung-Ang U., Korea) Congruity Effects of Self-Image on the Social Enterprise: Focusing on the Comparison between SEN and Non-club Students Ilhan Lee, Jaewhan Park (Chung-Ang U. Korea)

17:40~18:00	Valedictory Session
	1) Closing Address - Myeong Gil Choi (Chung Ang U., Korea) - Namjae Cho (Chairman of International ITAM Society) 2) Announcement of the Next Conference - Santosh Rangnekar (IIT Roorkey, India)
18:30~21:00	Banquet

Post-Congress Event (July 5, FRIDAY)

Time	Industrial Visit
09:00~16:00	Visit Samsung Electronics and Hyundai Automobile Using Chartered bus leaving from Park Hotel, Yeongdeongpo, Seoul and stop over at the front gate of Chung-Ang University.

(IITAMS)
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Chung-Ang University

Entrepreneurial Factors Affecting SMEs Performance in Processed Agriculture Industry 4.0: Conceptual framework

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Abstract

During recent years, the infusion of new digital technologies disruption and Industry 4.0 directly change the production processes and business manners. Entrepreneurs need to be reformed to elevate capabilities in order to deal with such uncertainty enhancing competitive advantages in emerging economies.

In the competitive marketplace, the entrepreneurs concentrated the operating environment were continuing and accelerating sales, market share, and profitability. Entrepreneurship is an important factor in enhancing company success. From the previous study, the factors of entrepreneurship focus mainly on Resource-Based View (RVB), Dynamic Capabilities (DC), Entrepreneurial Orientation (EO), Marketing Orientation (MO) and Learning Orientation (LO) and each orientation view in isolation.

This article studies the mandatory entrepreneurial factors to create entrepreneurship conceptual framework which focusing on processed agriculture industry that is needed. With regard to Entrepreneurial Orientation (EO), Marketing Orientation (MO), Learning Orientation (LO), Digital Orientation (DO) and the readiness to enter the industry 4.0 to encourage entrepreneurs to be able to develop their performance in the rapidly changing environment.

Keywords

Entrepreneurship, Entrepreneurial Orientation, Marketing Orientation, Learning Orientation, Digital Orientation, Industry 4.0.

Introduction

The accelerated technological change and globalization of the economy have a significant effect on the competitive environment of businesses and create new opportunities to strengthen the growth of small and medium-sized enterprises (SMEs). The Thai government has a policy of Thailand 4.0 which is a national development by applying technology, creativity, and innovation in national development. Thailand is in the 3 traps which medium income, imbalance, and inequality. Thailand economic structure that is not yet fully driven by innovation The

industrial sector has produced low productivity, lack of technology. In addition, Thai workers still have problems with quality and performance that are inconsistent with the needs to drive the development of the country. The industrial sector is an important mechanism for driving the Thai economy. The industrial sector needs to be adapted to upgrade the industry that is in accordance with the policy. Germany is a model for Industry 4.0 which specializes on the implementation of smart manufacturing systems by using automation and use wireless systems to control all production. The Changing impact to the economic

structure to "Value-Based Economy" or "Innovation-driven economy". The goal is to increase competitiveness and to increase economic returns.

The agricultural industry is one in the target industry that needs to be promoted in Thailand 4.0. In the agriculture value chain supply including of 3 parts: 1. Planting/Harvesting 2. The Processing 3. The distribution as shown in Figure 1.

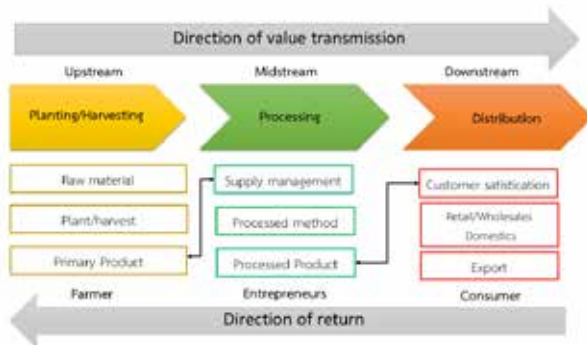


Figure 1. The Value chain of agriculture industry.

There are 2 types of processing agriculture industry, namely food sector and non-food sector, such as woven wicker cloth which can be used for various technologies or innovations to be useful.

Agro-industry sector by using technology in the production and processing processes shows that technology will affect production that helps to increase productivity in production and processing raise the standard for agricultural products. Change the production pattern from the original will help increase the level of competition of agricultural products in the world market.

The entrepreneurs are important in developing the organization to be successful. In order to support the organization to enter Industry 4.0, the competency of the entrepreneurs in various areas must be assessed to adjust the organization strategy to be able to upgrade to Industry 4.0 (Gül T. Temur, 2018).

From the analysis of obstacles to innovation development of SMEs are lack of technological information, personal development in the organization, intellectual property knowledge, government support, marketing information and cooperation with external agencies (Hisrich et al., 2008).

SMEs should take into account the digital technology used in the organization to support good work, reduce costs, expand the user base, but because SMEs may be lagging

behind and are not adept at using digital technology (Nguyen, Newby, & Macaulay, 2015).

Advances in digital technology at present, the agricultural sector is changing as a result of data collected to help analyze decisions. Smart farming will increase the chances of competitiveness from data usage and communications technology. It is expected that the Internet of Things and cloud computing technology will be used to enhance the use of robotics and AI in the agro-industry.

Agricultural entrepreneurs have the desire to seek opportunities in markets where entrepreneurs can gain market share and growth. From various environmental changes, entrepreneurs need more innovative capabilities to gain competitive advantages and create sustainability for the company (Rothaermel, 2008).

This study aims to propose the mandatory entrepreneurial factors to create entrepreneurship conceptual framework which focusing on processed agriculture industry that is needed. First, to study the important factors of the entrepreneurial model which compose of Entrepreneurial Orientation (EO), Market Orientation (MO), Learning Orientation (LO). Secondly, to study the new entrepreneurship factors which composes of Digital Orientation and Industry 4.0 Readiness. Thirdly, to study the existing and new entrepreneurial factors affecting to the firm performance. Finally, the propose conceptual framework for new entrepreneurial factors that affects the operation SMEs in the agricultural processing industry.

Literature review

Entrepreneurial Factors

A. Entrepreneurship, Resource-Based View (RVB) and Dynamic Capabilities (DC)

1) Entrepreneurship

The definition of entrepreneurship covers the scope of activities, processes, and organizational innovations (Gartner, 1988). Creating a new vision (Timmons, J. A., 1990), Opportunity-seeking and Risk-taking (Stevenson et al., 1990).

Characteristics of successful entrepreneurs (Hisrich et al., 2008) are

- Systematic thinking is the power or potential to solve problems in a complex system by requiring various skill sets to create a holistic perspective of a scheme and describe its behavior.

- Resource management by using of available resources to create opportunities.
- Agility and responding to the opportunity to arrive quickly
- Learning ability according to the changing environment
- Ability to understand various aspects to determine appropriate strategies for solving various problems. and can be applied to new situations.

Bairwa, S.L. et al., (2014) argued that entrepreneurs doing agricultural business do not need to be farmers. There is a feature similar to general entrepreneurs, namely, seeking opportunities to have a vision, being able to manage business and organization. However, the nature of the agricultural business, different from general business so the entrepreneurship in agriculture should be different from general entrepreneurs.

2) Resource Based View (RVB) and Dynamic Capabilities (DC)

Barney (1991) argued that resources in the firm must be characterized as 1) Beneficial 2) Rare 3) Inimitable 4) Complicated to replace with distinguishing features that can give the firm sustainable with competitive advantage. Firm's resources and abilities should be valuable, difficult to find, difficult to replace. DC are the foundation of the organization that drives and selects strategies to change, combine resources to enable organizations to offer valuable new strategies (Eisenhardt & Martin, 2000).

The DC in the organization has developed through learning by repetition with new solution which can be done faster and better (Teece et al., 1997). The environment in the organization must provide learning. with both success and failure. DC in the organizations can build by integrate from individual knowledge and being transmitted to the organization level.

B. Entrepreneurial Orientation (EO)

EO is based on the strategic planning process (Mintzberg, 1973). The strategy is the phenomenon of organizational expansion which consists of planning, analysis, decision making (Hart, 1992). EO is a policy and criteria for entrepreneurs to make decisions or take action. Therefore, it can be seen that EO is a strategic process which the factor in making the entrepreneur's decision to accomplish the organization's goals of increasing competitive effectiveness.

The dimension of EO, there are 3 parts: Innovativeness, Risk-taking and Proactiveness (Covin and Slevin's, 1989). Subsequent, 2 more dimensions were added by Lumpkin and Dess (1996), notably competitive aggressiveness and autonomy.

1. Innovativeness: finding new insights, establishing innovative creativity that will lead to innovation, both in the form of services and products by technological approach.
 2. Proactiveness : the ability of the organization to deal with future needs. In seeking new business opportunities and lead to the creation of services and products and create competitive opportunities as the first mover in the market.
 3. Risk-taking : the level of readiness in the management level in project investment in the highest uncertainty and still does not know the exact results.
 4. Competitive aggressiveness : a staunch effort to counter the intimidation obtained from the competition. To achieve the goal or have a better market position.
 5. Autonomy is the independent operation of the leader in ideas and vision for complete and complete action.
- For the 5 dimension of EO as shown in Figure 2



Figure 2 Dimension of EO

C. Marketing Orientation (MO)

Market Orientation is to create and offer value to users by analyzing the needs of customers that are relevant both at present and future (Kohli & Jaworski, 1990). The MO study has two main approaches (Armario et al. 2008). The first approach is the perspective of culture, and the second approach is behavioral.

The first approach, the study of Narver and Slater (1990) defines MO as a very effective and efficient corporate culture by creating behavior to develop a value for customers, including:

1. Customer Orientation: focusing on data collection of customer needs for analysis.

2. Competitor Orientation: focusing on data collection of strategy of competitor for analysis
3. Inter-functional Coordination: the potential of the organization to analyze the data obtained for using in strategic planning to create value in products/services for customers.

The second approach, the study of Kohli & Jaworski (1990). Organizational behavior that cares about customers by focusing on the market consists of 3 parts including:

1. Information gathering: by collecting customer information needs for analysis of external factors that influence change. Monitor and tracking competitor's in order to be able to handle the changing customer requirements.
2. Dissemination: the information digestion need to analyze data from all units and all dimensions to get important information in line with marketing changes.
3. Responsiveness: response from all units in the organization in a process that responds to changing market trends. Starting from finding the target market developing and offering valuable products/services, not just for sales or marketing departments

The MO will not be useful or successful if there are too large data collection which organization could not analyze that information to make decisions correctly. As aforementioned, the MO configuration as in Figure 3.



Figure 3 Dimension of MO

D. Learning Orientation (LO)

Learning Orientation related to the behavior of the firm and activities by using knowledge to develop or enhance competitive advantage (Calantone et al. ,2002). LO creates knowledge which leads to innovation in products, processes, and systems consisting of 3 parts (Baker & Sinkula, 1999):

1. Commitment to learning: considers the value of learning and encourages learning in the organization

and promote the learning environment in the organization.

2. Sharing vision: the members of the organization give priority to learning, sharing ideas to increase learning efficiency.
3. Open-Mindedness: the development of processes that are more original to be more efficient with open mind, accepting new ideas.

Based on the study of Calantone et al. (2002), the study of learning focus has affected the performance of the organization. By adding one more aspect: knowledge sharing is Intra-Organizational knowledge sharing within the organization.



Figure 4 Dimension of LO

E. Digital Orientation (DO)

From the literature review of entrepreneurial factors, only EO MO and LO may not be enough because only emphasize in the needs of customers which cannot create the innovation for new environment (Zhou et al., 2005). By combining MO and LO together, it creates the knowledge that leads to innovation in products, processes and systems (Baker & Sinkula, 1999).

Rapid progress in digital technology therefore having to study entrepreneurship that is affected by digital technology changes. There is a big change in the business model. The increase of opportunities from the digital world from offline business to online.

Digital technology has changed the opportunities and activities of entrepreneurs. Let entrepreneurs be enthusiastic, create relationship between internal and external organizations and offering value to customers (Autio 2017). Digital technology can be used to expand the capabilities of SMEs. Digital entrepreneurship is a phenomenon that occurs with the advancement of technology. information and communication (Le Dinh et al., 2018). The study of Hull et al.(2007),this greatly increased opportunity for entrepreneurs to focus on but there are not many studies in the field of digital entrepreneurs. The definition of DO is the management of

SME strategies for the benefit of creating opportunities in digital technology including attitudes and behaviors that encourage market understanding, proactive innovation, and openness to new ideas.

F. Industry 4.0 readiness

Kagermann, Wahlster, and Helbig (2013) quoted that Industry 4.0 has great potential to deal with changing business and engineering processes by creating new business models including new business unit (Startup) to develop products/services. Industry 4.0 creates new challenges in many areas such as resources, energy management, demographic change which requires effective resource management and also changes in various skills of employees which affects existing employees to be able to work in the new system. Technological innovation capabilities are important things that must be in the organization in order to have the opportunity to compete higher than its competitors by supporting for rapidly changing environment.

Schumacher et al. (2016) quoted that the study of measurement of readiness to enter the industry 4.0 has been studied and developed with 5 models as follow :

- 1) IMPULS model for Industrie 4.0 readiness (K. Lichtblau et al., 2015)
- 2) Empowered and Implementation Strategy model for Industry 4.0 (Lanza et al, 2016)
- 3) Industry 4.0 and Digital Operations Self-Assessment (PricewaterhouseCoop Ers,2016)
- 4) Gartner Maturity Model (Tonelli et al. ,2016)
- 5) Schumacher et al. 2016 and Akdil et al. (2018) proposed maturity and readiness model which measurementsthesmartofproductsandservices,smart of business processes and strategy of organization.

Firm performance

For the purpose of firm performance measurment, normally measured with the business operations, sales and market share. From the study of Lumpkin & Dess (1996) in which many parameter measurements will assist to increase credibility and apply to many contexts (Wales et al., 2013). Subjective data is information obtained from translation or interpret in analyzing the performance of the organization.

By Chapman and Kihn (2009) using 9 measures in both financial and non-financial measurement consisting of

Profit ratio, Equity, Liquidity, Trading value new product development, market share, market development, personal development and public relations. From previous studies for firm performance in financial as shown in Table 1 and non-financial as shown in Table 2

Table 1. Financial performance indicators

Financial	
Dimensions	Authors
Market share	Atuahene-Gima (2001) , Kropp, Lindsay and Shoham (2008), Luo, Sivakumar and Liu (2005), Martin and Javalgi (2016), Tajeddini (2010)
Sale growth	
Profit	
Revenue	
Return of Investment	

Table 2. Non-financial performance indicators

Non-Financial	
Dimensions	Authors
Innovativeness	Kropp, Salavou, H., Baltas, G., and Lioukas, S. (2004), Lindsay, and Shoham (2008) and Keskim (2006)
Customer Satisfaction	He & Wei (2011)

Entrepreneurial model with Firm performance

A.EO-MO-LO and Firm performance

Enabling EO, MO and LO in the organization to gain competitive advantage and increase operational results for organizational growth. It is important that the organization's strategy must be. A recent study of Strategic Orientation that affects performance. By studying that MO is an adaptation process for competition with the environment, while EO and LO are like the organization's resource management process with the organization's environment where EO is the adjustment of new resource assignments through market and product development, while LO is the creation and use of knowledge to change organizational behavior and culture (Grinstein ,2008; Hakala ,2011).

The strategic orientation of the organization is an importance entrepreneurial factors that should be because it will result in a competitive advantage. The ability of the firm is presented as the bundles of skills, which should be instilled in the routine work and requires training

that cannot create within short period of time (Day, 1994). The organization is able to determine the strategy of the appropriate strategies to be above competitors and gain competitive advantage (Hult et al., 2004).

EO, MO and LO have relationships and consequence each other. Firm with EO levels in both innovativeness, risk-taking and proactiveness affecting the development of new products/services (Lumpkin & Dess, 1996). However, in order to achieve business growth entrepreneurs must focus on market demand with MO (Zahra, 2008) by monitoring and monitoring both market demand and customer needs. In addition, LO is the ability to create the basic knowledge in organization to absorb and assimilate new knowledge to create innovation. (Sinkula et al., 1997; Deutscher et al., 2016; Gnizy, Baker, and Grinstein, 2014; Hult, Hurley, and Knight, 2004).

B. DO and Firm performance

Sabai Khin, Theresa CF Ho, (2019) studies the effects of DO to organization performance which consider in both parameters which are financial and non-financial measurement. The result shown that the DO and the digital capabilities direct positive to digital innovation. Furthermore, DO is the importance driving factor of digital innovation which consistence with Sebastian Beutel (2018) that DO effects to profitability and market value of firm performance.

C. Industry 4.0 Readiness and Firm performance

Gül T. Temur (2018) has adopted the IMPLUS model for construction industry organizations rubber industry and produce electrical wires industry. The research found that the organization still lacks the development plan, personnel management into industry 4.0 and links with external agencies and education sectors.

Entrepreneurial model: Conceptual Framework

By Sarah et al., (2018) studied DO with elements from EO-MO-LO factors that promote and enhance efficiency for SMEs in the digital economy, which have not yet study with empirical results. Together with Industry 4.0 affecting the operation of entrepreneurs therefore, the entrepreneurial model should include with of 5 main factors are EO, MO, LO, DO and Industry 4.0 readiness as shown in Figure 5.

By assessing the performance of the firm from the financial and non-financial as shown in Table.1 and Table 2 through 2 control variables, namely the in the business operation lifetime and the Firm's size .

The sample of the study will be separated in 2 main groups.

First group, the experts or specialist projects related to entrepreneurs in processed agricultural projects and the success SMEs in processed agricultural business. The other is SMEs in processed agricultural business.



Figure 5. Conceptual framework of Entrepreneurial model for processed agriculture industry 4.0

In conclusion, the conceptual framework of entrepreneurial model that the factors compose of EO,MO,LO,DO and Industry 4.0 readiness in this paper draws from the literature reviews. Due to changes in digital technology and industry 4.0 revolution, it is necessary to study additional factors that are mandatory for entrepreneurship model which are DO and Industry 4.0 readiness. In this model, the firm's performance can be measured from both parameters which are financial and non-financial. The proposed entrepreneurship model may be applied for the agricultural processing industry 4.0.

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Integrating Intellectual Capital and Innovation Strategy: A Conceptual Framework

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Abstract

Although past literature reports significant and interrelated relationship between intellectual capital, innovation strategy, and firm performance in various combinations, there is little empirical evidence of a unified perspective on the causal structure of the relationship. This study proposes a synergetic conceptual framework on the causal relationship between the three constructs based on the theoretical lens of the resource-based view of the firm and the knowledge-based view of the firm concepts. Building upon the prevailing literature, the proposed integrative framework suggests that the contributory relationship between organization's intellectual capital, and firm performance is mediated by firm's innovation strategies. This study adds to the body of knowledge a conceptual literature in the field of innovation management. Practitioners could also benefit from the proposed framework in their innovation strategy formulation processes.

Keywords

Intellectual Capital, Resources-based View, Knowledge-based View, Innovation Strategy, Strategic Management, Firm Performance,

Introduction

There is an increasing number of studies that have focused on intellectual capital (Edvinsson & Malone, 1997) as a source of firm's competitive advantage and performance. Innovation strategy determines to what degree and in what way a firm attempts to use innovation to execute its business strategy and improve its performance (Gilbert, 1994) and thus is crucial to firm's survival, sustainability and accomplishment. Preceding literature reports significant and interrelated relationships between intellectual capital, innovation strategy, and firm performance in various combinations while more recent studies show three-way relationships.

Whereas there are several established associations, there is little empirical evidence of a unified perspective on the causal structure of the relationship between

intellectual capital, innovation strategy and firm performance. The current body of knowledge also lacks a practical procedure that practitioners can use to articulate their innovation strategy that is appropriate for their firms' intangible values.

Building upon the literature and the theoretical lens of the resource-based view of the firm and the knowledge-based view of the firm concepts, the purpose of this study was to identify the causal structure and develop a conceptual framework of the relationship between firm's intellectual capital, innovation strategy and performance.

Literature Review

Intellectual Capital and Firm Performance

The concept of intellectual capital has arisen and become an interest to researchers since the end of the 20th century, with a variety of definitions. Brooking (1996) defines

intellectual capital as a term given to the combined intangible assets which enable the company to function. Stewart (1997) defines intellectual capital as “packaged useful knowledge” and providing examples of intellectual capital of an organization such as organization processes, technology, patents, employee capabilities, customer information, organizational relationship with suppliers of production factors and shareholders.

Edvinsson & Malone (1997) describe intellectual capital as an intangible value of business organizations which is a combination of the values from every person in the organization, the values from organizational relationships with other entities, and the values from everything that remains at the organization when the employees have returned home.

According to the work of Brooking (1996), there are four components of intellectual capital: human-centered assets, infrastructure assets, intellectual property assets, and market assets. On the other hand, the work of Edvinsson & Malone (1997) designate three components of intellectual capital: human capital, structural capital, and customer capital. Luthy's work (1998) posits that intellectual capital combines the knowledge of a useful organization together in every form and is an important factor for organizations that use knowledge as a basis for their operations (knowledge-based organization). The same author also mentions that understanding of intellectual capital and proper intellectual capital management is necessary for the organization in order to be able to successfully compete in the global market. This study follows the definition of Edvinsson & Malone (1997) with an adjustment of the term customer capital to relational capital to better suits the contemporary context.

Research of the relationship between intellectual capital and firm performance has been extensively studied. Reviews of the literature suggest that intellectual capital is probable to positively correlated with the performance of the organization. Bontis, Keow & Richardson (2000) reported the importance and positive influences of human capital, customer capital and structural capital to firm performance in the Malaysian context. Peña (2002) suggests that human capital, organization capital and relational capital are important intangible assets which positively related to firm performance. Pew, Plowman & Hancock's (2007) reported their findings that intellectual capital is positively related to company performance, the rate of intellectual capital growth is also positively related to company performance, and the contribution of intellectual capital to company performance varies by industry. Inkinen (2015) conducted a systematic

review of empirical research on intellectual capital and firm performance, and reported that intellectual capital influences firm performances through interactions, combinations and mediations.

Indications from the literature review demonstrate the high importance of intellectual capital on the efficiency of business operations and its propensity to the positive relationship with firm performance.

Innovation Strategy and Firm Performance

Strategic management has received attentions from researchers for a long time from the past to the present. There have been many definitions of strategy. Porter (1980) defines strategy as “broad formula for how a business is going to compete, what its goals should be, and what policies will be needed to carry out those goals”. Mintzberg (1987) presents five definitions of strategy: strategy as plan, pattern, position, ploy, and perspective. Nag, Hambrick & Chen (2007) studied the definition of strategic management from the literature and summarizes the definitions within the implicit consensus definition group as “The field of strategic management deals with the major intended and emergent initiatives taken by general managers on behalf of owners, involving utilization of resources, to enhance the performance of firms in their external environments.”

The ongoing studies on strategic management and organizational efficiency result in many theories, concepts, frameworks, and management tools that have been commonly accepted and used in the field of management such as, among others, theory of the business, SWOT analysis, experience curve, corporate strategy and portfolio theory, competitive advantage, industry structure and profitability, value chain analysis, and firm's core competence.

Research of the relationship between innovation strategy and firm performance has also been broadly investigated. Li & Atuahene-Gima (2001) posit that the relationship between product innovation strategy and firm performance was contingent on moderators such as institutional support, environmental turbulence and strategic alliance strategies. De Clercq, Menguc, & Auh, (2009) reported a positive relationship between the use of an innovation strategy and firm performance. Kalkan, Bozkurt & Arman (2014) also reported that intellectual capital, innovation, and organization strategy are positively related to firm performance.

Additionally, Pisano's (2015) also argues that the antecedent for firm's innovation initiatives failures and not being able to maintain the capacity to innovate is not a failure to execute but lack of an innovation strategy which is a dynamic process that comprises constant learning, testing, and revision.

Information from the literature review also establishes the high importance of innovation strategy on the proficiency of business processes and its tendency to the positive relationship with firm performance. It is worth considering that a number of the aforementioned literature reported that some dimension of intellectual capital as explaining constructs to firm performance in conjunction with innovation strategy.

Research Gap

The results of the abovementioned literature review illustrate that intellectual capital is not only a foundation of organization operational capabilities but also acts as a bridge in linking the knowledge and resources of the organization to the external knowledge and resources beyond the firm's border.

Concurrently, the process of establishing and executing firm's innovation strategy plays an important role in managing all of organizational resources, in order to achieve the planned organization's goals with the best attainable level of efficiency and effectiveness. Figure 1 below exemplifies possible relationships between intellectual capital, firm's other resources, innovation strategy, and firm performance.

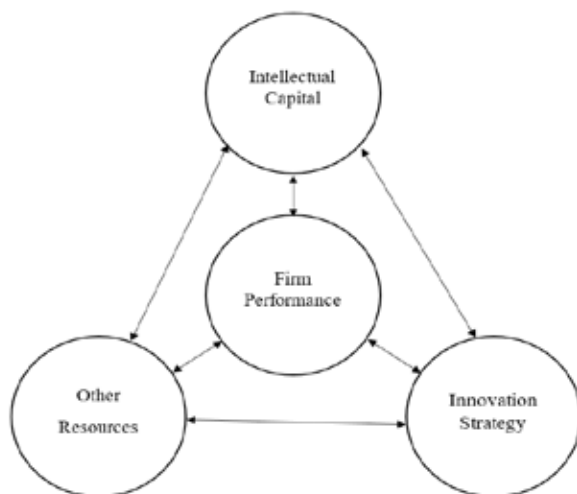


Figure 1 Possible relationships of the four constructs

Based on the review of the literature, there exists a research gap. Despite numerous studies on the related topics, little is known regarding the structural relationship and causal effects between the four constructs. This study therefore proposes a conceptual framework explaining the association to help fill the void in the current body of knowledge.

Methodology

Theoretical Lenses

In order to establish a conceptual framework to explain the causational relationships between intellectual capital, firm's other resources, innovation strategy and firm performance, the resource-based view of the firm and the knowledge-based view of the firm concepts are deployed as the theoretical lenses to explain the relationship in a unified perspective.

The Resource-based View of the Firm

The resource-based view of the firm considers that firm's unique, scarce, and difficult to imitate and transfer resources create sustainable competitive advantages (Barney, 1991; Amit & Schoemaker, 1993) and that firm's core competences and competitive advantage lead to firm performance (Peteraf, 1993; Prahalad and Hamel, 1990).

The Knowledge-based View of the Firm

The knowledge-based view of the firm, extended from the resource-based view of the firm, focuses on firm's knowledge, especially tacit knowledge, which inherits in firm's human resources, cultures and processes as the most strategically important of the firm's resources to create sustainable competitive advantage and organization innovation (Grant, 1996).

As Barney (1997) states that resources are the tangible and intangible assets a firm uses to choose and implement its strategies, knowledge thus can be considered as a valuable firm resource. Demarest (1997) posits that knowledge can be explicit (tangible, clearly stated and consisting of details which can be recorded and stored) or implicit (unstated, based on individual experience and difficult to record and store). Grant (1997) defines "knowing how" with tacit knowledge, and "knowing about facts and theories" with explicit knowledge. Tacit knowledge forms an important element in a firm's knowledge base and has a central role in organizational learning (Howells, 1996). Firm's knowledge, which is embodied in individual and organizational practices, is strategically important. This

knowledge cannot be readily articulated and is difficult for competitors to appropriate and imitate.

Additionally, knowledge is also an important productive resource in terms of its contribution to value added and its strategic significance (Grant 1997: Spender & Grant, 1996). Knowledge-based resource refers to skills, abilities, and learning capacity people can develop through experience and formal training (Jackson, Hitt & Denisi, 2003).

Preliminary Conceptual Framework

From the theoretical lenses of the resource-based view of the firm and the knowledge-based view of the firm, the four constructs of intellectual capital, firm's other resources, innovation strategy and firm performance can then be rationalized and categorized, under the concept of causes and effects, into three dimensions. The three dimensions consist of firm's resources and capabilities, firm's strategic management activities, and firm's performance. The three dimensions linear relationship is also proposed as depicted in figure 2 below.



Figure 2 Preliminary Conceptual Framework

Resources and capabilities

Firm's resources consist of tangible resources and intangible resources. All three components of intellectual capital: human capital, structural capital, and relational capital are knowledge-based thus fall under the category of intangible resources as described by the theoretical lenses of the resource-based view and the knowledge-based view. On the other hand, firm's other resources such as buildings, plants, equipment, production lines and raw materials are considered to be tangible resources. The combination of firm's tangible and intangible resources eventually leads to firm's capabilities

Strategic Activities

Innovation strategy can be separated into two main strategic activities: innovation strategy formulation process and innovation strategy execution process. These two processes utilize firm's resources and capabilities to efficiently and effectively achieve the planned innovation goals through management expertise and experiences. These two strategic activities contribute

to firm's innovation strategy orientation which in turn, subsequently lead to firm's performance.

Firm Performance

Firm performance incorporates both firm financial performance and firm non-financial performance. Financial performance represents monetary or economically gains received from firm's strategically utilization of its resources and capabilities such as sales, fees, rents and royalties. Non-financial performance includes other forms of gains such as customer loyalty, trusts, goodwill and brand awareness.

Results

Proposed Conceptual Framework

Constructing on the aforementioned methodology and the preliminary conceptual framework, this study proposes a synergetic conceptual framework on the causal relationship between intellectual capital, innovation strategy, and firm performance based on the theoretical lens of the resource-based view of the firm and the knowledge-based view of the firm concepts as illustrated in figure 3 below.

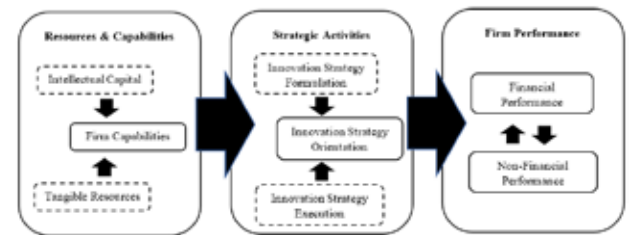


Figure 3 Proposed Conceptual Framework

Proposed Relationships

Building upon the proposed conceptual framework and the literature, this study postulates that, the original three constructs level, the contributory relationship between organization's intellectual capital, and firm performance is mediated by firm's innovation strategies.

Additionally, this study also suggests four propositions on the relationship between the greater dimension constructs of the proposed conceptual framework as below.

Proposition 1. Firms with high level of resources and capabilities and high level of strategic activities will likely have high firm performance.

Proposition 2. Firms with high level of resources and capabilities and low level of strategic activities will likely have medium-low firm performance.

Proposition 3. Firms with low level of resources and capabilities and high level of strategic activities will likely have medium-high firm performance.

Level of Firm's Resources and Capabilities	High	Medium-Low Firm Performance	High Firm Performance
	Low	Low Firm Performance	Medium-High Firm Performance
		Low	High
		Level of Firm's Strategic Activities	

Figure 4 Proposed Relationships

Discussion

This study proposes a synergetic conceptual framework on the causal relationship between the intellectual capital, innovation strategy and firm performance based on the theoretical lens of the resource-based view of the firm and the knowledge-based view of the firm concepts. The findings of this study shed some lights on the integration of firm's intellectual capital and innovation strategy. This study's explanation for the proposed causal relationships is based on the theoretical lenses, past literature, and the logical explanation of the constructs' causes and effects. The next step is to test if the proposed conceptual framework and the four propositions are academically legit and empirically supported. These testing and empirical findings should yield fruitful results that can be used to further assess and improve the proposed integrative conceptual framework.

One major challenge is to properly operationalize proxy variables and collect sufficient necessary data to statistically represent the proposed constructs in the empirical study. To further explore the conceptual framework, the authors of this study suggest a mixed method research. The interested researcher could use qualitative research approach to refine and reconstruct the proposed conceptual framework and the proposed

structural relationships from a broader literature review or an in-dept interview with related practitioners. Seeking an assistance from a panel of experts in the area of intellectual capital or strategic management before conducting further empirical study is also highly recommended.

Conclusion

This study is adding to the body of knowledge the structural relationship between intellectual capital, innovation strategy, and firm performance in a unify perspective. Practitioners could also benefit from this study's findings by utilizing the proposed conceptual framework to establish their innovation strategy based on their intellectual capitals. However, since this study is still in the very early stage of research and much more improvement is vastly needed, there could be many limitations such as generalization ability of the proposed conceptual framework when applied to specific industry or country settings.

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Decision Making Process of Thai Government Agent for Selection of Technological Startup Companies in Pitching of Concept Ideas

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Abstract

Thai government has an attempt to bring country out of the middle income trap by using innovation strategy to drive the economy under the Thailand 4.0 policy. In responding to this policy, government agents play an important role to support startup companies by providing funding for their new ideas about products or services. This research studies the decision-making process under Multi Criteria Decision Making (MCDM) in the selection of technological startup companies to receive funding by the government agent called GISTDA. The business area of technological startups that will be a sample of this research is companies that particularly use Unmanned Aerial Vehicles (UAV) technology. Startup pitching data at the conceptual idea will be analyzed with several techniques in MCDM approach such as TOPSIS. Subsequently, the ranking of each technique will be compared to find which technique is the most accurate approach to the result from GISTDA.

Keywords

Tech startup, UAV, government agent, decision making process and MCDM

Introduction

Thailand is a large and important economy in Southeast Asia. In order to develop the Thai economy more sustainability, the Thai government has an attempt to bring the country out of the middle income trap by using an innovation strategy to drive the economy under the Thailand 4.0 policy. Thailand 4.0 policy focuses on developing innovations in 5 groups of industries as follows.

- Food, agriculture & biotechnology
- Health, wellness & bio-medical
- Smart devices, robotics & mechatronics
- Digital, internet of things, artificial intelligence & embedded technology
- Creative, culture & high value services

In responding to this policy, government agents play an important role to support tech startup companies by providing funding for their new ideas about products and services. This initial fund by government agents can support tech startup companies to initiate their business in the market which will lead to income generated to the country in the future.

Typically, a government agent provides funding to new startup companies who cannot raise funds from venture capital business or other channels such as banks. Funding supported by the government through government agents is so popular in developing countries [1], [2]. However, government agents have not expected returns in terms of money from their investment but aim to support entrepreneurs to be able to stand in the business world and drive the national economy eventually.

This research studies the decision-making process under Multiple Criteria Decision Making (MCDM) in the selection of technological startup companies to receive funding by the government agent called GISTDA. The business area of technological startups that will be a sample of this research is companies that particularly use Unmanned Aerial Vehicles (UAV) technology. Startup pitching data at the conceptual idea will be analyzed with several techniques in the MCDM approach such as TOPSIS and SAW. Subsequently, the ranking of each technique will be compared to find which technique is the most accurate approach to the result from GISTDA.

Fund Provided by Government Agent

Currently, the funding of government agencies is very important for technological startup companies in Thailand to build their new ideas to products and services. Besides, those companies more easily approach the government agent's fund than others such as venture capital business, angel business or bank. Governments of developing countries tend to invest in startup companies via government agents that are not expected the return on investment but aim to support entrepreneurs to survive in the business world and generate income to the country eventually [2].

For the government agent's operation to provide funding, there are some differences from venture capital businesses such as the agent needs a lower return or does not need to have any position in funded companies. Some government agents may lack monitoring the business performance which leads to overspending or the funded companies do not focus on the first business idea. In the selection process, there is a lack of due diligence for the venture-funded and some government agents may tend to have biases or preferences in the selection process which is influenced by government supporters or politicians. [1] Therefore, mechanism of the decision-making process should reduce these issues effectively and be an important part to select potential startup company to provide funds more efficiently as well as creating transparency in the selection process [13].

Problems for Multiple Criteria Decision Making in Private and Public Equity Market

In the present, startup companies mainly seek funding from venture capitalists and angel investors in the seed stage, series A or series B. The funds will be used to nurture their business for surviving in the business world. For investor perspective, they had to carefully invest to startup companies because there was a trend that unicorn companies could not make profit as

expected and it could be in "bubble stage" for technology SMEs in the near future [22] Therefore, the decision making in selection process should be efficiently improved to make an investment in a potential company. By literature review, several techniques of multiple criteria decision making were widely used to improve decision making in the selection process of venture capitalists, angel investors as well as government agents more efficiently.

In the year 2000, Shin and Lee [20] proposed MCDM with using Analytic Hierarchy Process (AHP) to evaluate new ventures for investment that investors expected high returns in the future. The main criterions of management, technical and marketing capabilities were used, and each main criterion consisted of 3 sub criterions. One advantage of AHP was the explicit structure of the venture selection process, however, AHP used the pairwise comparison for the selection of alternatives that should come from the same industry. Biem and Levesques used multi attribute value theory (MAVT) to support the venture capitalist's decision making to select attractive companies for their investment. This method could reduce the biases of decision makers and bring transparency to the selection process. Decision makers would mainly evaluate business plans on 4 criterions which were management and governance, the flexibility of offers, marketing and return on investment and they were the goal of the selection. MAVT supported decision makers to evaluate business plans thoroughly and systematically [8]. In the year 2010, Zheng studied the selection process of investors to evaluate venture capital companies for their investments by using the fuzzy AHP technique. The evaluation system in this study had 3 levels of hierarchy as high, medium and low levels. In each level, the attributes of venture capital companies would be considered such as ethic, capabilities, performance and risk eagerness. With this system, good venture capital companies would be selected more efficiently and eliminated undesirable consequences from their investments [13]. As another application of fuzzy AHP, Zhang brought the method to prioritize risks that could support venture capitalists to reduce risks in the venture selection process and maximum return on investment as venture capitalists' objective [23]. There was an interesting method of MCDM that was fuzzy goal programming that was used for the application of the venture capitalist's decision-making process. Venture capitalists used this method to select appropriate startup companies that had been already passed the seed stage of funding [5]. Next, Dadzie et al. proposed a method of decision making that was fuzzy PROMETHEE to select potential startup companies who were appropriate to the

government venture capitalist's investment [2]. E.A. Dadzie and A. A. Dadzie used the fuzzy Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) in the decision-making process of government venture capital that this technique could reduce biases of decision makers and build transparency in the process [1]. There was a study of the selection process for technological SMEs in the USA by Yang and Zhao who proposed modified PROMETHEE II in the process. They found that startup businesses in the USA had been in the bubble stage, therefore, venture capitalists should pay more attention in the selection process than the past and improve the selection process more efficiently [23]. As literature reviewed, MCDM could be widely applied to the problem of venture capitalist's decision-making process and improved the venture selection process to increase efficiency, transparency and return on investment as well as reduce biases and risks in decision makers.

Methodology

The research methodology consists of 2 methods which are observation and numeric analysis. For the observation, the researcher attended the conceptual idea competition in the UAV startup 2019 program which was held with the cooperation of Geo-Informatics and Space Technology Development Agency (GISTDA) and National Innovation Agency (NIA). This program has been operating since 2017 which have the main objective to provide funds to particularly technological entrepreneurs, who are developing Unmanned Aerial Vehicle (UAV) technology, for building products and services. Participants of this program were divided into two groups based on applications. The first group was dual use technology which UAV could be used for 2 applications and another group was disaster technology that UAV could be especially used in disaster situations such as flooding. In the competition, the researcher would observe the decision-making process of the committees, criteria and their weighting and evaluated scores of each participant which would be used as the input for numeric analysis to calculate results.

For numeric analysis, MCDM approaches used in this research are consisted of the weight sum method, Simple Additive Weighting (SAW) and Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS), which the methods are appropriate with the data from selection process which each committee evaluated participants' performance by using the cardinal score. One of the most popular methods for MCDM is Analytical Hierarchy Process (AHP) that will not be used in this research because the committees of the competition did not evaluate participants'

performance by pairwise comparison method, but they used the preemptive decision making to evaluate [16]. However, the technique of pairwise comparison will be used to construct the weights of experts which are an outsider's opinion to support the decision of selection qualified participants to pass the next round and provide a fund for building prototypes. The research framework that is used in this paper, is shown in Figure 1.

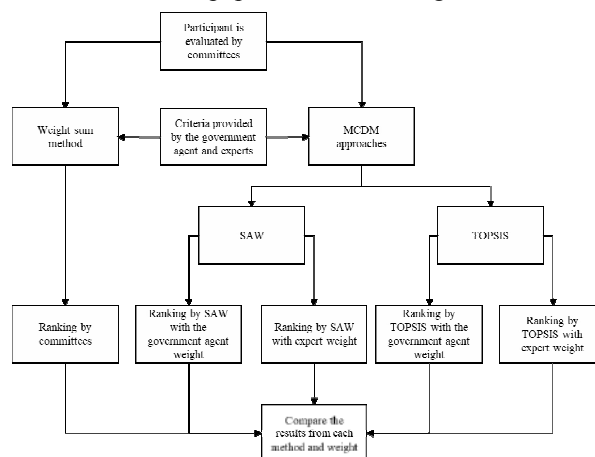


Figure 1 – Research framework for numeric analysis

To implement this analysis, the scores evaluated by committees would be used as input to well-known MCDM approaches, weight sum method, SAW and TOPSIS to identify qualified participants for the next round of incubation and prototype. 7 criterions used were weighted with 2 different methods, the first method did weights by the government agent and another method did weights by experts with a pairwise comparison. The results of three MCDM approaches would be compared to find differences and the approach was the most accurate approach to the result from GISTDA.

Multiple Criteria Decision Making

Currently, a key problem of starting a business is finding out a capital to nurture the business activities of the company. Although there are several sources of funds to provide funds to ventures, the ventures should be presented its performance or their potential in making profits and business growth. By investor perspective, to acquire some potential ventures for investment is a tendency of receiving a return on investment in the future. Therefore, the decision-making process to select a venture to invest is very important. For improve the decision-making process more efficiently, the theory of multiple criteria decision making (MCDM) is applied to the problem of selection tech startup companies for investment.

There are many applications of MCDM to solve several problems in daily life [6], businesses [3], [4], [7], [9], [14], [15], logistic[16], education [10], [18] and etc., which main purpose of MCDM is selecting the best alternative from all alternatives [12], [19], [21]. Mathematically, MCDM can be expressed as matrix format as shown Equation (1).

$$D = \begin{matrix} & C_1 & C_2 & \dots & C_n \\ \begin{matrix} A_1 \\ A_2 \\ \dots \\ A_m \end{matrix} & \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2n} \\ \dots & \dots & \dots & \dots \\ x_{m1} & x_{m2} & \dots & x_{mn} \end{bmatrix} \end{matrix} \quad (1)$$

Where x_{ij} is the rating of alternative A_i with respect to criteria C_j .

Simple Additive Weighting (SAW)

The simple additive weighting method is well known as the weighted linear combination or scoring method that is the most used MCDM technique [19]. This method is based on the weight sum method. The total score is calculated for each alternative by multiplying the scale rating for each attribute value by the importance weight assigned to the attribute and subsequently, summing the products overall attributes [3], [12]. SAW method needs a comparable scale for all elements in the decision matrix. The comparable scale is calculated by using Equation (2) for both positive and negative criteria [12], [15].

$$r_{ij} = \begin{cases} \frac{x_{ij}}{\max_i x_{ij}} & j \text{ is positive criteria} \\ \frac{\min_i x_{ij}}{x_{ij}} & j \text{ is negative criteria} \end{cases} \quad (2)$$

r_{ij} is the rating performance normalized of alternative A_i in criteria C_j ; $i = 1, 2, 3, \dots, m$ and $j = 1, 2, 3, \dots, n$. The total score of each alternative comes from weights of each attribute that is shown as Equation (3).

$$V_j = \sum_{i=1}^n w_j r_{ij} \quad (3)$$

Where greater V_i is indicated that alternative A_i should be selected as the best alternative. Basically, the summation of the normalized weights is equal to 1.

Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS)

TOPSIS is based on the selection of the alternative that has the shortest distance from the positive idea solution and farthest from the negative idea solution. So that the selected alternative by TOPSIS is most probably the best alternative. [12], [17], [19]. TOPSIS assumes that each attribute in the decision matrix Equation (1) takes either monotonically increasing or monotonically decreasing utility. Therefore, the steps of TOPSIS,

which are used in this research, will be shown as follows.

Step 1: Calculate the normalized decision matrix as Equation (4).

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^m x_{ij}^2}} \quad (4)$$

Step 2: Calculate the weighted normalized decision matrix.

$$V_{ij} = r_{ij} W_j \quad (5)$$

Where W_j is the weight of j th element and $\sum_{j=1}^n W_j = 1$.

Step 3: Determine positive ideal and negative idea solution.

$$A^+ = \{V_1^+, V_2^+, \dots, V_n^+\}, \text{ where } V_j^+ = \max_i v_{ij} | j \in J' \quad (6)$$

$$A^- = \{V_1^-, V_2^-, \dots, V_n^-\}, \text{ where } V_j^- = \min_i v_{ij} | j \in J' \quad (7)$$

Step 4: Calculate Euclidean distance from positive ideal solution.

$$S_{i+} = \sqrt{\sum_{j=1}^n (V_{ij} - V_j^+)^2}, i = 1, 2, \dots, m \quad (8)$$

Calculate Euclidean distance from negative ideal solution.

$$S_{i-} = \sqrt{\sum_{j=1}^n (V_{ij} - V_j^-)^2}, i = 1, 2, \dots, m \quad (9)$$

Step 5: Calculate the relative closeness to the idea solution.

$$C_{i+} = \frac{S_{i-}}{(S_{i+} + S_{i-})} \quad (10)$$

The relative closeness is valued between 0 and 1. If the value approaches 1, it means that the alternative will approach the positive idea solution.

Step 6: The alternatives can be ranked according to the descending order of C_{i+} by the most value of C_{i+} is the best alternative.

Pairwise Comparison

This research used weights of the criteria from 3 experts who had relevant experiences with technology and business management, business consultant as well as the selection of tech startup companies. The weights from experts would be used for calculation as the outsider's opinion for the decision maker. The weights were obtained by pairwise comparison technique that was based on Saaty's theory of Analytic Hierarchy Process (AHP). Each criterion will be compared with another criterion, one by one. For each comparison, the criterion

that is the most important will be assigned a score as the intensity of importance in Table 1 to show how much importance it is [3], [16].

Table 1 –Saaty's 1-9 scale of pairwise comparison

Intensity of importance	Definition
1	Equally Preferred
2	Equally to Moderately
3	Moderately Preferred
4	Moderately to Strongly
5	Strongly Preferred
6	Strongly to Very Strongly
7	Very Strongly Preferred
8	Very Strongly to Extremely
9	Extremely Preferred

Subsequently, the comparative matrix can be constructed and will be used to calculate average random consistency further. The comparative matrix, denoted by A, is shown as Equation (11).

$$A = \begin{bmatrix} 1 & a_{12} & a_{13} & \cdots & a_{1n} \\ 1/a_{12} & 1 & a_{23} & \cdots & a_{2n} \\ 1/a_{13} & 1/a_{23} & 1 & \cdots & a_{3n} \\ \vdots & \vdots & \vdots & 1 & \vdots \\ 1/a_{1n} & 1/a_{2n} & 1/a_{3n} & \cdots & 1 \end{bmatrix} \quad (11)$$

For instance, the number of comparisons $N = n(n-1)/2$ by n is the number of criteria used. Following the development of the matrix, priority weights of criteria are calculated through the eigenvalues and eigenvectors as follow [11].

$$\lambda_{max} = \sum_{j=1}^n a_{ij} \frac{w}{w_i} \quad (12)$$

Eigenvector can be calculated by Equation (13).

$$A \times W = \lambda_{max} \times W \quad (13)$$

Where W is eigenvector value that expresses the relative important weight of elements in the same hierarchy. λ_{max} is maximum eigenvector of the comparative matrix. After maximum eigenvector is obtained, the consistency will be checked which inconsistency may give a vague result. In pairwise comparison method, the consistency index (CI) is used to measure inconsistency and consistency ratio (CR) measures the coherence. Therefore, CI and CR can be calculated by Equation (14).

$$CI = \frac{\lambda_{max}-1}{n-1}, \quad CR = \frac{CI}{RI} \quad (14)$$

Where RI is random consistency index that can be obtained by using matrix size to check the value in Table 2.

Table 2 – Random consistency index

Size of Matrix	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

CR is for checking the error that might be occurred from the pairwise comparison, is in the acceptable level or not. For the consistency ratio of the matrix size $n \geq 5$ [16], if the CR is less than or equal to 0.1, the ratio is acceptable. If CR is greater than 0.1, the weighting should be reviewed thoroughly and adjusted until CR is acceptable.

In case of multi decision makers, the matrix of each decision maker will be calculated by using geometric mean as follows.

Assume Matrix A^d is represented matrix A of decision maker d [16].

$$A^d = \begin{bmatrix} 1 & a_{12}^d & \cdots & a_{1n}^d \\ a_{21}^d & 1 & \cdots & a_{2n}^d \\ \vdots & \vdots & 1 & \vdots \\ a_{n1}^d & a_{n2}^d & \cdots & 1 \end{bmatrix} \quad (15)$$

Find an averaged matrix $\bar{A}$ of A^d , $d = \{1, 2, 3, \dots, K\}$.

$$\bar{A} = \begin{bmatrix} 1 & \bar{a}_{12} & \cdots & \bar{a}_{1n} \\ \bar{a}_{21} & 1 & \cdots & \bar{a}_{2n} \\ \vdots & \vdots & 1 & \vdots \\ \bar{a}_{n1} & \bar{a}_{n2} & \cdots & 1 \end{bmatrix} \quad (16)$$

Where $\bar{a}_{ij}$ = geometric mean of set $\{a_{ij}^1, a_{ij}^2, \dots, a_{ij}^K\}$ as Equation (17).

$$\bar{a}_{ij} = \sqrt[K]{a_{ij}^1 \cdot a_{ij}^2 \cdot a_{ij}^3 \cdot \dots \cdot a_{ij}^K} \quad (17)$$

Where K = number of decision makers.

After that, matrix $\bar{A}$ is used to find the weighting matrix (W) including consistency checking by calculation of consistency ratio (CR).

Numerical Analysis

This research has obtained the data of evaluated scores and weights of criterions used in the conceptual idea competition from GISTDA. However, the participant names could not be revealed in this paper, therefore, we would blind participant names by using team1, team2 until team16 to represent them. In this program, there were 16 participants passed the interview stage, unfortunately, team5, team8, and team9 could not attend the competition in the conceptual idea stage. Finally, there were 6 teams for dual use tech group and 7 teams for disaster group respectively. At this stage, there were 7 committees who evaluated the project of each participant by using cardinal score, with respect to each criterion. Seven criterions had been updated by the government agency over the past 3 years which the final criterions and their weights are listed in Table 3.

Table 3 – Criteria used in conceptual idea stage

Criteria	Abbreviation	Weight
Answer to current issue	CR1	0.15
Benefit to dual use tech or disaster	CR2	0.15
Technology feasibility	CR3	0.15
Uniqueness and newness of products & services	CR4	0.15
Business idea	CR5	0.15
Clarity of user groups or customers	CR6	0.15
Profile and experience of entrepreneurship team	CR7	0.1

By another way, we asked 3 experts who have relevant experiences of technology and business management, business consultant as well as the selection of tech startup companies, to score weights of 7 criterions by pairwise comparison method as Equation 11 to 14. The consistency ratio of each expert was 0.093, 0.085 and 0.092 respectively which the ratio was not exceeded 0.1 or meant the weights from experts were consistency and acceptable[16]. Subsequently, the comparative matrices of 3 experts would be combined as Equation 15 to 17 to find the average matrix of 3 experts. Therefore, the results of the pairwise comparison and the average matrix of multiple decision makers (3 experts) are shown in Table 4 as follows.

Table 4 – Weights of experts which are calculated by pairwise comparison

Expert 1

Criteria	CR1	CR2	CR3	CR4	CR5	CR6	CR7
CR1	1.00	1.00	0.50	0.50	3.00	2.00	4.00
CR2	1.00	1.00	1.00	1.00	2.00	1.00	3.00
CR3	2.00	1.00	1.00	3.00	3.00	2.00	1.00
CR4	2.00	1.00	0.33	1.00	3.00	2.00	2.00
CR5	0.33	0.50	0.33	0.33	1.00	2.00	2.00
CR6	0.50	1.00	0.50	0.50	0.50	1.00	2.00
CR7	0.25	0.33	1.00	0.50	0.50	0.50	1.00

C.R. = 0.093

Expert 2

Criteria	CR1	CR2	CR3	CR4	CR5	CR6	CR7
CR1	1.00	1.00	1.00	0.25	0.33	0.25	5.00
CR2	1.00	1.00	3.00	0.33	0.25	0.50	4.00
CR3	1.00	0.33	1.00	0.33	0.25	0.17	1.00
CR4	4.00	3.00	3.00	1.00	0.33	0.33	3.00
CR5	3.00	4.00	4.00	3.00	1.00	3.00	5.00
CR6	4.00	2.00	6.00	3.00	0.33	1.00	6.00
CR7	0.20	0.25	1.00	0.33	0.20	0.17	1.00

C.R. = 0.085

Expert 3

Criteria	CR1	CR2	CR3	CR4	CR5	CR6	CR7
CR1	1.00	0.50	0.50	2.00	1.00	0.50	2.00
CR2	2.00	1.00	2.00	2.00	2.00	0.50	2.00
CR3	2.00	0.50	1.00	1.00	2.00	1.00	2.00
CR4	0.50	0.50	1.00	1.00	1.00	1.00	0.50
CR5	1.00	0.50	0.50	1.00	1.00	2.00	0.50
CR6	2.00	2.00	1.00	1.00	0.50	1.00	2.00
CR7	0.50	0.50	0.50	2.00	2.00	0.50	1.00

C.R. = 0.092

Average

Criteria	CR1	CR2	CR3	CR4	CR5	CR6	CR7
CR1	1.00	0.79	0.63	0.63	1.00	0.63	3.42
CR2	1.26	1.00	1.82	0.87	1.00	0.63	2.88
CR3	1.59	0.55	1.00	1.00	1.14	0.69	1.26
CR4	1.59	1.14	1.00	1.00	1.00	0.87	1.44
CR5	1.00	1.00	0.87	1.00	1.00	2.29	1.71
CR6	1.59	1.59	1.44	1.14	0.44	1.00	2.88
CR7	0.29	0.35	0.79	0.69	0.58	0.35	1.00
Total	8.31	6.42	7.56	6.34	6.17	6.46	14.60

Normalized

Criteria	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Total	Weight
CR1	0.12	0.12	0.08	0.10	0.16	0.10	0.23	0.92	0.31
CR2	0.15	0.16	0.24	0.14	0.16	0.10	0.20	1.14	0.38
CR3	0.19	0.09	0.13	0.16	0.19	0.11	0.09	0.95	0.32
CR4	0.19	0.18	0.13	0.16	0.16	0.14	0.10	1.06	0.35
CR5	0.12	0.16	0.12	0.16	0.16	0.35	0.12	1.18	0.39
CR6	0.19	0.25	0.19	0.18	0.07	0.15	0.20	1.23	0.41
CR7	0.04	0.05	0.11	0.11	0.09	0.05	0.07	0.52	0.17

Table 5 – Results of MCDM approaches for the group of dual use tech

Dual Use Tech

Averaged scores from committees' evaluation

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Total
Team1	8.43	8.57	8.29	9.14	7.86	8.43	5.71	56.43
Team2	11.43	11.57	10.86	11.14	10.00	10.71	7.86	73.57
Team3	12.43	12.86	12.29	13.00	11.29	11.57	8.00	81.43
Team4	11.43	11.43	11.43	11.29	10.57	11.00	7.86	75.00
Team6	10.86	10.43	10.57	10.29	9.71	10.29	7.43	69.57
Team7	9.86	9.86	9.14	10.29	8.71	9.00	6.71	63.57

Weight sum method with the government agent's weights

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Total	Rank
Team1	1.26	1.29	1.24	1.37	1.18	1.26	0.57	8.18	6
Team2	1.71	1.74	1.63	1.67	1.50	1.61	0.79	10.64	3
Team3	1.86	1.93	1.84	1.95	1.69	1.74	0.80	11.81	1
Team4	1.71	1.71	1.71	1.69	1.59	1.65	0.79	10.86	2
Team6	1.63	1.56	1.59	1.54	1.46	1.54	0.74	10.06	4
Team7	1.48	1.48	1.37	1.54	1.31	1.35	0.67	9.20	5

Weight sum method with the expert's weights

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Total	Rank
Team1	2.59	3.26	2.61	3.22	3.10	3.46	0.99	19.23	6
Team2	3.51	4.41	3.42	3.92	3.94	4.40	1.36	24.96	3
Team3	3.81	4.90	3.87	4.57	4.45	4.75	1.39	27.75	1
Team4	3.51	4.35	3.60	3.97	4.17	4.52	1.36	25.48	2
Team6	3.33	3.97	3.33	3.62	3.83	4.23	1.29	23.60	4
Team7	3.02	3.75	2.88	3.62	3.44	3.70	1.16	21.58	5

TOPSIS Technique with Government Agent's Weights

Normalized decision matrix

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7
Team1	0.32	0.32	0.32	0.34	0.33	0.34	0.319
Team2	0.43	0.43	0.42	0.42	0.42	0.43	0.439
Team3	0.47	0.48	0.48	0.49	0.47	0.46	0.447
Team4	0.43	0.43	0.44	0.42	0.44	0.44	0.439
Team6	0.41	0.39	0.41	0.38	0.41	0.41	0.415
Team7	0.37	0.37	0.35	0.38	0.36	0.36	0.375

TOPSIS Technique with Expert's Weights

Normalized decision matrix

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7
Team1	0.32	0.32	0.32	0.34	0.33	0.34	0.32
Team2	0.43	0.43	0.42	0.42	0.42	0.43	0.44
Team3	0.47	0.48	0.48	0.49	0.47	0.46	0.45
Team4	0.43	0.43	0.44	0.42	0.44	0.44	0.44
Team6	0.41	0.39	0.41	0.38	0.41	0.41	0.42
Team7	0.37	0.37	0.35	0.38	0.36	0.36	0.38

Weighted normalized decision matrix and TOPSIS calculation

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Si+	Si-	Pi	Rank
Team1	0.048	0.048	0.048	0.051	0.049	0.050	0.032	0.056	0.000	0.000	6
Team2	0.065	0.065	0.063	0.062	0.063	0.064	0.044	0.019	0.038	0.668	3
Team3	0.070	0.072	0.072	0.073	0.071	0.069	0.045	0.000	0.056	1.000	1
Team4	0.065	0.064	0.067	0.063	0.066	0.066	0.044	0.016	0.041	0.724	2
Team6	0.061	0.059	0.062	0.058	0.061	0.062	0.042	0.028	0.029	0.516	4
Team7	0.056	0.056	0.053	0.058	0.055	0.054	0.038	0.040	0.016	0.285	5
V+	0.070	0.07	0.07	0.07	0.07	0.07	0.07	0.04			
V-	0.05	0.05	0.05	0.05	0.05	0.05	0.03				

Weighted normalized decision matrix and TOPSIS calculation

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Si+	Si-	Pi	Rank
Team1	0.098	0.123	0.101	0.120	0.130	0.138	0.055	0.131	0.000	0.000	6
Team2	0.132	0.165	0.133	0.147	0.165	0.176	0.076	0.045	0.088	0.663	3
Team3	0.144	0.184	0.150	0.171	0.186	0.190	0.078	0.000	0.131	1.000	1
Team4	0.132	0.163	0.140	0.148	0.174	0.180	0.076	0.037	0.097	0.721	2
Team6	0.126	0.149	0.129	0.135	0.160	0.169	0.072	0.066	0.068	0.507	4
Team7	0.114	0.141	0.112	0.135	0.144	0.148	0.065	0.096	0.036	0.275	5
V+	0.144	0.184	0.150	0.171	0.186	0.190	0.078				
V-	0.098	0.123	0.101	0.120	0.130	0.138	0.055				

SAW Technique with Government Agent's Weights

Normalized decision matrix

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Pi	Rank
Team1	0.678	0.667	0.674	0.703	0.696	0.728	0.714	0.693	6
Team2	0.920	0.900	0.884	0.857	0.886	0.926	0.982	0.904	3
Team3	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
Team4	0.920	0.889	0.930	0.868	0.937	0.951	0.982	0.922	2
Team6	0.874	0.811	0.860	0.791	0.861	0.889	0.929	0.856	4
Team7	0.793	0.767	0.744	0.791	0.772	0.778	0.839	0.781	5

SAW Technique with Expert's Weights

Normalized decision matrix

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Pi	Rank
Team1	0.678	0.667	0.674	0.703	0.696	0.728	0.714	1.620	6
Team2	0.920	0.900	0.884	0.857	0.886	0.926	0.982	2.105	3
Team3	1.000	1.000	1.000	1.000	1.000	1.000	1.000	2.333	1
Team4	0.920	0.889	0.930	0.868	0.937	0.951	0.982	2.150	2
Team6	0.874	0.811	0.860	0.791	0.861	0.889	0.929	1.992	4
Team7	0.793	0.767	0.744	0.791	0.772	0.778	0.839	1.818	5

Ranking of Dual Use Tech Group

Participant	Committee	Weighting by Government Agent			Weighting by Expert			Competition Result
		Weight Sum	TOPSIS	SAW	Weight Sum	TOPSIS	SAW	
Team1	6	6	6	6	6	6	6	Not Qualified
Team2	3	3	3	3	3	3	3	Qualified
Team3	1	1	1	1	1	1	1	Qualified
Team4	2	2	2	2	2	2	2	Qualified
Team6	4	4	4	4	4	4	4	Qualified
Team7	5	5	5	5	5	5	5	Not Qualified

Table 6 – Results of MCDM approaches for the group of disaster tech

Disaster Tech Group

Averaged scores from committees' evaluation

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Total
Team10	9.57	9.57	9.86	8.71	9.43	9.14	6.71	63.00
Team11	11.43	11.57	10.86	12.43	10.57	11.00	8.29	76.14
Team12	9.86	10.00	10.00	10.00	9.29	9.43	7.00	65.57
Team13	11.29	11.00	11.14	10.57	10.14	9.86	8.00	72.00
Team14	11.71	11.71	11.57	12.14	10.71	10.71	7.86	76.43
Team15	9.71	9.57	10.00	9.00	9.71	9.86	7.29	65.14
Team16	11.00	11.43	11.00	10.57	11.29	11.57	8.29	75.14

Weight sum method with the government agent's weights

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Total	Rank
Team10	1.44	1.44	1.48	1.31	1.41	1.37	0.67	9.11	7
Team11	1.71	1.74	1.63	1.86	1.59	1.65	0.83	11.01	2
Team12	1.48	1.50	1.50	1.50	1.39	1.41	0.70	9.49	5
Team13	1.69	1.65	1.67	1.59	1.52	1.48	0.80	10.40	4
Team14	1.76	1.76	1.74	1.82	1.61	1.61	0.79	11.07	1
Team15	1.46	1.44	1.50	1.35	1.46	1.48	0.73	9.41	6
Team16	1.65	1.71	1.65	1.59	1.69	1.74	0.83	10.86	3

TOPSIS Technique with Government Agent's Weights

Normalized decision matrix

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7
Team10	0.339	0.337	0.350	0.312	0.350	0.337	0.332
Team11	0.404	0.408	0.385	0.444	0.392	0.405	0.409
Team12	0.349	0.352	0.355	0.358	0.345	0.347	0.346
Team13	0.399	0.387	0.395	0.378	0.376	0.363	0.395
Team14	0.414	0.413	0.411	0.434	0.398	0.395	0.388
Team15	0.344	0.337	0.355	0.322	0.360	0.363	0.360
Team16	0.389	0.403	0.390	0.378	0.419	0.426	0.409

Weighted normalized decision matrix and TOPSIS calculation

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Si+	Si-	Pi	Rank
Team10	0.051	0.051	0.052	0.047	0.052	0.051	0.033	0.033	0.001	0.024	7
Team11	0.061	0.061	0.058	0.067	0.059	0.061	0.041	0.007	0.029	0.816	2
Team12	0.052	0.053	0.053	0.054	0.052	0.052	0.035	0.027	0.008	0.224	5
Team13	0.060	0.058	0.059	0.057	0.056	0.054	0.039	0.016	0.019	0.544	4
Team14	0.062	0.062	0.062	0.065	0.060	0.059	0.039	0.006	0.029	0.823	1
Team15	0.052	0.051	0.053	0.048	0.054	0.054	0.036	0.029	0.006	0.165	6
Team16	0.058	0.060	0.059	0.057	0.063	0.064	0.041	0.011	0.026	0.696	3
V+	0.062	0.062	0.062	0.067	0.063	0.064	0.041				
V-	0.051	0.051	0.052	0.047	0.052	0.051	0.033				

SAW Technique with Government Agent's Weights

Normalized decision matrix

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Pi	Rank
Team10	0.817	0.817	0.852	0.701	0.835	0.790	0.810	0.803	7
Team11	0.976	0.988	0.938	1.000	0.937	0.951	1.000	0.968	2
Team12	0.841	0.854	0.864	0.805	0.823	0.815	0.845	0.835	5
Team13	0.963	0.939	0.963	0.851	0.899	0.852	0.966	0.917	4
Team14	1.000	1.000	1.000	0.977	0.949	0.926	0.948	0.973	1
Team15	0.829	0.838	0.864	0.724	0.861	0.852	0.879	0.833	6
Team16	0.939	1.000	0.951	0.851	1.000	1.000	1.000	0.961	3

Weight sum method with the expert's weights

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Total	Rank
Team1	2.94	3.65	3.11	3.07	3.72	3.76	1.16	21.39	7
Team2	3.51	4.41	3.42	4.37	4.17	4.52	1.44	25.83	2
Team3	3.02	3.81	3.15	3.52	3.66	3.87	1.21	22.25	5
Team4	3.46	4.19	3.51	3.72	4.00	4.05	1.39	24.32	4
Team6	3.59	4.46	3.65	4.27	4.22	4.40	1.36	25.96	1
Team7	2.98	3.65	3.15	3.17	3.83	4.05	1.26	22.09	6
Team8	3.37	4.35	3.47	3.72	4.45	4.75	1.44	25.56	3

TOPSIS Technique with Expert's Weights

Normalized decision matrix

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7
Team10	0.339	0.337	0.350	0.312	0.350	0.337	0.332
Team11	0.404	0.408	0.385	0.444	0.392	0.405	0.409
Team12	0.349	0.352	0.355	0.358	0.345	0.347	0.346
Team13	0.399	0.387	0.395	0.378	0.376	0.363	0.395
Team14	0.414	0.413	0.411	0.434	0.398	0.395	0.388
Team15	0.344	0.337	0.355	0.322	0.360	0.363	0.360
Team16	0.389	0.403	0.390	0.378	0.419	0.426	0.409

Weighted normalized decision matrix and TOPSIS calculation

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Si+	Si-	Pi	Rank
Team10	0.104	0.128	0.110	0.110	0.138	0.138	0.058	0.079	0.002	0.026	7
Team11	0.124	0.155	0.121	0.156	0.155	0.167	0.071	0.016	0.069	0.810	1
Team12	0.107	0.134	0.112	0.126	0.136	0.143	0.060	0.065	0.018	0.219	5
Team13	0.122	0.148	0.125	0.133	0.148	0.149	0.069	0.041	0.043	0.516	4
Team14	0.127	0.157	0.129	0.153	0.157	0.162	0.067	0.016	0.069	0.808	2
Team15	0.105	0.128	0.112	0.113	0.142	0.149	0.062	0.069	0.014	0.170	6
Team16	0.119	0.153	0.123	0.133	0.165	0.175	0.071	0.026	0.063	0.710	3
V+	0.127	0.157	0.129	0.156	0.165	0.175	0.071				
V-	0.104	0.128	0.110	0.110	0.136	0.138	0.058				

SAW Technique with Expert's Weights

Normalized decision matrix

Participant	CR1	CR2	CR3	CR4	CR5	CR6	CR7	Pi	Rank
Team10	0.817	0.817	0.852	0.701	0.835	0.790	0.810	1.872	7
Team11	0.976	0.988	0.938	1.000	0.937	0.951	1.000	2.257	2
Team12	0.841	0.854	0.864	0.805	0.823	0.815	0.845	1.945	5
Team13	0.963	0.939	0.963	0.851	0.899	0.852	0.966	2.128	4
Team14	1.000	1.000	1.000	0.977	0.949	0.926	0.948	2.266	1
Team15	0.829	0.838	0.864	0.724	0.861	0.852	0.879	1.943	6
Team16	0.939	1.000	0.951	0.851	1.000	1.000	1.000	2.246	3

Ranking of Disaster Tech Group

Participant	Committee	Weighting by Government Agent			Weighting by Expert			Competition Result
		Weight Sum	TOPSIS	SAW	Weight Sum	TOPSIS	SAW	
Team10	7	7	7	7	7	7	7	Not Qualified
Team11	2	2	2	2	2	1	2	Qualified
Team12	5	5	5	5	5	5	5	Qualified
Team13	4	4	4	4	4	4	4	Qualified
Team14	1	1	1	1	1	2	1	Qualified
Team15	6	6	6	6	6	6	6	Not Qualified
Team16	3	3	3	3	3	3	3	Qualified

From comparing the weights of both types, it was found that the weights of the government agent were 0.15 from criteria CR1 to CR6 but criteria CR7 was 0.1 only, while the weights of experts were 0.31, 0.38, 0.32, 0.35, 0.39, 0.41 and 0.17 respectively. It could be seen that the experts would mostly focus on the criteria of clarity of user group and customer which meant the participants or startup companies should evidently know who their customers are. In another case, the experts less focused on the profile and experiences of the entrepreneurship team that was the same as the government agent's point of view. On the other side, the government agent equally focused on the importance of the answer to the current issue, benefit to dual use tech or disaster, technology feasibility, uniqueness and newness of products & services, business idea and clarity of user groups or customers.

From the data of evaluation scores, the data of both dual use tech and disaster tech groups have proceeded as the research framework in Figure 1. The results of three MCDM approaches for dual use tech group were shown in Table 5 and disaster tech group was in Table 6. With the result of dual use tech group, both ranking obtained by weights of the government agent and experts also identified the same direction that Team1 and Team7 were not qualified to the next round. When the rankings of each approach and source of weight were compared and found that all approaches identically ranked participants of the competition with committees' ranking.

For the result of the disaster tech group, it was found that the rankings obtained by weights of the government agent identified Team10 and Team15 were not qualified to the next round, while the ranking obtained by weights of experts identified the same team. However, the ranking of TOPSIS was calculated by weights of experts had two different points which were ranking of Team11 was number one and Team14 was number two, but other approaches reversely had ranking for Team11 and Team14 and were consistent with committee ranking. The reason was the experts weighted criteria 4 and 6 with high scores at 0.35 and 0.41 respectively and Team11 was obtained the evaluated scores for both criterions higher than Team14. However, the final scores of both teams were only different at 0.002 points. For qualified teams to the next round, the rankings obtained by weights of experts still identified Team10

and Team15 were not qualified to the next round which consistently had the results with the ranking obtained by weights of the government agent.

Discussion and Limitation

The research question of this paper is what the MCDM approach selected is most accurate for the decision-making process of a Thai government agent to select potential technological startup companies to provide funding. To answer the research question, the results of the MCDM approaches will be compared with the results of committees' decision in the UAV Startup 2019 program to find which MCDM approach can produce the results as close as the results in the program. By obtained data from the government agent, the results of the weight sum method, SAW and TOPSIS for groups of dual use tech and disaster tech were identical as the results of committees' decision. In contrast to the results from the weights of experts, the result of TOPSIS from disaster tech group, which was influenced by weights of experts, was different from others. This incident caused the scores of the teams that had different results to be reviewed once more. This action was consistent with the objective of using weights of experts was the outsider's opinion or reference to support the committees' decision in this research. These different results influenced the committees to review the teams' performances from the video recorder. If the committee agreed with the outsider's opinion, therefore, they could rely on the results from the weights of experts. However, if the committees confirmed in their decision, they could internal discuss and find the consensus for making the final decision.

Due to the reliability and accuracy of results are emphasized in this paper but the weights of GISTDA did have an indicator to identify its reliability. Therefore, the results of committees might not build trust to other people that their results were accurate. Whilst the weights of experts had reliability more than the weight of the government agent because they were calculated by pairwise comparison technique. The reliability of the weight could be indicated by the consistency ratio that expressed the consistency of the judgment [3], [16] and these weights got scored by comparing pairs of criterions which were a reasonable method [19]. Basically, inconsistency may lead to vague and incorrect results [11], therefore, the consistency ratio of the comparative matrix should not exceed 0.1 [3], [16], [19]. With this technique, the weights of experts were obtained from their comparative matrices with their ratios were 0.093, 0.085 and 0.092 respectively and these numbers were acceptable.

Therefore, the results calculated by using the weights of experts will be more reliable and accurate than the results calculated by the weights of the government agent. For this research, the results from the weights of experts can be the reference for committees to express the reliability and accuracy of their results to others such as participants in the program.

In the part of the results of each approach, there was a difference from TOPSIS approach in disaster group that was influenced by the weights of experts. With the advantages of TOPSIS approach, TOPSIS approach basically finds the best alternative by identifying the position of the best solution from positive and negative idea solution which the position should be close to the positive idea solution and far from the negative idea solution [12], [17], [19]. In contrast, SAW approach is typically considered and emphasized on positive and negative criteria [3], [12], [15] that is a rough calculation when it is compared with TOPSIS [19]. Furthermore, the disadvantage of SAW approach is it normally produces exaggerated results [19]. With the above reasons, SAW approach is most appropriate for starters who would like to use rough calculation for problems in MCDM. While the problem of government agency's investment decision is required high accuracy approaches which TOPSIS is the most appropriate MCDM approach for this problem.

From the observation of research in the competition, all the criteria in this competition were required quality score, not crisp numbers that were used to evaluate participants. The research found that most criteria were difficultly scored as the crisp number or cardinal score. This could be seen the same criteria could be more differently scored by decision makers. Some decision makers scored a low number while another decision maker scored a high number in the same criteria. This difference of scoring can influence to decision makers evaluate alternatives inefficiently. Therefore, the linguistic variable should be used to evaluate startup companies that are matched to quality data which is vague and subjective [2], [17], [18]. The linguistic variable can support decision makers to improve their evaluation alternatives more efficiently. As the criteria of the government agent, the weights of those criteria were scored as a non-preemptive type which the weighting value of each criterion is related to the importance of that criterion. However, the weights which are scored by non-preemptive cannot indicate or measure the reliability of the weight. In contrast, the weights obtained by the pairwise method can be measured reliability by using the consistency ratio. In

academic or research, the weights from this technique are as acceptable as weights scored as non-preemptive type. Finally, this research was studied in the context of GISTDA's decision making process in the UAV startup 2019 program and particularly scoped to the competition in the conceptual idea stage. Therefore, weights used for numeric analysis do not cover weights used in the decision-making process for the selection of technological startup companies to provide funding that is the final stage of this program.

Summary

In developing countries, the government typically supports funding technological SMEs or startup companies through government agencies in the countries. The funds of this channel become an important source of fund for technological startup companies in the seed stage because they easier raise funds from this source than others such as venture capitalists, angel investors or banks. The government agencies do not expect the return on investment in terms of money but they expect the funded venture can survive and grow in the business world as well as generate incomes to drive the economy in the country. However, government agencies cannot sufficiently provide funding to all startup companies in the country because the number of startup companies is increasing and budgets supported by the government are limited in each year. Therefore, government agencies should improve their decision-making process to select appropriate startup companies for their investment more efficiently.

This paper has proposed 3 MCDM approaches which are the weight sum method, SAW, and TOPSIS to find what the approach can solve the problem of the government agency's decision-making process and has results to resemble the committees' decision. From the experiment with GISTDA's data and criteria in the competition of the conceptual idea stage, all MCDM approaches could rank the participants as the same as the committees' ranking. However, when the weights of experts were used in this experiment, the results of TOPSIS from the disaster tech group differed from results of other approaches and committees' results because the weighting method of experts was used the pairwise comparison technique. In contrast, the weight of each criterion of the agency was from their experiences that could not be measured the reliability of the weights. Therefore, this weights of the government agency may lead to vague and inaccurate decision results. To ensure the committees' decision is reliable, the results of MCDM approaches from the weights of experts will be the reference of committees' decision

results to express the reliability and accuracy of their decision. In terms of application, TOPSIS is the most appropriate method for the problem of the government agency's decision-making process because of TOPSIS basically selects the best alternative that is most close to the positive idea solution and most far from the negative idea solution. Whilst, SAW is typically used by starters for the rough calculation and it generally produces exaggerated results. Finally this research was experimented under GISTDA's context and the approaches used in this research may produce a different results from the results in this paper in other contexts. Therefore, other MCDM approaches should be considered to apply to the context appropriately.

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AHP Analysis of Factors Related to the Succession of Family Business : From the View of Successor

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Abstract

Family business is a necessary part of each country. In Korea, almost 70% of enterprises are predicted as a family business and they have crucial impacts to national stability and employment. This study investigated family business, especially, focusing succession from the view of successors. We used AHP method for defining the priorities of factors affecting succession. The results of this study, successors selected interpersonal management ability, business competence and finance plan as 1st, 2nd, and 3rd. They are also seen not to consider the psychological factors of a succeesee. Using this result for making successful guidelines of succession would be needed.

Keywords

Family business, Successor, Succession, AHP, Priority

1. Introduction

Family business is the most common type of corporations worldwide, and plays an important role both economically and socially in each country. The study of the role of family members as an important factor influencing the stability and productivity of firms has been found to attract the attention of many scholars since the 1980s (Kim, 1999). There is a study of the proportion of family businesses in the world, ranging from 80% to 98%, depending on the definition (Poza, 2010). In particular, according to the results of research conducted in nine East Asian countries, more than two-thirds of companies are family businesses (Classens et al, 2000).

These family businesses have a great impact on the national economy as well as on the total corporate share. According to the Korea Chamber of Commerce and Industry (KCCI), family business is accounted for about 70% of the total assets and about 67% of employment contribution.

Despite the fact that family business plays a pivotal role

in various fields, academic research and interest are not so high. The absence of the theory and research about the family business have negative effects on the development and succession of the family business, also these become a big problem for the survival of the family business. In particular, this is due to a significant lack of research into succession that can be considered by many family businesses to determine the sustainability of family business, many companies experience a failure to succeed.

According to Ward (1987), the percentage of companies succeeding in succession from first generation to second generation is about 30%, and the percentage of successful succession from second to third generation falls sharply to 13%.

In Korea, there is previous research of the successors' priorities of factors for the effects of succession (Yu et al., 2019). However, there is a complexity to study the succession, which requires consideration of different stakeholder perspectives in different situations (Choo, 2019).

This study focuses on the succession process, which is the crucial event of the family business and the important issue that must be solved when family members consider to give business to the next generation. In particular, we analyzed the priorities of factors influencing succession from the viewpoint of the successor who is the key person of succession. The first tier, which is the top tier, was selected as a total of four factors. The first tier was further subdivided into three factors as the second tier. We used the AHP methodology, one of the ways to identify the priority in the decision-making process. The four factors of the first tier and the 12 factors of the second tier were weighted, and calculated the final weight by multiplying the first tier and each second tier. The purpose of this study is as follows. In fact, by analyzing the priorities of successors from the viewpoint of the successor who determines all matters of succession, this study provides information to a successor which is important factors that should be prepared. In addition, providing information, this study helps family members for successful succession.

2. Definition of Family Business

Family business is defined in various ways such as family business, family firm, family enterprise etc. (Lee, 2016). According to many previous studies, family business can be defined according to various criteria, such as decision making right, ownership right, and management right.

Churchill & Hatten(1997) argued that a business should be started by a family member, that the ownership belongs to family members, and that ownership should be succeeded to the next generation. Instead of the existing definition focusing only on ownership, Handler (1994) defined the family business in consideration of ownership, generation transfer, and various other environmental conditions. Tsang (2002) presented two criteria for defining family businesses. The criteria is that the intention of the family based on the strategic based the structure and family participation in the ownership and management of the family business.

Westhead et al. (1998) proposed four family business standards. First, family members must own at least 50% of the ownership of the family business. Second, family members of relatives should regard the business as a family business. Third, the business must be managed by family members of a single dominant family. Fourth, family members who own a family business should experience a succession among generations. (Westhead

et al., 2002), They argued that family business should be defined the basis of these various criteria rather than simply defining as ownership or control.

Shanker and Astrachan (1996) defined family business, according to three criteria. A Broad concept is a business that family members do not participate in the business but gave a strategic direction. Middle concept is meant that a founder of family business only participates in the business. A Narrow concept is presented family members over 2 generations participate in the business.

In addition, family business is defined as a company which has a plan to succeed to the next generation of family members or already experienced succession. This means that the company has a clear purpose for sustainability of the business (Rho et al., 2007).

In this study, we used a middle concept from Shanker & Astrachan defined a family business, which means that only the first generation participates in business and the family members has the ownership.

2.1 Succession of Family Business

In Korea, companies, through industrialization in the 60s to 70s, are preparing for the retirement of the first generation of the business, and planning the succession to the second or third generation. In particular, Small and medium companies are increasingly interested in the succession of their businesses, because the succession is the crucial problem which decides their future (Lee, 2009).

There is a slight difference about the definition of the succession depending on the criteria or scholars. In family business, succession means the process of transferring ownership and management rights from the founder to the second generation (Shin, 1992). Also, there are a definition in the narrow meaning and a definition in the broad meaning.

Ward(1987) defined the succession of a family business which is defined as a company that inherits the management and ownership rights from the first, second or more-generation households.

Churchill & Hatten(1997) contended that succession was old generations succeeded management and ownership rights to young generation. They also included a company which expected to happen succession as a family business.

The important commonalities of the definition of succession in the family business can be summarized by what kind of efforts the family members are currently doing to maintain the sustainability of the business

Succession in this family business has many pros and cons. The biggest disadvantage is the family member dispute pointed out by Ibrahim et al (1994). They indicated human resources excluded the ability of members and a disagreement due to wrong succession plan. Ward (1987) also pointed out that the family could be a serious obstacle for the company.

However, despite these disadvantages, family business wants to succeed successful, because there are many advantages. According to The Korea Economic Daily of Small and Medium Research Lab (2006), Family business has a management secret method that has been passed down since the establishment of the company, and they can develop a business management method by inheriting management rights from the first generation to next. Also, many executives have great loyalty and responsibility, and they can make decisions quickly. Surviving company by overcoming many trials for a long time, it is advantageous to adapt to consumer demand and change environment, and it emphasizes that it is the foundation to survive as a longevity business. However, previous studies have emphasized that succession is not an easy task, because succession through generations requires the ability to manage complex and highly emotional processes (Magreta, 1998).

2.2 Operational definition of used variables

In this study, a total of 2 tiers were used for AHP analysis. In the case of the first tier of the hierarchy, the relationship between a successor and a succeesee, succeesee's management ability, succeesee's self-efficacy, and succession plan were set. Each of the first tier factors has sub-factors as the second tier. The second tier consists of a total of 12 factors.

2.2.1 The relationship between a successor and a succeesee

There are many members related to succession in the family business, but the most important members are a successor and a succeesee. A good relationship between these two members is a necessary factor, and there are many results of previous research that this relationship affects succession. Generally, the successor is in a position

to make a crucial decision about succession as well as managing the control and ownership of the current family business (Kim et al., 2011). This means that the successor has the authority to choose the succeesee. Therefore, if there is a positive relationship between them, it is highly likely that the successor will be selected and succession proceed smoothly. Table 1 shows the second tier factors.

<Table 1> Sub factors in relationship with a succeesee

2 tier sub factors	Previous research
Level of mutual trust	Kim et al., 2013, Back et al., 2017
Sharing vision of the company	Hwang et al., 2013, Kim et al., 2013
Communication	Song et al., 2017, Morris et al, 1997, Shin, 2013

2.2.2 Managerial ability of a succeesee

The succeesee's managerial ability could be said to be one of the most important factors influencing succession. Especially, when the successor selects the succeesee, the succeesee's management ability could be an important criterion. It also has a significant effect on the performance of the company during the succession process or after the succession has ended. Therefore, the succeesee's managerial ability could be presented a crucial factor influencing not only successor selection criteria, but also the future of the company. <Table 2> shows the factors of the 2 tier level of succeesee's management ability.

<Table 2> Sub factors in a succeesee's managerial ability

2 tier sub factors	Previous research
Business competence	Morris et al., 1997, Kang et al., 2009
Education and training	Kim et al., 2016, Hwang, 2008
Interpersonal management ability	Nam, 2005, Kim, 2016

2.2.3 Self-efficacy of a succeesee

The self-efficacy from the social learning theory of Bandura (1982) is a term that expresses a positive psychological state, meaning that the individual can successfully finish personal job and positively influence

the performance of the organization. It can be defined not only as a personal condition, but also as a psychological mechanism that can affect an organization's performance.

The importance of self - efficacy was found in many previous researches, and it was shown that the successee's self-efficacy influenced succession preparation satisfaction of the successee (Namjae Cho et al., 2018). The factors of the successee's self-efficacy in the second tier are shown in Table 3.

<Table 3> Sub factors in successee's self-efficacy

2 tier sub factors	Previous research
Willingness of succession	Venter et al., 2005, Chung et al., 2016
Confidence of overcoming crisis	Hwang 2012
Confidence of achieving objectives	Suh 2015, Lim et al., 2016, Hwang 2012

2.2.4 Succession plan

Succession in a family business is the most important event and must be solved. In the case of a non-family business, succession ends at the same time as the succeeding management rights. On the other hand, for For family businesses, succession takes a considerable amount of time and effort from preparation to the end of the succession. This means that a long-term plan and preparation of succession are necessary for successful succession. The plan in various areas is also needed, and many members related to the family and business should be included in the plan. Table 4 defined the second tier factors of the succession plan.

<Table 4> Sub factors in succession plan

2 tier sub factors	Previous research
Finance plan	Morris et al., 1997, Song 2014, Hwang 2008
Leadership transformation plan	Cho 2012, Nam 2013, Hwang 2012
Human-organization management plan	Kim et al., 2018

3. Research Method

3.1 Analytic Hierarchy Process (AHP)

The Analytic Hierarchy Process (AHP) was developed in 1970s to make efficient decision-making within the US Department of State's Department of State. This method, developed by Thomas L. Satty, classifies various mutually exclusive factors into the top tier, and sets up a lower tier belonging to the top tier again. And it is a decision-support technique that draws final weight through Pairwise Comparison and prioritizes among the final factors.

AHP analysis methods can become more difficult or impossible to analyze as the number of tiers and alternatives increases. In addition, if the hierarchy and factors set at the beginning of the decision are erroneously set, there is a problem that not only the detailed decision but also the overall decision may be wrong. Despite these drawbacks, AHP has the advantage of being able to see the relative importance and logical consistency by making each tier of factors and pair comparisons. When a family makes decisions, the family can make numerical final judgments through features that are intuitive, easily understandable, and weighted by factors instead of complex, many criteria.

The AHP analysis method is conducted through five processes. First, layering is established by setting the top-tier factors and the lower-tier factors associated with each top-tier factor as a decision-tiering step. When making tiers are important, the factors that make up the hierarchy must be mutually exclusive (Shin et al., 2016)

Second, a pairwise comparison is made between the factors after setting the stratification. Through the questionnaire, each factor is compared one by one and weights are determined. In general, the survey is based on the 9-point scale.

Third, it is the process of calculating the relative weights of the decision makers after the questionnaire. The number of rows and columns is set equal to the number of factors, a square matrix is formed, and a weight is calculated. In this process, it is common to derive the results using the AHP's unique method.

Fourth, it measures the consistency ratio of survey results. Consistency rate means the Consistency Index (CI) divided by the Random Indices (RI) value. The consistency ratio is judged that there is a reasonable coherence, if the final score is less than 0.1 in conducting research. Even if it is

less than 0.2, it is judged that it has consistency level to be tolerated. However, if it is more than 0.2, it is judged that consistency is insufficient, and recommend to conduct the survey again(Satty, 1980).

Finally, the final result is obtained by summing or multiplying the weights by each hierarchy. In this step, researchers usually use the simple additive weighting method, which is prioritized in order of the factor with the highest rating. This allows the decision maker to choose the optimal alternative and the researcher can compare and analyze the importance of each factor.

<Table 5> Factors affecting the succession in each tier

Tier	Factor 1	Factor 2	Factor 3	Factor 4
Tier 1	Relationship with a succeesee	Succeesee's managerial ability	Succeesee's self-efficacy	Succession plan
Tier 2	Level of mutual trust	Business competence	Willingness of succession	Finance plan
	Sharing vision of the company	Education and training	Confidence of overcoming crisis	Leadership transformation plan
	Communication	Interpersonal management ability	Confidence of achieving objectives	Human-organization management plan

4. Results

4.1 Sample analysis

For the purpose of this study, the survey was conducted by limiting the respondents to successors in family businesses. A total of 40 questionnaires were collected through on-line and off-line surveys (Table 6).

According to the gender of the total respondents, men were 34 and women were 6. The rate of gender was men 85% and women 14%. Successors considered men 36 (90%) and women 4 (10%) for next C.E.O.. The gender of the succeesee was overwhelmingly male. In addition, Successors contemplated their children 36 (90%) and professional managers 4 (10%). In the case of relatives and employees, the successor did not consider.

The age of successor was respectively that under 40 was 4 (10%), 46~50 was 4 (10%), 51~55 was 7 (17.5), 56~60 was 8 (20%) and over 60 was 17 (42.5%).

The rate of over 56 age was over 60% and it could be meant that the majority of the companies participating in the study had to prepare retirement and succession.

Among the successors who participated in the study, the percentage of those who are preparing for the succession is 72.5% (29), 29.5%, the successor in succession was 22.5% (9), and 2 (5%) successors were none.

By industry, the manufacturing sector accounted for 45% (18) of the total. The construction industry accounted for 12.5% (5), the distribution industry accounted for 12.5% (5), the service industry accounted for 20% (8), the financial industry accounted for 5% (2), the agriculture accounted for 2.5% (1) and the other accounted for 2.5% (1).

The successor's working period accounted for less than 10 for 2 (5%), 10~15 years for 5 (12.5%), 15~20 years for 10 (25%), 20~25 years for 4 (10%) and over 25 for 19 (47.5%).

<Table 6> The result of sample analysis

Division	Category	Frequency	Ratio (%)	Total
Gender	Male	34	85%	40
	Female	6	15%	
Succeesee's gender	Male	36	90%	40
	Female	4	10%	
Succession object	Children	36	90%	40
	Relative	0	0%	
	Professional manager	4	10%	
	In-company staff	0	0%	
	Other	0	0%	
Age	Under 45	4	10%	40
	46 ~ 50 age	4	10%	
	51 ~ 55 age	7	17.5%	
	56 ~ 60 age	8	20%	
	over 60	17	42.5%	
Succession circumstances	Preparing succession	29	72.5%	40
	In succession	9	22.5%	
	Completed succession	0	0%	
	None	2	5%	
Industry	Manufacturing	18	45%	40
	Construction	5	12.5%	
	Distribution	5	12.5%	
	Service	8	20%	
	Financial	2	5%	
	Agriculture	1	2.5%	
	Other	1	2.5%	
Working period	Less than 10	2	5%	40
	10 ~ 15 years	5	12.5%	
	16 ~ 20 years	10	25%	
	21 ~ 25 years	4	10%	
	over 25 years	19	47.5%	

4.2 The result of the first tier priorities

We set up the first tier with 4 factors, the relationship with a successee, a successee's managerial ability, a successee's self-efficacy and succession plan. The importance of each factor was as follows. The relationship with a successee was 0.2195, successee's managerial ability was 0.4188, successee's self-efficacy was 0.1503, and succession plan was 0.2114. The priorities to successors, they considered successee's managerial ability as the first. The second was the relationship with a successor, the third was succession plan and the fourth was successee's self-efficacy. The result of C.R. was appropriate, 0.1574 which was lower than 0.2 (Table 7).

<Table 7> Result of tier 1

Factor	relationship with a successee	successee's managerial ability	successee's self-efficacy	succession plan
Weight	0.2195	0.4188	0.1503	0.2114
Total			1	
C.R.			0.1574	

4.3 The result of the second tier priorities

Each of the tier 1 has 3 sub factors as the second tier and the result of the second tier priorities was as follows.

In the relationship with a successee, the level of mutual trust was 0.4097, sharing vision of the company was 0.3114 and the level of communication was 0.2789. In a successee's managerial ability, business competence was 0.3526, education and training was 0.2944 and interpersonal management ability around succession was 0.3530. Third factor was a successee's self-efficacy and detailed factors in tier 2 had each result that willingness of succession was 0.3819, confidence of overcoming crisis was 0.3077 and confidence of achieving objectives. Lastly, in succession plan, finance plan was 0.6763, leadership transformation plan was 0.2173 and human-organization management plan was 0.1064. The C.R value for each tier

2 level was found to be less than 0.2, which is suitable for use in the study (Table 8).

<Table 8> Result of tier 2

Tier 1	Tier 2	Weight	C.R.
relationship with a successee	Level of mutual trust	0.4097	0.1171
	Sharing vision of the company	0.3114	
	Communication	0.2789	
successee's managerial ability	Business competence	0.3526	0.128
	Education and training	0.2944	
	Interpersonal management ability	0.3530	
successee's self-efficacy	Willingness of succession	0.3819	0.0964
	Confidence of overcoming crisis	0.3077	
	Confidence of achieving objectives	0.3104	
succession plan	Finance plan	0.6763	0.1576
	Leadership transformation plan	0.2173	
	Human-organization management plan	0.1064	

4.4 Result of the final priorities

In this study, for finding the final priority that influence the succession., final weights are calculated by multiplying the result of the first tier and the result of the second tier. As a result, the final weight and priority are shown in Table 9 below.

<Table 9> result of final weight and the priority

Tier 1	Tier 2	Final weight	Priority
relationship with a succeesee	Level of mutual trust	0.0899	5
	Sharing vision of the company	0.0683	6
	Communication	0.0612	7
succeesee's managerial ability	Business competence	0.1476	2
	Education and training	0.1233	4
	Interpersonal management ability	0.1478	1
succeesee's self-efficacy	Willingness of succession	0.0573	8
	Confidence of overcoming crisis	0.0462	9
	Confidence of achieving objectives	0.0466	10
succession plan	Finance plan	0.1429	3
	Leadership transformation plan	0.0459	11
	Human-organization management plan	0.0224	12

5. Conclusion

In this study, we analyzed the factors affecting succession that must be solved in family business from the viewpoint of successor. The successor is the most important person in succession, and the successor actually influences to an almost entity about succession.

Factors we used in this study were found to influence a succession in previous research. The first tier consisted of 4 factors, the relationship with a succeesee, a succeesee's managerial ability, a succeesee's self-efficacy and succession plan. The second tier is comprised of three factors in each tier 1.

The results of this study are as follows. First of all, successors seemed that interpersonal management ability was more important than others. This was supposed that

when successors meditate succession, they should consider not only family members, but also non-family members in the company. Because of this reason, successors were seemed that the most important for a succeesee is to set the relationship with the surrounding people related to succession positively. In addition, this could be predicted that a successor thinks difficult to make successful succession without the consent or support of those who already have a deep relationship with a successor in the public or private. Second, successors could see that succeesee's management capacity is important. In the case of successors, they should be considered not only the succession process but also the situation of the company after succession and their retirement. Therefore, successors, after succession and their retirement, judge that a succeesee's managerial ability was a necessary factor successfully lead the company. In particular, trust and relationship with a succeesee are important, but by choosing the succeesee's managerial capacity rather than those, this means that they are worried about the future of the company after succession. Third, the successor picked up financial planning as the third most important succession factor. This could be seen as a result of limitations that are not favorable finance policies to succession or family business. In addition, to a successor, it is easy to identify and access most of the property of the company and the family. Therefore, it can be easily predicted what kind of financial problem the successor will face when the succession proceeds without the financial plan. In order to solve such a predictable problem, this is understood that successors have chosen the financial plan as an important factor influencing succession. Fourth, the psychological state and willingness of the succeesee seemed to be less important than others. In particular, the willingness of succession was chosen as the eighth important factor, and confidence of overcoming crisis and confidence in achieving objectives were chosen as the 9th and 10th priorities. When a successor selects a succeesee, comparing with a succeesee's managerial ability which sub factors were selected the first, second and fourth, a successor judge a succeesee with managerial ability rather than psychological factors. This is interpreted that a succeesee, who is recognized as having a higher level of managerial ability than a succeesee with higher confidence, is more likely to be selected by the successor.

Successors could effectively be classified as the important person that makes decisions in all succession processes

such as selecting, training and inheriting a succeesee. However, successors could not prepare all the successions in which there are many complicated variables. Therefore, it is expected that they should be an effort to plan and prepare the succession sequentially according to the priority of the results shown in this study.

5.1 Discussion and future research

According to the results of this study, it is necessary to study the new complicated and diverse factors affecting the succession for companies that want to have sustainability. In this study, the factors influencing the succession in the previous study were selected and studied. However, it is necessary to study various factors influencing the succession.

This study, the factors influencing succession, was studied only from the viewpoint of the successor. For this purpose, only the family businesses as defined in this study were distributed, collected, and researched during the questionnaire distribution stage. However, the view of the successor was held faithfully, but did not reflect the views of the other members related to family business. In particular, because successors chose the interpersonal management ability as the most important factor, it seems necessary to study the factor in detailed and various views such as other family members and non-family members. In this context, studying the detailed definition of family members and non - family members, and strategies on how to approach each member for successful succession would be needed.

A detailed study about the managerial ability factor which selected as the second priority by successors would be necessary. A study that what fields and methods to fill the ability, and how level of succeesee's ability successors want would be needed. Especially, it seems necessary to study precisely the definition of succeesee's managerial ability desired by a successor. Third, previous research showed that the willingness of succeesee had an important influence on succession and succeesee's satisfaction. On the other hand, the willingness of a succeesee was selected as the eighth lowest level. Because of this, a study why they have a different view about same factor would be necessary. In addition, detailed research would be needed, such as whether it was a choice based on an environment such as only having one child, or whether the successor's managerial ability is really prioritized over the current psychological state.

Further study whether the successor's point of view changes according to the gender or age of a succeesee and whether there is a change in the outcome according to the characteristics of the products or the industry would be needed. Finally, it is necessary to make strategic guidelines on how the family business should succeed with various plans and processes in order to make successful succession by collectively judging various factors and aspects of the members influencing succession.

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Motivational Measures Adopted in Nepalese Higher Education Sectors Especially in Privately Run Organization

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Abstract

There is growing concern for motivation in these days because every organization feels needs to use its human resource in optimum level. There have always been issues to identify what factors motivate the employee. Is it financial or non-financial? What should be the proportion of financial and non-financial? What people prefer in higher education sectors of Nepal? These have been the major issues this article discusses and tries to answer. The sources of data are primary and secondary. The literatures are critically analyzed.

Keywords

Motivation, motivational measures

Introduction

No people work unless he/she wants to work. This was realized in mid-20th, so many scholars strive to develop theories and principles to motivate the people at work. For instance Maslow's hierarchy of needs (1943), Herzberg's two-factor theory (1959) and Vroom's expectancy theory (1964) came out as the emerging theories of that time. It is the Herzberg (1959), who defined employee motivation "as performing a work related action because you want to". A number of theories have come out now; the examples are goal setting theory, recognition, etc.

The need of this study related to motivational issues is felt for various reasons. The investments to these colleges are billions in Rupees. There are more than thirteen hundred privately run higher education colleges in the country running under different universities and around twenty six thousand people work there. More than 200 thousand students read there. So any study made to these areas is not worthless from country's perspectives. Motivation of this people working in this area has been essential so that thousands and thousands people will be beneficial directly and indirectly.

Statement of the problem

These days 'no performance' or 'under performance' has been the topic of the talk of town. What is the role of HR department in motivating employee, what motivates the employees, what are the reinforcers to reinforce the people working in the organizations, how such reinforcement should be provided, when such reinforces should be provided, which department of the organization should take responsibilities, etc. are the burning problems in the area of motivating the employees. Some literatures are available in the issues but they address situation of elsewhere rather than of Nepal. This is exemplified in literature review part of this article in brief. Whatever literature available mostly they address the issues of outside the country; therefore the researcher has felt the need of carrying such research. Basically in the country Nepal, in its higher education sectors, especially in privately run colleges, this type of researches addressing motivational issues have not been done earlier. So this study is forwarded.

Objectives

The objective of this research is to investigate what is the status of different motivating factors in motivating the

human resources involved in education sectors of higher education providing colleges.

Research questions

The researcher wants to know how different aspects of motivation is playing role in the colleges of higher education, what is the status of salary, employee participation, promotion, leave, motivational talks and recognition in the different colleges providing higher education.

Review of literature

Review of some of recent literature were done for this study.

Razi and Maulabakhsh (2015) have found working environment as important factors to maximize the level of employee job satisfaction.

Bista (2016) finds that pay, promotion, job safety and security, relationship with coworkers and supervisor are the top most influencing factors.

Hoque and Raihan (n.d.) revealed job autonomy, promotional opportunities, job security; salary fringe benefits have positive relation with the overall job satisfaction.

Ramesh, & Malika. (2010) revealed the positive relation among organization commitment, job involvement, and quality of work life, organization climate, income, and job satisfaction.

Yasir and Fawad (2009) found pay system, reward, promotion opportunities, and relation with coworkers and boss as motivating factors.

Hunjra, Chani, Aslam, Azam and Rehman (2010) found the effect of the HRM practices like team work environment, leadership behavior and job autonomy in job satisfaction.

Agbozo, Owusu, Hoedoafia and Atakorah (2017) investigated that good communication and relationship has positive relationship with the employee satisfaction.

Research gap

The literature review suggested as these researches were carried out in different banks and other sectors, not in the colleges running higher education, and they were mostly not of Nepal. But we need the knowledge of Nepal.

Conceptual framework

The conceptual framework made on this study is given in figure 1

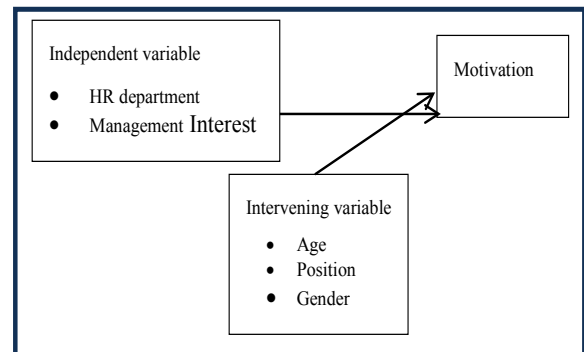


Figure 1: Conceptual framework

Hypothesis

Following hypothesis were generated in this study

H0= there is no role of HR department to motivation of employees

H0=there is no relation of management interest to employee motivation

H0=there is no role of age to motivation of employee

H0=there is no role of position to motivation of employee

H0=There is no role of gender to motivation of employee

Methodology

1. The study is piloting study for extensive research. The research design is quantitative, both primary and secondary data were used as sources of information.
2. Participants constitutes 4 participants from 7 colleges, all were random, which will not be used in the final research work.
3. Senior member of the college as far as possible, if not available then junior member were taken for collecting information it is because junior members have not socialized and understood the organization and little knowledge regarding what the organization is doing.
4. The instruments used were semi structured questionnaire.
5. The questionnaire constitutes 9 questions with sub questions related to what are the practices of motivating, and what they prefer.

6. Data were described and analyzed with the help of Respondent table, descriptive statistics, ANOVA, Structural Equation Modeling(SEM),
7. Research ethics were maintained by following due procedures of research.
8. Reliability is maintained with Cronbach's alpha.

Limitation

This is a pilot study run before going extensively in the research of privately run higher education sector of Nepal to reveal motivational issues. Generalization will be affected due to its small sample size, limited review of literature and few essential tools applied.

Results and discussion

The profile of the respondent's displays the sample size small. The profile shows all 27 officers out of 28 ie 96 %. Similarly, 82% (23 out of 28 are male) and age of above 40 are 50% (14 out of 28, including female employees)

Table 1: Age * Gender * Position Cross tabulation

Count					
Position			Gender		Total
Male					
Female					
Non-of-ficer	Age	35-40	1		1
	Total		1		1
officer	Age	15-20	1	0	1
		25-30	0	1	1
		30-35	5	1	6
		35-40	5	1	6
		40-above	11	2	13
	Total		22	5	27
Total	Age	15-20	1	0	1
		25-30	0	1	1
		30-35	5	1	6
		35-40	6	1	7
		40-above	11	2	13
	Total		23	5	28

Source: Field survey

To the question are you satisfied with the support from the HR department? The respondents answer is displayed in Table 2. Majority of the employees seem satisfied. 49.7 stated satisfied and 10.7 stated strongly satisfied.

Table 2: Satisfaction with HR Department

	Respondent	Percent
Strongly dissatisfied	1	3.6
Dissatisfied	2	7.1
Neutral	10	35.7
Satisfied	12	42.9
Strongly satisfied	3	10.7
Total	28	100.0

Source: Field survey

To the question is management really interested in motivating the employees? The answers are displayed in Table 3.

Majorities seem agreed by 32.1% and 35.7% stating agree and strongly agree respectively.

Table 3: Agreement towards management interest to motivating employees

	Respondent	Percent
Disagree	2	7.1
Neutral	7	25.0
Agree	9	32.1
strongly agree	10	35.7
Total	28	100.0

Source: Field Survey

To the enquiry which type of incentives motivates you more? The answer is displayed in Table 4

Their answers are both (financial and non-financial) by 78.6%, however the numbers of respondents who are motivated by financial incentives are nearly double than of the non-financial incentives.

Table 4: Types of incentive which has motivated employees

	Respondent	Percent
Financial	4	14.3
nonfinancial	2	7.1
both	22	78.6
Total	28	100.0

Source: Field survey

To the enquiry how far you are satisfied with the incentives provided by the organization? The answer is displayed in Table 5. The Table shows that 50% are satisfied by stating 35.7% satisfied and 14.3% strongly satisfied. Nearly half (46.4%) respondents stated neutral in this connection.

This means the situation is not there to be fully assured that most of the employees are satisfied.

Table 5: Level of satisfaction with the incentives

	Respondent	Percent
Dissatisfied	1	3.6
Neutral	13	46.4
Satisfied	10	35.7
Strongly satisfied	4	14.3
Total	28	100.0

Source: Field survey

Opinion of respondents in relation to different aspects of motivations

The Table 6 displays the ratings of existing human resource management functions to be motivating. The statement that received highest is Support from the co-worker is helpful to get motivated (4.57 mean out of 5), Performance appraisal activities are helpful to get motivated.

Performance appraisal activities are helpful to get motivated received mean vale 4.53 out of 5. And good relation with coworker received mean value 4.28.

Table 6: Descriptive statistics

	Min	Max	Mean	Std. Dev
Reasonable periodical increase in salary	2.00	5.00	3.7857	1.03126
Job security exist in the company	1.00	5.00	3.6429	1.19301
Good relationship with co-workers	3.00	5.00	4.2857	.59982
Effective performance appraisal system	2.00	5.00	3.6429	.86984
Effective promotional opportunities in the organization	2.00	5.00	3.6071	1.03062
Good safety measures adopted in the organization.	1.00	4.00	3.1071	.83174
Performance appraisal activities are helpful to get motivated	3.00	5.00	4.5357	.69293
Support from the co-worker is helpful to get motivated	3.00	5.00	4.5714	.57275
Company recognize and acknowledge your work	1.00	5.00	3.6786	1.12393

Source: Field Study

Employee ranking towards motivational measure is displayed in Table 7. This type of analysis was done by Herzberg in 1958. That time motivational factors like Recognition got first priority in ranking. But this is opposite, these days hygiene factors become important to the employees. The Table displays the preferences as follows: salary, promotion, motivational talks, and recognition and leave facilities. This means employees do not want leave but salary.

Table 7: Employee ranking towards motivational measures (the ranking based on 1 for first and so on)

	Mean ranking
Salary increase	1.7143
Promotion	2.3214
Leave	4.0714
Motivational talks	3.5000
Recognition	3.3929
Valid N (list wise)	

Source: Field study

Effects of gender, age and position on respondent's opinion

The Tables (annex 1, 2 and 3) given in annexes resemble whether employees opinions are affected by the intervening variables like age, gender and positions or not.

There is found Good relation with coworkers and promotion affected by gender (Annex 1). This is analyzed in Table 8.

There were not found significant differences in the opinion of respondents due to the age of the employees. Employees' positions also have no effect on respondents' opinion.

In order to know the mean differences between male and female respondents on the two issues significantly affected shown by ANOVA the male and female group statistics analysis was done through t test. The Table 8 displays the means on the two variables.

Table 8: Group Statistics to compare mean of male and female

	Gender	Mean
Good relationship with co-workers	Male	4.4348
	Female	3.6000
promotion	Male	2.5217
	Female	1.4000

Source: Field survey

Test of hypothesis

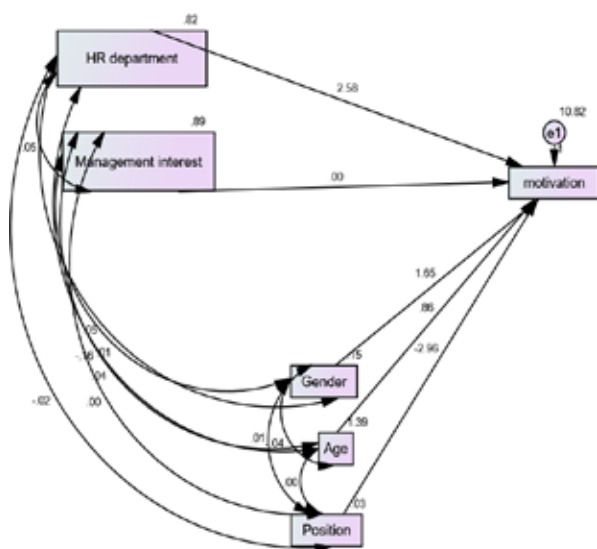
In order to test the hypothesis structural equation modeling was drawn and path analysis is shown.

Structural equation modeling states that only HR department's support satisfies employee.

The estimates structural equation modeling (Table 9) shows one variable named support of HR Department has relation with motivation. So hypothesis is rejected. For others cases like age, position, management interest and Gender have no effect to employee motivation.

Table 9: Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
motivation	<---	Gender	1.649	1.687	.977	.328	
motivation	<---	Age	.860	.545	1.578	.115	
motivation	<---	Postion	-2.961	3.451	-.858	.391	
motivation	<---	HR Department	2.583	.721	3.584	***	



Conclusion

The research concludes that HR Department has major roles to motivate the employees. The employees are expecting the supports from this department. The employee's first ranking of motivational factor is salary increase and promotion. Female employees ranking towards satisfaction shows that there is discrimination in relation with coworkers and promotion. However, this study is a pilot study by nature so further study is essential for generalization in Nepalese context.

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Appendixes

Annex 1: Effects of gender on opinions of respondents

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Are you satisfied with the support from the HR department?	Between Groups	.548	1	.548	.634	.433
	Within Groups	22.452	26	.864		
	Total	23.000	27			
Management is really interested in motivating the employees?	Between Groups	.008	1	.008	.008	.929
	Within Groups	24.957	26	.960		
	Total	24.964	27			
Which type of incentives motivates you more?	Between Groups	.011	1	.011	.020	.888
	Within Groups	14.417	26	.555		
	Total	14.429	27			
How far you are satisfied with the incentives provided by the organization?	Between Groups	2.139	1	2.139	3.826	.061
	Within Groups	14.539	26	.559		
	Total	16.679	27			
Reasonable periodical increase in salary	Between Groups	1.045	1	1.045	.982	.331
	Within Groups	27.670	26	1.064		
	Total	28.714	27			
Job security exist in the company	Between Groups	.776	1	.776	.536	.471
	Within Groups	37.652	26	1.448		
	Total	38.429	27			
Good relationship with co-workers	Between Groups	2.862	1	2.862	10.860	.003
	Within Groups	6.852	26	.264		
	Total	9.714	27			
Effective performance appraisal system	Between Groups	.776	1	.776	1.027	.320
	Within Groups	19.652	26	.756		
	Total	20.429	27			
Effective promotional opportunities in the organization	Between Groups	.939	1	.939	.881	.357
	Within Groups	27.739	26	1.067		
	Total	28.679	27			
Good safety measures adopted in the organization.	Between Groups	1.479	1	1.479	2.235	.147
	Within Groups	17.200	26	.662		
	Total	18.679	27			
Performance appraisal activities are helpful to get motivated	Between Groups	1.312	1	1.312	2.928	.099
	Within Groups	11.652	26	.448		
	Total	12.964	27			

Support from the co-worker is helpful to get motivated	Between Groups	.005	1	.005	.015	.905
	Within Groups	8.852	26	.340		
	Total	8.857	27			
Company recognize and acknowledge your work	Between Groups	3.168	1	3.168	2.662	.115
	Within Groups	30.939	26	1.190		
	Total	34.107	27			
salary increase	Between Groups	.045	1	.045	.039	.845
	Within Groups	29.670	26	1.141		
	Total	29.714	27			
promotion	Between Groups	5.168	1	5.168	4.343	.047
	Within Groups	30.939	26	1.190		
	Total	36.107	27			
leave	Between Groups	.101	1	.101	.073	.789
	Within Groups	35.757	26	1.375		
	Total	35.857	27			
motivational talks	Between Groups	.548	1	.548	.336	.567
	Within Groups	42.452	26	1.633		
	Total	43.000	27			
recognition	Between Groups	1.009	1	1.009	.828	.371
	Within Groups	31.670	26	1.218		
	Total	32.679	27			
Do you think that the incentives and other benefits will influence your performance?	Between Groups	.052	1	.052	.520	.477
	Within Groups	2.626	26	.101		
	Total	2.679	27			

Annex 2: Effects of age on opinions of respondents

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Are you satisfied with the support from the HR department?	Between Groups	2.841	4	.710	.810	.531
	Within Groups	20.159	23	.876		
	Total	23.000	27			
Management is really interested in motivating the employees?	Between Groups	6.994	4	1.748	2.238	.096
	Within Groups	17.971	23	.781		
	Total	24.964	27			
Which type of incentives motivates you more?	Between Groups	1.007	4	.252	.432	.784
	Within Groups	13.421	23	.584		
	Total	14.429	27			
How far you are satisfied with the incentives provided by the organization?	Between Groups	2.994	4	.748	1.258	.315
	Within Groups	13.685	23	.595		
	Total	16.679	27			
Reasonable periodical increase in salary	Between Groups	2.474	4	.619	.542	.706
	Within Groups	26.240	23	1.141		
	Total	28.714	27			
Job security exist in the company	Between Groups	8.518	4	2.130	1.638	.199
	Within Groups	29.910	23	1.300		
	Total	38.429	27			
Good relationship with co-workers	Between Groups	2.359	4	.590	1.844	.155
	Within Groups	7.355	23	.320		
	Total	9.714	27			
Effective performance appraisal system	Between Groups	3.637	4	.909	1.246	.320
	Within Groups	16.791	23	.730		
	Total	20.429	27			
Effective promotional opportunities in the organization	Between Groups	3.147	4	.787	.709	.594
	Within Groups	25.531	23	1.110		
	Total	28.679	27			
Good safety measures adopted in the organization.	Between Groups	2.724	4	.681	.982	.437
	Within Groups	15.954	23	.694		
	Total	18.679	27			
Performance appraisal activities are helpful to get motivated	Between Groups	.840	4	.210	.398	.808
	Within Groups	12.125	23	.527		
	Total	12.964	27			
Support from the co-worker is helpful to get motivated	Between Groups	1.590	4	.397	1.258	.315
	Within Groups	7.267	23	.316		
	Total	8.857	27			
Company recognize and acknowledge your work	Between Groups	2.019	4	.505	.362	.833
	Within Groups	32.088	23	1.395		
	Total	34.107	27			

salary increase	Between Groups	4.947	4	1.237	1.148	.359
	Within Groups	24.767	23	1.077		
	Total	29.714	27			
promotion	Between Groups	4.768	4	1.192	.875	.494
	Within Groups	31.339	23	1.363		
	Total	36.107	27			
leave	Between Groups	3.974	4	.994	.717	.589
	Within Groups	31.883	23	1.386		
	Total	35.857	27			
motivational talks	Between Groups	10.260	4	2.565	1.802	.163
	Within Groups	32.740	23	1.423		
	Total	43.000	27			
recognition	Between Groups	5.734	4	1.433	1.224	.328
	Within Groups	26.945	23	1.172		
	Total	32.679	27			
Do you think that the incentives and other benefits will influence your performance?	Between Groups	.898	4	.225	2.902	.044
	Within Groups	1.780	23	.077		
	Total	2.679	27			

Annex 3: Effects of Position on opinions of respondents

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
. Are you satisfied with the support from the HR department?	Between Groups	.259	1	.259	.296	.591
	Within Groups	22.741	26	.875		
	Total	23.000	27			
Management is really interested in motivating the employees?	Between Groups	.001	1	.001	.001	.971
	Within Groups	24.963	26	.960		
	Total	24.964	27			
Which type of incentives motivates you more?	Between Groups	.132	1	.132	.241	.628
	Within Groups	14.296	26	.550		
	Total	14.429	27			
How far you are satisfied with the incentives provided by the organization?	Between Groups	.382	1	.382	.610	.442
	Within Groups	16.296	26	.627		
	Total	16.679	27			
Reasonable periodical increase in salary	Between Groups	1.529	1	1.529	1.462	.237
	Within Groups	27.185	26	1.046		
	Total	28.714	27			
Job security exist in the company	Between Groups	1.910	1	1.910	1.360	.254
	Within Groups	36.519	26	1.405		
	Total	38.429	27			

Good relationship with co-workers	Between Groups	.085	1	.085	.229	.637
	Within Groups	9.630	26	.370		
	Total	9.714	27			
Effective performance appraisal system	Between Groups	.429	1	.429	.557	.462
	Within Groups	20.000	26	.769		
	Total	20.429	27			
Effective promotional opportunities in the organization	Between Groups	2.012	1	2.012	1.962	.173
	Within Groups	26.667	26	1.026		
	Total	28.679	27			
Good safety measures adopted in the organization.	Between Groups	.827	1	.827	1.204	.283
	Within Groups	17.852	26	.687		
	Total	18.679	27			
Performance appraisal activities are helpful to get motivated	Between Groups	.298	1	.298	.611	.442
	Within Groups	12.667	26	.487		
	Total	12.964	27			
Support from the co-worker is helpful to get motivated	Between Groups	.190	1	.190	.571	.456
	Within Groups	8.667	26	.333		
	Total	8.857	27			
Company recognize and acknowledge your work	Between Groups	2.922	1	2.922	2.436	.131
	Within Groups	31.185	26	1.199		
	Total	34.107	27			
salary increase	Between Groups	5.418	1	5.418	5.798	.023
	Within Groups	24.296	26	.934		
	Total	29.714	27			
promotion	Between Groups	.107	1	.107	.077	.783
	Within Groups	36.000	26	1.385		
	Total	36.107	27			
leave	Between Groups	.894	1	.894	.665	.422
	Within Groups	34.963	26	1.345		
	Total	35.857	27			
motivational talks	Between Groups	6.481	1	6.481	4.615	.041
	Within Groups	36.519	26	1.405		
	Total	43.000	27			
recognition	Between Groups	.160	1	.160	.128	.723
	Within Groups	32.519	26	1.251		
	Total	32.679	27			
Do you think that the incentives and other benefits will influence your performance?	Between Groups	.012	1	.012	.116	.736
	Within Groups	2.667	26	.103		
	Total	2.679	27			

The Impact of the Employee's Performance on the Organizational Growth – an Empirical Study on Management Stance

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Abstract

It is well familiar that the organizations develop and take care of their employee so that they can nurture faster; organizations created their industry strategy according to the growth of the current markets scenario. Better result is not dependent on the managerial responsibility it also depend on management supervision capabilities to recruit and retain the employees. The intention to conduct this study is to confer the concept of worker's routine and the managerial perception on it. This is obligatory to apply when referring to the organization important resource —means employee.

Similarly, an employee with higher competency level always has been targeted by the organization because he is the only source to perform extraordinary and he is only the creator of the positive image of the organization. So the organization uses his potential up to the maximum extent. As a result, the expectations will increase from both the side's employer and the employee side.

Our aim is to focus on that factor that affects employee's performance. And how their potential and performance will contribute to organization growth and better future prospective also how organization can encourage employee to retain them.

This empirical learning was conducted among 13 managers from different organization in Noida (India), with three hypotheses tested and complete.

Keywords

Emerging Growth, Employee performance, Management Perspective.

1. Introduction

Employee performance is the key for the growth of any organization. This is an important factor that needs to be focused by the management and it should be taken in to consideration for the internal growth of the organizations. Getting performance to the high level and maintaining this level for a long tenure with higher motivation is a big challenge. It requires higher aspirations and competent workforce along with capable management to retain and nurture.

The highly competent and motivated employees will increase the chances for the organization to take competitive advantages. A strong organization will be able to attract and retain talents. This study was conducted between 13 Managers from the dissimilar association in Noida.

In the new era of human resource management the performance management plays an important role as this is the way of utilizing the resource in a

Effective way. Basically it's a participative approach

where both employer and employee need to contribute .It's an ongoing cycle. So the organization needs to stream line the plan and strategy to develop the assets. Shields, 2001

According to Armstrong, 2006 to develop a competent workforce is the responsibility of the top managerial personnel .And it's their accountability to develop the competent culture."Grumman and Saks, 2011 believe that the Organization effectiveness and efficiency depend on performance of the employees. To train the employee performance management is the effective tool which provides a systematic process to alien the organizations goal and employee expectations like – workload planning and recompensation policy. According to the Rasch 2012 now a day's organization focusing on the technological resources can easy replace the human resources. In order to save the capital. And this capital will be invested into the market.

Pitt and Foreman, 1999 discussed performance as a relationship between consumer and the organization .If the performance increases the negotiation cost will also increase. This will be a major source of organization nonperformance, the superior presentation ambiguity within the employer- employee exchange will increase the conciliation cost. So the requirement should be clearly communicated by the management to the employee to reduce the chances of uncertainty.

Mishra 2010 discussed human resource as the most valuable assets for any organizations so it's the accountability of the organization to nurtured them.

The management goal is to keep them happy and provide them high chance to explore their strength. Lings, 2004 explains the performance management goal is not only to provide motivation, satisfaction, and organizational commitment but also helps to enhance the financial growth of the organizations.

2. Objective of the research

1. To categorize the policy of workers routine formulated by the superior and how do they assess it;
2. To discover the factor that influences how to retain good performing workers and formulate polices with pragmatic policies.
3. Recognize to what degree the workers aspiration are met, as well as superior's prospect;

4. To classify the employees' performance throw light into the growth of the organization;

The study followed three hypotheses:

H1: The various factors affect the employee performance and superiors consent. And these factors hold the employees to perform the task.

H2: Management role is to make strategies define the role of employees and make sure that their performance play significant role in the organizations growth.

H3: Worker's execution radically adds the boost in organization performance.

The trial size was 13 managers and supervisors of different private Organizations from different domains. This is an empirical study ambitious using through interview and discussion the total period was 2 weeks. The sitting was between 30 and 40 minutes with each respondent.

3. Result and discussion

At the beginning of the session the first supervisor discussed about the parameters of the performance. How the process will be followed throughout the year. What are the objective and the collective objective how the employee will meet these objective .And discussed the plan of action to convert efforts into results .Then the requisite competencies were also increased. Identification of performance factors also took place.

Some of the respondents suggest to organize the evaluation session twice or thrice in a year. Also discussed some key performance indictors to judge the performance. Like profit, organizational growth costs. Out of 13 the two superior were actively participating during the session. The remaining 11 respondent evaluated according to the level of given task and the complication level of the task and other parameters are workers competency, attitude towards the work, motivation and relationship with the others and the most important relationship with the customers .apart from this the decision making capabilities and the innovation qualities were also evaluated by them. it was found personal motivation is the most prominent factor of affecting employees performance moreover other factors which exhibit their influence are positive like working cultural , promotion opportunity , reward ,incentive as well as the relationship by the customer also a factor .

The evaluation of the remaining 11 respondents was done on the basis of set parameters .the underline cause of the aforesaid problem was long term services in the same company and lack of effective communication between the employer and employees.

The other mangers agreed that they were having long working hours with full of responsibility and accountability .They are having high level of dissatisfaction when they were linking their job with responsibility. This is the main cause for increasing their performance level. Motivation level decrease because of the salary expectations and so does the performance level. Thus can be concluded, that the H1 can be accepted, of course, organization performance is directly linked to the employee performance and the management and supervisor are trying to find out new strategy to enhance the performance of the organization and they are trying to create positive image of the organization in competitive business environment.

Recruiting a competent workforce, nurturing and retaining them is a big challenge for the organization. For retaining them organization normally offers salary increments, promotions and for the development professional training likes Six Sigma, TQM, Sensitivity training etc. so they can value to their candidature. They become more skilled .Which would enhance their earning capacity .Management also provide the opportunity to participate the employee various carrier development programmes. On the basis of the second session conducted to prove the H2 it was found that .they prioritize employee's ability over the organizations interest

In the modern business scenario everyone is looking for competent work force. Organization can't sustain with limited resource. Technological era is replacing the human capital. So organization is trying hard to sustain by retaining the competent workforce by providing them better facilities, higher carrier opportunity to succeed and high economical status. Policy can also be formulated on consideration of an employee .After the observation we can assume H3 is accepted.

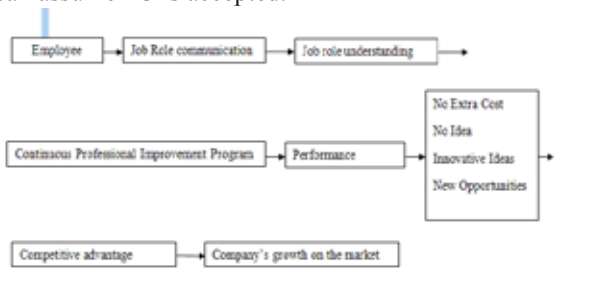


Fig.1 Stages of the worker's execution affect on rganizational growth

Role clarity, transparent communication, work ownership and continuous employee development programs are the advantage for the organization to grab the new market opportunity.

Conclusions

As per the discussion, the respondents are mainly focusing on the personal aspects it is important for the organization growth .Adding into that customer relationship is also matter for the organization growth as well as the employee concern . More loyal customer will contribute in to the organization development .There are several factors which are influencing the employee performance in the organizations. The Management is ambiguous and unclear about the employee perspective or needs .The management should comprehend that rather develop uniform pattern of the responsibilities they should allocate responsibilities to the employees ,keeping the view of employee competency .As this should reduce unnecessary conflict and chaos.

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Does Empowering Leadership Affect Organizational Innovation A PLS-SEM Approach

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Abstract

Innovation is an inexorably vital management capacity to guarantee a company's development. In any case, firms require creative employees to start authoritative innovation. Of course, employee creativity is perceived as key for producing an upper hand. The main objective of the current study is to examine the impact of empowering leadership on organizational innovation. The questionnaire was utilized in this study to collect data from the population of Dubai police department by using probability random sampling. Structural Equation Modeling-Variance Based (SEM-VB) was utilized to examine the research model in this research, by using the SmartPLS 3.0 software. The result from the analysis shed lights on the impact of empowering leadership on organizational innovation. The proposed research model explained 37% of the organizational innovation (OI). Empowering leadership had a positive direct effect on the OI within the public sector in the United Arab Emirates (UAE). The results of the current study have the potential to give further insights into the innovation of organizations strategies.

Keywords

Empowering leadership; organizational innovation; UAE

1. Introduction

Innovation is an inexorably vital management capacity to guarantee a company's development (Han, Kim, & Srivastava, 1998; Zopiatlis & Theocharous, 2018). In any case, firms require creative employees to start authoritative innovation. Of course, employee creativity is perceived as key for producing an upper hand (e.g., Kim & Koo, 2017; Shalley, Zhou, & Oldham, 2004). The field of organizational behavior has seen an expanding enthusiasm for understanding elements that advance employee creativity; the development of new and valuable thoughts concerning items, administrations, procedures, and systems in associations (Amabile, 1983; Amabile, Conti, Coon, Lazenby, & Herron, 1996; Oldham & Cummings, 1996).

In spite of the fact that various studies have researched the effect of pioneers on creativity, these studies have to a great extent concentrated on issues of leader support (e.g., Amabile, Schatzel, Moneta, & Kramer, 2004) and leader-member exchange (e.g., Tierney, Farmer, & Graen, 2006). Moreover, specialists have started exploring more extensive hypotheses of lead leadership behavior, for example, transformational leadership

hypothesis, with blended outcomes (see Tierney, 2008). Observably absent from inquiring about consideration has been empowering leadership, regardless of proposals by creativity analysts that researchers concentrate more noteworthy exertion on leadership approaches that can address the essential underpinnings of creativity [10], [11]. Since empowering leadership includes imparting capacity to a view toward upgrading employees' motivation and interest in their work (Kirkman & Rosen, 1999; Kirkman & Rosen, 1997; Thomas & Velthouse, 1990), there are real reasons (point by point underneath) to anticipate that empowering leadership will positively affect creativity (Amabile, 1983; Amabile et al., 1996; Amabile et al., 2004; Thomas & Velthouse, 1990). Subsequently, a major purpose of this study was to build and test the theory that addresses the connection between empowering leadership and creativity, including several important intervening variables.

The main objective of this study is to examine the impact of empowering leadership on the organizational performance within the police sector in the United Arab Emirates (UAE).

2. Literature Review

2.1 Organizational Innovation (OI)

There exists a various range of innovation definitions. First, a considerable number of researches have debated that creative thing means innovation. For instance, Rogers (1995) indicates that innovation is creating a new object, practice, or idea according to the assessment of an individual or another unit of adoption. Moreover, another concept was discussed by Rogers (1995), known as innovation diffusion which, focuses on the spread, over time, through different channels of innovation among the members of a social system. On the other hand, according to Amabile (1983), innovation is different from creativity which is the only thing that could be defined as the production of new ideas. Furthermore, Trott (2005) suggests that Innovation generates and implements new processes, products, and ideas. Consequently, creativity is a component of innovation [17]. Even though services and goods have unique different characteristics ds, numerous studies such as de Vries (2006), and Droege, Hildebrand, & Forcada (2009) revealed that, in the service context and according to the adaptation approach, the theories and notions of innovation used in the manufacturing sector were easily transportable to the service sector. With the purpose of investigating innovation in the service sectors, Droege et al. (2009) stated that these studies used the same models as in the manufacturing sector, without affecting the characteristics of innovation in service. Thus, there is a need to inspect the constructs of the study that affects the innovation of the organization.

2.2 Empowering Leadership (EL)

Empowering leadership has been characterized as the procedure by which pioneers share control with employees by giving extra obligation and basic leadership specialist overwork and assets and the help expected to deal with the extra duty successfully [20], [21]. Empowering leadership is identified with the idea of appointment yet varies in that assignment by and

large alludes to employee responsibility for undertakings, though empowering leadership infers a progressing theory of sharing more extensive obligations [22]. Considerable research highlighted the critical and significant role of empowering leaders in motivating their subordinates to show high performance (e.g., Druskat & Wheeler, 2003; Durham, Knight, & Locke, 1997; Judge, Piccolo, & Ilies, 2004) and creative and innovative behavior [26]–[28]. Numerous studies had investigated the impact of leadership behavior on employee creativity or employee innovative behavior (e.g., Herrmann & Felfe, 2014; Javed, Rawwas, Khandai, Shahid, & Tayyeb, 2018; Shin & Zhou, 2003; Yoshida, Sendjaya, Hirst, & Cooper, 2014; S. Zhang, Ke, Frank Wang, & Liu, 2018), however, empowering leadership has special influence on employee creativity, as is consistent with the trend toward providing high autonomy and empowerment to employees [27], [33]. Given the predominant job of empowering leadership in the work environment (Kim & Beehr, 2017; Li, Chiaburu, & Kirkman, 2014; Zhang & Bartol, 2010), one key situational factor that may have significant effect on creativity is leadership (Zhang & Bartol, 2010; Zhang & Zhou, 2014). Consequently, the following hypotheses are proposed:

H1: Empowering Leadership has a positive effect on Organizational Innovation.

3. Research Method

3.1 Overview of the Proposed Conceptual Framework

Based on the resource-based view and resource dependence theory, this study built the main relationship between empowering leadership and organizational innovation. In respect of empowering leadership, Kim & Beehr (2017), Zhang & Bartol (2010), and Zhang & Zhou (2014b) found that this kind of leadership style influences positively the innovation. Figure 1 depicts the conceptual model that was built on the review on the literature review.

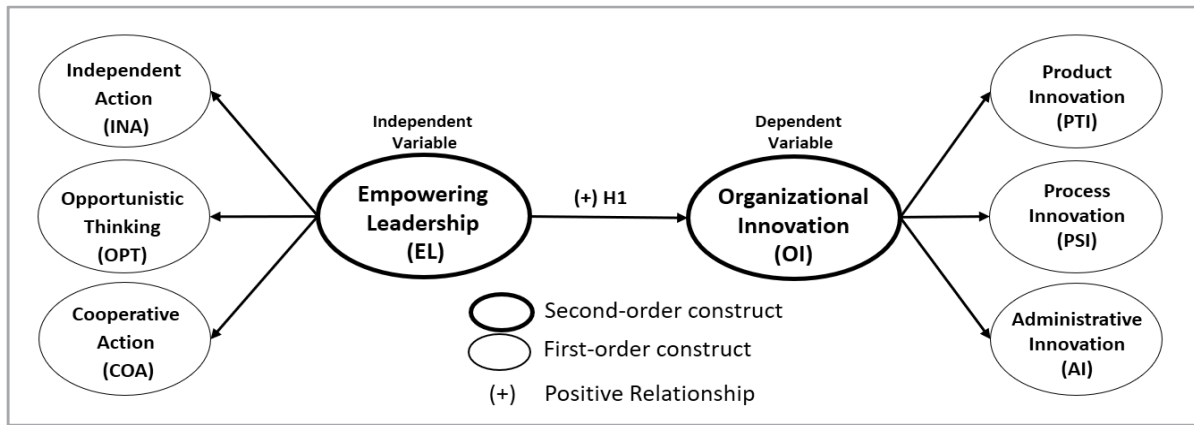


Figure 1: The proposed conceptual framework

3.2. Development of Instrument and Data collection

A questionnaire specially designed to measure all the main constructs of the research model was used to collect data for this study, it contained close-ended questions that were tested and translated into the Arabic language since the respondents would be from the UAE. The study selected the sample from the population of Dubai police department by using probability random sampling. This is when every element in the population have an equal chance of being selected as a subject [38]. Probability random sampling, in particular, gives the researchers the chance to choose equally from the sample frame.

4. Data Analysis and Results

PLS (Partial Least Squares) SEM-VB (Structural Equation Modelling-Variance Based) was employed to assess the research model by utilizing the software SmartPLS 3.0 [39]. A two-phase analytical technique (Anderson & Gerbing, 1988; Hair, Hult, Ringle, & Sarstedt, 2017) consisting of (i) measurement model analysis (reliability and validity) and (ii) structural model analysis (examining the conceptualized relationships) was employed after performing the descriptive assessment.

4.1 Descriptive analysis

Table 1 presents the mean and standard deviation of each variable in the current study. The respondents were asked to indicate their opinion in relation to empowering leadership and organizational innovation based on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Product

innovations scores the highest with a mean 3.459 out of 5.0, with a standard deviation of 1.207.

4.2 Measurement Model Assessment

Construct reliability as well as validity (comprising discriminant and convergent validity) were used to examine the measurement model. The particular alpha coefficients of Cronbach were tested to determine the reliability of every core parameter in the measurement model (construct reliability). The quantities of all the unique alpha coefficients of Cronbach in this research ranged from 0.893 to 0.975, which went beyond the proposed value of 0.7 (Kannana & Tan, 2005; Nunnally & Bernstein, 1994). Moreover, for inspecting construct reliability, all the CR (composite reliability) values ranged from 0.933 to 0.983, which went beyond 0.7 (Werts, Linn, & Jöreskog, 1974; Kline, 2010; Gefen, Straub, & Boudreau, 2000). Thus, as Table 1 shows, construct reliability has been fulfilled as Cronbach's CR and alpha was rather error-free for all the parameters.

Analysis of indicator reliability was conducted by utilizing factor loadings. When the related indicators are very similar, this is reflected in the construct and signified by the construct's high loadings [41]. As per Hair et al. (2010), the exceeding of values beyond 0.70 suggests substantial factor loadings. Table 1 displays that all items in this research had factor loadings greater than the suggested value except for item AI4 which eliminated from the scale due to low loadings.

AVE (average variance extracted) was employed in this study to analyze *convergent validity*, which represents the degree to which a measure is correlated positively with the same construct's other measures. All the AVE values ranged from 0.822 and 0.952, which went beyond the proposed value of 0.50 [46]. Thus, all constructs have complied with the convergent validity acceptably, as shown in Table 1.

Table 1: Measurement model assessment

Constructs	Item	Loading (> 0.7)	M	SD	α (> 0.7)	CR (> 0.7)	AVE (> 0.5)
Independent Action (INA)	INA1	0.950	3.217	1.173	0.942	0.963	0.896
	INA2	0.944					
	INA3	0.946					
Opportunistic Thinking (OPT)	OPT1	0.866	3.287	1.076	0.893	0.933	0.824
	OPT2	0.929					
	OPT3	0.926					
Cooperative Action (COA)	COA1	0.921	3.185	1.109	0.915	0.946	0.854
	COA2	0.932					
	COA3	0.919					
Product Innovation (PTI)	PTI1	0.981	3.459	1.207	0.975	0.983	0.952
	PTI2	0.980					
	PTI3	0.966					
Process Innovation (PSI)	PSI1	0.955	3.425	1.165	0.946	0.965	0.903
	PSI2	0.945					
	PSI3	0.951					
Administrative Innovation (AI)	AI1	0.943	3.418	0.929	0.927	0.949	0.822
	AI2	0.924					
	AI3	0.937					
	AI4	Deleted					
	AI5	0.816					

Note: M=Mean; SD=Standard Deviation, α =Cronbach's alpha; CR = Composite Reliability, AVE = Average Variance Extracted.
Key: INA: Independent Action, OPT: Opportunistic Thinking, COA: Cooperative Action, PTI: Product Innovation, PSI: Process Innovation, AI: Administrative Innovation.

The degree to which the articles distinguish among concepts or measure different constructs is demonstrated by discriminant validity. Fornell-Larcker was employed to analyze the measurement model's discriminant validity. Table 2 shows the outcomes for discriminant validity by employing the Fornell-Larcker condition. It was discovered that the AVEs' square root on the diagonals (displayed in bold) is bigger than the correlations among constructs (corresponding row as well as

column values), suggesting a strong association between the concepts and their respective markers in comparison to the other concepts in the model (Fornell & Larcker, 1981; Chin, 1998). According to Hair et al. (2017), this indicates good discriminant validity. Furthermore, exogenous constructs have a correlation of less than 0.85 [49]. Therefore, all constructs had their discriminant validity fulfilled satisfactorily.

Table 2: Fornell-Larcker criterion

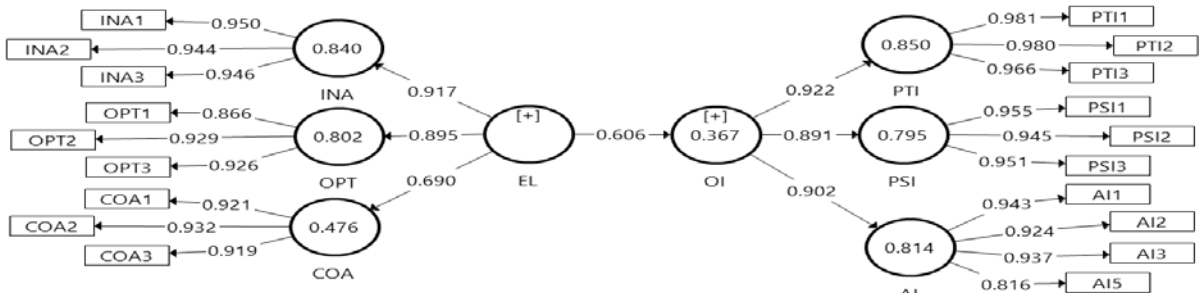
	AI	COA	INA	OPT	PSI	PTI
AI	0.907					
COA	0.511	0.924				
INA	0.387	0.434	0.947			
OPT	0.461	0.396	0.812	0.908		
PSI	0.681	0.530	0.513	0.352	0.950	
PTI	0.741	0.523	0.444	0.486	0.769	0.976

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

Key: INA: Independent Action, OPT: Opportunistic Thinking, COA: Cooperative Action, PTI: Product Innovation, PSI: Process Innovation, AI: Administrative Innovation

4.3 Structural Model Assessment

The structural model can be tested by computing beta (β), R^2 , and the corresponding t -values via a bootstrapping procedure with a resample of 5,000 (Hair, Hult, Ringle, & Sarstedt, 2017)



Key: EL: Empowering Leadership, INA: Independent Action, OPT: Opportunistic Thinking, COA: Cooperative Action, OI: Organizational Innovation, PTI: Product Innovation, PSI: Process Innovation, AI: Administrative Innovation

Figure 2: PLS algorithm results

Figure 2 and Table 3 depict the structural model assessment, showing the results of the hypothesis tests. Empowering leadership positively influence organizational innovation. Hence, H1 is accepted with ($\beta = 0.606$, $t = 13.799$, $p < 0.001$). Empowering leadership explains Thirty-seven

percent of the variance in organizational innovation. The values of R^2 have an acceptable level of explanatory power, indicating a substantial model (Cohen, 1988; Chin, 1998).

Table 3: *Structural path analysis result*

Hypothesis	Relationship	Std Beta	Std Error	t-value	p-value	Decision	R ²
H1	EL→OI	0.606	0.044	13.799	0.000	Supported	0.37

Key: EL: Empowering Leadership, OI: Organizational Innovation

5. Discussion

The main objective of the current study is to examine the impact of empowering leadership on the organizational innovation within the police sector in the UAE. As such, one hypothesis was generated to fulfill the main objective. Empirical results of testing the hypothesis show that there is a positive significant influence of the empowering leadership on the organizational innovation with ($\beta = 0.606$, $t = 13.799$, $p < 0.001$). Thus, the result shows that H1 is supported. This is explained by the fact that the leaders in the organization encourage employees to find solutions to their problems without his/her direct input, leaders in the organization advise employees to look for the opportunities in the problems they face, leaders in the organization urge employees to work as a team with the other employees who work at the organization. The newer technology is adapted in the organization for improving the work processes (Computers, wireless networking, etc.), we try new

methods for improving processes (Paperless environment, online learning, etc.), and our organization is quick to respond to the changing needs of its customer.

6. Conclusion

The purpose of this article was to examine the impact of empowering leadership on the organizational innovation in the Dubai police department in the UAE. It has provided evidence from leading scholars in the field on the notion of empowering leadership and how to improve this leadership style to improve the required for the development of the building blocks of any organization (individuals) and consequently in organizations performance (innovation). This article has shed some light on the organization innovation in the public sector in the UAE and the importance of empowering leadership in that regard and proved that empowering leadership plays a role helping the organizations to improve their innovation and compete to stay alive.

Appendix

Appendix A

Instrument for variables

Variable	Measure	Source
Independent Action (INA)	INA1: leaders in the organization encourage me to find solutions to my problems without his/her direct input. INA2: leaders in the organization urge me to assume responsibilities on my own. INA3: leaders in the organization advise me to solve problems when they pop up without always getting a stamp of approval.	
Opportunistic Thinking (OPT)	OPT1: leaders in the organization urge me to think of problems as opportunities rather than obstacles. OPT2: leaders in the organization advise me to look for the opportunities in the problems I face. OPT3: leaders in the organization encourage me to view unsuccessful performance as a chance to learn.	[52][53]
Cooperative Action (COA)	COA1: leaders in the organization urge me to work as a team with the other employees who work at the organization. COA2: leaders in the organization encourage me to work together with other employees who work at the organization. COA3: leaders in the organization advise me to coordinate my efforts with the other employees who work at the organization.	
Product Innovation (PTI)	PTI1: Our organization always develop new product and services. PTI2: Our organization try to introduce and diversify our product to suit customer needs	[54]

Process Innovation (PSI)	PTI3: Our organization always try applying a new idea/technology at our organization. PSI1: In our organization, new technology is adapted for improving the work processes (Computers, wireless networking, etc.). PSI2: In our organization, we try new methods for improving processes (Paperless environment, online learning, etc.). PSI3: Our organization is quick to respond to the changing needs of its customer.
Administrative Innovation (AI)	AI1: In our organization, administrative support is always there for employees. AI2: In our organization, the employees' compensation system is linked to performance. AI3: Our organization has a new and improved performance evaluation system. AI4: In our organization, we believe in the open communication environment. AI5: In our organization, employees are hired on their creativity.

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Technology, Connectivity and Psychological Contract: Case of South Korean and New Zealand Organizations

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Abstract

This empirical paper discusses the complex relationship between connectivity and psychological contract in different cultural contexts. In particular, we focus on the increased level of connectivity in terms of psychological contract from a cross-cultural perspective, by examining in-depth interview data from six companies across two different cultures. This current paper suggests that workers in both New Zealand and South Korean organizations experience stress due to the heightened connectivity, and expectations to work regardless of formal work time and space. However, due to the contrasting cultural norms that influence workplace relationship structure the way such stress is portrayed is different across the two cultural contexts,. This creates important implications for managing employees, their technological devices, and systems, in specific cultural contexts or multinational organizations.

Keywords

Connectivity, International studies, Psychological contract, Technological change, Work-Life Balance

1. Introduction

The rapid change and application of information technology in the business world provides many questions about the transformation of business and management practices. One of these questions relates to the increase in connections that individuals are expected to adhere in terms of both organizational information technology (system) and workplace itself. This paper provides insights into the different organizational expectations in terms of connectivity and cultural values in two different contexts, South Korea (hereinafter Korea) and New Zealand. Globalization has increased the need for both individuals and organizations to recognize the different cultural expectations in diverse contexts. In particular, the development of technology has helped organizations to work with firms across countries and time zones, but also improved the mobility of individuals in terms of choice of work. Furthermore, the development of mobile

Information and Communication Technologies (ICTs) [Cahir and Lloyd, 2015; Sias, 2008] accelerated the need for individuals to understand the different expectations that their organization and organizational members have, in communicating about work and workplace relationships. These changes create new social norms and expectations which in turn change the existing dynamics within interpersonal relationships at work [Sias, 2008]. This rise of new norms and expectations is becoming especially visible in contemporary psychological contracts - a concept used to understand workplace relations [Rousseau, 1995].

Psychological contracts are, however, highly variable as they reflect changes within the expectations of the wider culture and society that an organization is based in. This paper attempts to provide insights into the relationship between connectivity, cultural context, and psychological contract, by examining New Zealand and Korean

organizations. As connectivity and psychological contract is a subjective phenomenon that may create different meaning for each individual, we use 76 semi-structured interviews of organizational members across six different organizations, in order to provide a rich, qualitative data. This paper asks the overarching research question, *what are the perceptions on connectivity (via psychological contracts) in Western versus Confucian workplace contexts and what are the implications of the resulting behaviors for organizational studies?*

2. Literature Review

This section reviews existing literature on connectivity and psychological contract especially those based on Western perspectives. Confucianism and cultural contexts that are based on Confucian values are also examined, and how these values may affect workplace expectations in terms of connectivity to work. Lastly, the potential differences between different cultural contexts in terms of connectivity and psychological contract are reviewed.

2.1 Connectivity

The concept of connectivity can be understood as the amount of how connection exists between organizations and technological devices [Collins and Kolb, 2013]. Connectivity is a broad and ambiguous phenomenon, and therefore connectivity includes the relationship between individuals, organizations, and the devices which enable a state of connectivity. Kolb [2008] provides a multidimensional definition of connectivity:

The mechanisms, processes, systems, and relationships that link individuals and collectives by facilitating material, informational and/or social exchange. It includes geo-physical, technological, as well as social interactions and artifacts [Kolb, 2008, p. 128].

With the increased number of connective devices that provides constant connection to work and people related to work, many workers are now considered to be in a state of near-constant and ubiquitous connectivity [Wajcman and Rose, 2011] in and around organizations. The use of ICTs especially mobiles modes such as smartphones serve as a form of artifact [Schein, 1984] that leads to an expectation and ability for a person to be constantly connected to both work system and co-workers. However, connectivity is ambiguous as every individual has their own perception of what optimal

connectivity looks like, which suggests that different workers would require different levels of connectivity to be their most productive self.

Establishing an appropriate level of connectivity that allows individuals to maximize performance (work and social) is considered as *requisite connectivity* [Kolb et al., 2008]. While this state of connectivity is most ideal for organizations and individual workers, the ubiquitous nature of mobile ICTs individuals are starting to feel that they are too overloaded and connected, which is known as *hyper-connectivity*. In contrast, low or insufficient connectivity with regards to situational (work and social) needs is known as *hypo-connectivity* [Kolb et al., 2008]. Although individuals can usually (or believes to) control their level of connectivity, the new norms and expectations in organizations are creating pressure to maintain an almost constant connection to work. While this constant connection may seem inevitable alongside the changes of the digitalized modern society, extensive connectivity may result in ineffectiveness, distraction, and burnout for workers [Atchley, 2010; Carr, 2010]. Therefore, organizations experience a dilemma of maintaining connectivity for work purposes but also having the need to limit connectivity to prevent such negative effects.

As perception towards having the ‘right’ connectivity is subjective, individuals and their associated workplaces (and workplace relationships) require and expect different levels of connectedness in conducting day-to-day tasks, thus the state of requisite connectivity may differ for each organization, groups, and individuals [Kolb et al., 2012]. Therefore, this subjective nature of connectivity perception means that the expectation crafted between interacting organizational members, and the individual’s perception towards such expectations may establish unique contexts to which requisite connectivity may be achieved.

2.2 Connectivity and psychological contract in ‘Western’ literature

Psychological contracts are certain expectations that individual have for each other in terms of communication and behaviors within a dual relationship [Coultrup and Fountain, 2012]. As these expectations are implicit and can change over time issues can easily arise. One of the biggest shifts in psychological contract expectations in contemporary Western organizations is the increasing

pressure for employees to be continuously connected to work regardless of the time of day or night [Peters and Allouch, 2005]. This pressure creates a number of implications for individual employees and their organizations. Psychological contracts are considered to be important from an organizational perspective, as they include aspects such as productivity, workload, and Work-Life Balance (WLB) [Conway and Briner, 2009; Schalk and Roe, 2007].

Rousseau [1995] suggests that employees and organizations are more productive if psychological contract expectations are fulfilled. However, some manager-employee relationships can experience mismatched expectations and create discrepancies which can lead to individual resentment and result in counterproductive behaviors [Anderson and Schalk, 1998; Rousseau, 1995]. The potential mismatch between work expectations within the organization seems to be heightened through the development of mobile ICTs, such as smartphones and tablets. These devices have become deeply integrated into the daily lives (both personal and work) of individuals, changing expectations within work relationships [Peters and Allouch, 2005; Wiberg, 2005]. Due to these developments, individuals are now more connected to work.

This issue is particularly difficult to negotiate between organizational members, as psychological contracts may not be explicitly discussed between the associated individuals, which may lead to unintended confusion and conflicts. This means that organizational members may experience difficulties in maintaining effective WLB regardless of their intentions. Greenhaus and Singh [2003] defines WLB as the level of involvement and satisfaction an individual experience with their family and work role. However, Kalliath and Brough's [2008] review suggests that the term WLB is widely employed, and is broadly idealized to discuss the multiple roles (including work related role) of individuals which may relate to family and/or other personal aspects of life. WLB is subjective [Kossek et al., 1999] and may be perceived as a contextual and social construct [Drobic and Guillen, 2011]. Therefore, this increases the uncertainty and ambiguity in how the increased connectivity expectations restructures and impacts psychological contracts between organizational members, as it is difficult to identify what the right 'balance' in WLB may be for each individual. In particular, negotiating such expectations even more

complex in non-Western contexts, where the ideas of work and workplace relationships are built upon different cultural values and assumptions, such as Confucianism.

2.3 Confucian culture and workplace expectations

Confucianism is a philosophy of ethics that originates from the Chinese scholar Confucius. Confucianism values the idea of harmony, hierarchy, and authority, where natural hierarchy between individuals is believed to maintain peace and order within the society [Clark, 2000; Yao, 2000]. Therefore, cultures that are influenced by Confucianism emphasize respect and harmony amongst individuals [Yao, 2000]. Korea is one of the East Asian countries that are strongly influenced by Confucianism [Deuchler, 2002], and this societal values and beliefs are also often transferred into organizational context [Kim and Rowley, 2009]. Therefore, worker relationships and expectations towards the behavior of employees are based on the complex blend of Confucian values from the wider Korean society [Adler and Jelinek, 1986; Shim et al., 2008] and the associated organizational culture [Ashforth and Mael, 1989].

The interdependent relationship structure based on the idea of harmony builds a strong sense of community amongst individuals. Each person is prescribed a role in relation to one another, and fulfilling such expectations based on these roles is crucial to construct and maintain a sense of group harmony [Oh, 1991]. In this process, individuals are expected to accept and abide to the group norms, regardless of one's own personal interests [Zang and Seo, 2016]. Within the organizational context, the role of superiors (managers) and subordinates are clearly divided through both social norms and organizational systems [Rowley, 2013]. Obedience to superiors and organizational norms means that individual workers, especially those at lower hierarchical levels are put under pressure in terms of work expectations, but also interpersonal based expectations [Kee, 2008]. This includes work boundaries and work hours [Kim et al., 2018], where these expectations are rather socially constructed within a superior-subordinate relationship. The existing Confucian values and norms may be extended through the use of technological devices and thus supporting expectation towards workers' ability to stay connected to work and also working for longer hours [Kim and Park, 2003].

Kim et al.'s [2018] study of working hours in Korean workplace contexts show that individuals within this study

perceive long working hours positively. This is due to the cultural values driven by the Confucian-based national culture, where the strong sense of interdependency and sensitivity to group relationships influence individual workers to perceive that long working hours are necessary, for the sake of the group. This implies a different interpretation to how individuals may perceive constant connectivity, as the underlying cultural assumptions that craft workplace expectations differs to Western contexts.

2.4 Connectivity and psychological contract across different cultural contexts

The intrinsic meaning that different cultural context has on the idea of psychological contract seems to differ, across those in Western cultural contexts and Confucian contexts which may have important implications for cross-cultural management. The strong Confucian values of hierarchy and harmony amongst group members mean that the technologically mediated continuous connectivity might not have a dramatic impact on the existing social expectations in Confucian organizations. However, this pressure may create issues for employees in Western organizational contexts that hold more individualistic values, where the new norms to stay continuously connected to work can clash with the desire to maintain work and personal spheres separate. Furthermore, Thein, Currie, and Austen [2006] suggest that WLB dilemma is a cultural process, and thus the resolution of this conflict may be influenced by power relationships and cultural contexts, especially between East and West. This is an important perspective when approaching the idea of connectivity and the associated impacts it may have on organizational members from diverse cultural backgrounds. These differences and potential implications are explored in our qualitative research study using the following methodology.

3. Methodology

3.1 Multi-voiced interpretivist approach

The data analyzed in this paper is drawn from two different sets of research. The first set of data is from a study of three New Zealand companies, and the second set of data is from a study of three Korean companies. A qualitative research approach was adopted to address the research question, and provide new insights to the relationship between connectivity, psychological contracts, and culture. The ideas of connectivity, psychological contract [Rousseau, 1995], and perceptions

and behaviors towards WLB [Xiao and Cooke, 2012], are contextual phenomenon that may be interpreted differently by each individual. This means its meanings may change depending on the context, and we adopt a multi-voiced interpretivist approach [Cunliffe et al., 2014; Alvesson, 2010] to explore multiple interpretations of connectivity and psychological contract, and its impact on organizational life across different cultural contexts. While this approach helps to investigate diverse interpretations with regards to connectivity and psychological contract across different cultures, this qualitative study does not attempt to generalize the findings, and we acknowledge that these findings are subjective, and that individuals' views may change over time [Halford et al., 1997]. Therefore, this research intends to provide insights to the complexities of connectivity in organizational life, by illustrating unique perceptions and rich descriptions of the studied companies [Bryman and Bell, 2015].

3.2 Data collection method

In-depth semi-structured interviews are used to capture the individual perspectives towards connectivity and psychological contract, and follow-up (impromptu) questions were also asked to gain further insights into specific topics or ideas raised in the interview. The participant companies and the individual interview participants that appear in this paper have been re-named using pseudonyms for anonymity and confidentiality purposes. The participant companies have been re-named Mintrack, Truscene, Wisepath, Connectigen, Kwikprax, and Noilos.

The six participant companies display unique characteristics and culture, where the companies are of different sizes and from diverse industries including private and public organizations. Table 1 below summarizes the participant companies examined in this study, and provides details on company's size and organizational hierarchy levels.

Insert Table 1 about here

Research in New Zealand companies was conducted in English, and research in Korean companies was conducted in Korean language. Engaging in interviews using the common or native language of the research participants helped both the researcher and the participant to carry out in-depth discussions more smoothly [Temple and Young, 2004]. Detailed information with regards to the research was provided to all research participants

prior to the interviews, and participant was voluntary. A total of 76 interviews were conducted across the six participating companies, and therefore, we acknowledge that the demographics of the interview participants are not (proportionately) representative of the six participant companies. Questions with regards to the idea of being connected to work, other organizational members, and work-related expectations within and outside the workplace were discussed in the interview. Research participants were all provided with contact details of the researcher, so that participants were able to provide further details (or change in their perspective) on interviewed topics at a later point in time. Table 2 summaries the demographic details of the 76 interview participants.

Insert Table 2 about here

The two sets of data were analyzed using thematic analysis [Braun and Clarke, 2006]. Themes and categories were created which focused on individual's perceptions and expectations towards WLB. Similarities and differences in key words and associated meanings across and within the two data sets were examined carefully. Interview excerpts that support or sometimes provide alternative interpretations to certain ideas were investigated, thus providing a cross-cultural perspective to psychological contracts in terms of connectivity to work. Data analysis was repeated in multiple stages. Initial analysis was conducted during the data collection period, followed by investigating the collected data within each of the participant companies after the data collection period. Then the data across the companies in each cultural context (New Zealand and Korea) were examined separately, and lastly all six companies' data was organized and combined using NVivo. This process generated three different themes, to provide different interpretations across New Zealand and Korean organizational contexts. These themes are: *connectivity stress*, *(non) contradictory behaviors*, and *informal relationships*.

The first theme *connectivity stress* discusses how the expectation and experience of being connected to work creates some sort of stress or non-stress for individuals. The emerging codes that commonly surfaced in both sets of data (New Zealand and Korea) related to the existence of connectivity expectations at work. However, codes referring to how individuals respond (and abide) to such expectations differed based on the cultural norms and what was considered as 'normal' in their workplaces. The second theme *(non) contradictory behaviors* discuss the

ambiguity and confusion created by the conflict between verbally shared connectivity and WLB expectations and actual work. New Zealand dataset displayed codes that relate to confusion and frustration from their inability to separate work and non-work life. However Korean dataset displayed codes that relate to consistent connectivity expectations between organizational members, based on the idea of harmony and interdependency. The last theme *informal relationships* discuss how the experience of constantly connecting with other organizational members may lead to development of personal relationships (such as friendship or family-like relationships) and thus merging work and non-work dimensions in terms of interpersonal relationships.

4. Discussion and implications

Development of technology has increased both connectivity and the complexity behind the integration of work and non-work dimensions of life. This study suggests that while the behavioral outcomes (such as responding to work afterhours) towards workplace connectivity across the studied New Zealand and Korean organizations may seem similar, how individuals interpret such expectation may differ according to the cultural context.

Contemporary workplaces in the Western contexts are increasingly valuing employee behaviors such as hyper-connectivity and flexibility [Cavazotte et al., 2014; Hadley, 2007]. The studied New Zealand organizations suggest that while individuals recognize that there is a need for a divide between their work and personal life; this is difficult due to the existence of ICTs, and also due to the inconsistent behaviors of their managers. This inconsistency creates further stress, as managers say that they want workers to have WLB but their behaviors do not reflect this. Such contradictory messages create ambiguity and subjectivity, which can increase discrepancies in psychological contracts [Dabos and Rousseau, 2004] and result in breach or violation of the contract. Violating the contract, whether intentionally or not, can lead to negative consequences like job dissatisfaction, a lack of effort and reduced willingness to participate in organizational citizenship behavior [Lester et al., 2002].

Another finding from New Zealand organizations was that while individual want to create work-life balance, they are unable to do so. This extends previous studies that emphasize personal agency and how individuals can exercise it to control their connectivity levels

[Obushenkova et al., 2018]. In the current study, due to increasing pressure to stay connected to work, participant responses suggest that they no longer have personal agency to create work-life balance, which can further create problems for psychological contract fulfillment and maintenance.

Furthermore, data from New Zealand organizations also suggests that work-life dimension is also blurred through informal communication (especially via texts), and this informality was perceived to develop more casual relational expectation between communicators. Therefore, participants in this study suggested that constant connectivity allowed more personal relationships (sometimes described as friendship) to be developed between organizational members, regardless of their organizational position, and thus blending the boundary of work and non-work life. This supports Sias and Cahill's [1998] research on identifying the peer friendship development process in the workplace, where frequent and informal communication are observed between, and helps to further develop more intimate friendships between coworkers. This also extends the idea of interpersonal connectivity [Kolb, 2008], where the use of connective communication devices helps professional and personal relationships to merge, and thus developing intimacy and community [Fay, 2011] between individuals.

In contrast, the studied Korean organizations suggest that the development of ICTs do not create further stress for individuals in terms of maintaining their WLB. This is because the underlying Confucian values of harmony and interdependency [Clark, 2000; Yao, 2000] already establish expectations to stay connected to work and respond to work matters if requested by their managers. This embedded cultural value is also reflected through long working hours [Kim et al., 2018], and thus suggests that while individuals may be stressed from the extra work, this is not considered abnormal. There may be no significant desire or attempt to balance their work and life, but rather consider it as a way of being respectful towards the company and contributing to the group [Kim et al., 2018]. Behaviors of managers in the Confucian context also reflect and further encourage this natural expectation.

Findings from the studied New Zealand and Korean organizations suggest that different cultural interpretation to organizational relationships may influence perceptions towards WLB. While the studied New Zealand companies suggest that development of 'friendship' like

organizational relationships provides a feeling of comfort in being connected to work colleagues, Korean examples implied a much deeper integration of work and non-work dimensions of life, based on the Confucian cultural idea that all society and groups are structured similar to a family [Shim et al., 2008]. This difference in underlying relationship structure may help to explain why individuals in different cultural contexts may respond differently to connectivity expectations, and approach the idea of WLB differently.

These expectations and behaviors create certain implications for theory and practice. Firstly, this research extends psychological contract research in terms of connectivity and WLB expectations across two different cultural contexts, suggesting that contract breach or violation is more likely to occur in Western contexts due to the ambiguous and contradictory nature of connectivity and WLB expectations. In terms of practice, this research suggests that managers need to be aware of the cultural differences as these can lead to different outcomes for employees. As Confucian employees are less likely to speak up about WLB expectations violation (due to the need to preserve harmony) they may, as a result of working overtime, experience higher levels of technostress and burnout [Barley et al., 2011; Richardson and Benbunan-Fich, 2011], which contribute to absenteeism and lowered productivity.

5. Conclusion

This study has set out to explore and compare psychological contract expectations and behaviors in terms of connectivity to work and WLB in Western and Confucian cultural contexts. It suggested that not only do individuals in these two contexts hold different perceptions about psychological contracts and WLB but they also, as a result, can experience different outcomes. The study makes an original contribution to the field of organizational studies and international management by being one of the first studies to examine the cultural influence on psychological contracts expectations about connectivity and WLB across six organizations situated in New Zealand and Korea.

Although this research finding is not generalizable due to its qualitative and non-longitudinal nature, they provide important insights into employee perspectives and experiences across a wide range of organizations and industries in two highly contrasting cultures. Future

research could expand on the findings of this study by focusing specifically on middle-managers in New Zealand and Korea, as hierarchical levels within organizations can have a significant influence on individual perceptions, behaviors and outcomes in terms of their connectivity and work-life balance. The take-away message from this study is that managers, especially in cross-cultural or international organizations, need to be clear about their connectivity expectations and not engage in contradictory behavior to avoid creating negative outcomes for their employees, and by extension for their organizations.

This research has various limitations. First the qualitative nature of this research means that the findings from this study may not be generalizable to all New Zealand and/or Korean workplaces, and may be limited to the perceptions of the studied companies. Second, only a total of six companies were investigated across two cultural contexts (New Zealand and Korea). Collecting data from a larger number of companies may help to develop more reliability in the findings of this research. Third, conducting a longitudinal study may help to gain further insights into connectivity and psychological contracts across different cultural contexts, by reflecting the change of individual's perception in multiple points in time. Last, the researcher's own interpretations and beliefs may influence the presentation of the findings, as this study adopted an interpretative approach to examine the phenomenon of interest. However, the adopted methodology considers the researcher to be embedded in the research context [Alvesson, 2010], and thus we acknowledge the subjectivity of this process. Although these limitations are acknowledged, this study was still able to explore the relationship between connectivity, psychological contracts, and WLB across New Zealand and Korean organizations. By further developing upon these approaches, future research may explore and contribute to analyze the issue of connectivity within diverse workplace contexts.

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<Table 1> Summary of participant companies

Context	Company	Industry	Size	Levels of organizational hierarchy
Korea	Mintrack	Online Gaming	33	8
	Truscene	IT	49	7
	Wisepath	Manufacturing	63	10
New Zealand	Connectigen	IT	180	4
	Kwikprax	Trade union	40	3
	Nomilos	Governmental	3,000	7

<Table 2> Summary of interview participants

Context	Company	No. of interview participants	Gender	Age range	Hierarchical status
Korea	Wisepath	7	5 male, 2 female	Early 30's to mid 60's	4 staff (level 1), 2 deputy managing director (level 7), 1 managing director (level 8)
	Mintrack	14	10 male, 4 female	Mid 20's to early 40's	6 staff (level 1), 1 manager (level 2), 2 deputy section chief (level 3), 3 section chief (level 4), 1 deputy department manager (level 5), 1 department manager (level 6)
	Truscene	25	20 male, 5 female	Early 20's to mid 40's	10 staff (level 1), 5 manager (level 2), 3 deputy section chief (level 3), 3 section chief (level 4), 2 deputy department manager (level 5), 1 department manager (level 6), 1 senior management (level 7)
New Zealand	Connectigen	8	4 male, 4 female	Early 20's to late 40's	6 staff (level 1), 2 manager (level 2)
	Kwikprax	11	6 male, 5 female	Early 20's to early 70's	9 staff (level 1), 1 manager (level 2), 1 senior management (level 3)
	Nomilos	11	6 male, 5 female	Early 20's to mid 60's	10 staff (level 1), 1 manager (level 5)

Satisfaction Differences between Relaxing and Exciting Flow States

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Abstract

Nowadays, people stick on the Internet even after work, the hedonic features of a website are as important as functional features. The user-related website using experience has noticed by website usage studies in recent years. This study examined flow in exciting and relaxing states and their influences on satisfaction, which might differ between goal-oriented and behavior-oriented users. Clustering analysis and t-test were used to divide and compare groups. There were 175 (51.47%) male users and a total of 340 respondents. The results showed that the goal-oriented users were significantly satisfied at the exciting flow state and behavior-oriented users were significantly satisfied at a relaxing flow. However, both goal and behavior-oriented users spent more time in an exciting flow state.

Keywords

Exciting flow, relaxing flow, satisfaction, flow theory, goal-oriented, behavior-oriented.

1. Introduction

Studies in many fields have discussed satisfaction with website functionality (Gefen, Karahanna, & Straub, 2003; LaLomia & Sidowski, 1990; Moon & Kim, 2001). However, present people stick on the Internet even after work, the hedonic features of a website are as important as functional features (Lu, Zhou, & Wang, 2009; Van der Heijden, 2004). Thus, the various oriented usage causes various attracting websites to be developed.

When users surfing online with purposes, they would like to achieve their task as soon as possible (Lee, Rhee, & Dunham, 2009). However, if their goal was completed or disappeared, providing more behavior opportunities was good for keeping users staying (Mackenzie, Hodge, & Boyes, 2011). Website users spent plenty of time on the Internet and surfed from a website to another. Extrinsic motivation forces users to adopt a website, but intrinsic motivation is good for arousing the interest of users, which makes them stay longer and willingly (Plotnik & Kouyoumjian, 2011). Why website user wants to stay on a website is important. Thus, understanding the theory of how intrinsic motivation be aroused for both with purpose and purposeless users is also an important issue.

Previous studies suggest that the website usage can be

discussed in both goal-oriented and behavior-oriented motivations (Apter, 1982, 2007; Deng & Scott, 2010; Gupta & Kabadayi, 2010). Apter (2007) thinks that people doing things with goal-oriented and behavior-oriented behaviors. Gupta and Kabadayi (2010) indicated that website users with goal-oriented motives highly valued the use of websites, whereas users with behavior-oriented motives focused more on feelings and experiences. However, except for the usefulness and enjoyment of a website which many studies had discussed (Lippert & Volkmar, 2007; Rouibah & Hamdy, 2009), website design is also a significant effect of user experience. Accordingly, this study tried to use the balance ratio between the challenge and the coping skill, which a website providing to explain the arousing theory of intrinsic motivation. This theory could explain how to optimize usage experience and cause better website satisfaction. This objective of this study compared the difference between two states by discussing relationships among satisfaction, behavioral intention, and actual user behaviors

2. Literature Review

A successful website satisfies its users. Most researchers would agree that a positive user experience increases satisfaction and the user's intention to visit the website

repeatedly (Bhattacharjee, 2001; Gefen, 2000; Gefen et al., 2003). Some studies have tried to understand website usage by experiential quality (Castaneda, Munoz-Leiva, & Luque, 2007; Richard, Chebat, Yang, & Putrevu, 2010; Skadberg & Kimmel, 2004). As such, the notion of a quality experience has become an important issue (Castaneda et al., 2007; Doolin, Dillon, Thompson, & Corner, 2005; Richard et al., 2010). Flow theory offers a sound theoretical basis for studying optimal user experience (Castaneda et al., 2007; Jeong, Fiore, Niehm, & Lorenz, 2009; Thatcher, Wretschko, & Fridjhon, 2008). Many researchers have suggested that flow theory helps increase our understanding of user behaviors while using the web (Chen, Wigand, & Nilan, 1999; Hoffman & Novak, 1996; Novak, Hoffman, & Yung, 2000); however, only few studies have discussed the weight difference between challenge and skill on website usage and satisfaction, and none study has discussed them within the goal and behavior-oriented motivations. The following sections detail flow theory and the relationship between flow and motivations.

Flow theory

Flow is a status obtained when the user focuses his or her full involvement in the moment when they do something (Hausman & Siekpe, 2009; Snyder & Lopez, 2009). Csikszentmihalyi (1975) examined the nature and condition of flow in a series studies on intrinsic motivation and found that the occurrence of flow depends on the balance between challenge and skill. The conditions for entering flow include the perceived challenges that stretch, but do not overmatch existing skills, clear proximal goals, immediate feedback, focused concentration, merging of action and awareness, loss of reflective self-consciousness, a sense that one can control self actions, distortion of temporal experience, and experience of the activity as intrinsically rewarding (Snyder & Lopez, 2009). Of note, optimal experience has been used as a predictor of satisfaction to explain the flow since 1989 (Csikszentmihalyi & LeFevre, 1989; Koufaris, 2002; Liu, Liao, & Pratt, 2009; Lu et al., 2009).

To perceive flow, it must contain a balance between challenges and skills. Challenge refers to opportunities for action and the skill refers to one's abilities to cope with the challenges at hand (Csikszentmihalyi, 1990). If challenges exceed skills, one will feel vigilant, but, subsequently, feel anxiety and frustration. On the contrary, if skills exceed challenges, one will feel relaxed and, subsequently, bored

(Csikszentmihalyi & Csikszentmihalyi, 1975). The ratio between the challenge and the skill offers the key to an understanding of flow states. Anxiety and boredom would force people to adjust their level of challenges and skills to escape uncomfortable feelings (Csikszentmihalyi, 1990).

In 1997, Csikszentmihalyi (1997) indicated that flow could be perceived not only in an exciting state, but also a relaxing state. Exciting flow means the challenge is perceived higher than skill, but the challenge is conquerable. Relaxing flow means the challenge is slightly lower than skill and the challenge is controllable (Csikszentmihalyi, 1997). This means that people might perceive flow in both relaxing and exciting situations.

Flow and Motivations

Both of the exciting flow and relaxing flow would arouse flow experience; however, which situation would make the optimal experience for users need to be detailed.

A motivational state is a mental condition that includes basic psychological motives that people experience (Kent, 2006). These motives exist as opposite pairs such as goal-oriented and behavior-oriented (Fox, 2009). Gupta and Kabadayi (2010) indicated that website users who have a goal-oriented motive expect websites will have the capabilities to complete tasks efficiently, but users with experiential motives expect more emotional feedbacks from a website using process. This means that goal-oriented users would more easily accept technologies that contain higher perceived ease of use and perceived usefulness because they prefer completing tasks with minimal effort (Lee et al., 2009). On the contrary, people with behavior-oriented behaviors prefer seeking feedbacks or rewards from processes instead of results (Deng & Scott, 2010; Fox, 2009).

Mackenzie, Hodge, and Boyes (2011) studied flow states in goal-oriented and process-oriented behaviors in advanced activities (e.g., river surfing). They provided some evidence that different motives expect distinct flows (Mackenzie et al., 2011). They also indicated that serious players and playful players were satisfied by different flow states.

Apter (1992) suggested that behavior-oriented people prefer excitement and enjoy processes more than results; therefore, they expected to have a flow experience that is more frequent, obtain immediate feedback, and focus on the immediate task (Apter, 1992). However, goal-oriented

people need to have more control and conserve energy of flow to coincide with their optimal performance because more controllable situations increase their confidence (Mackenzie et al., 2011; Nakamura & Csikszentmihalyi, 2009).

According to above discussions, people who want to complete their task with minimal effort and with more control would expect the entire process to be less challenging and smoother. People who enjoy the process and less focus on results would expect it to be equally challenging and require greater skills. Therefore, this study discussed the distinct flow for goal-oriented and process-oriented using purposes.

This study model proposed that the flow would affect satisfaction and the actual using them directly. The flow state would be conducive to an optimal using experience to increase their satisfaction (Csikszentmihalyi, Larson, & Prescott, 1977). Furthermore, the flow state would involve the user fully, would require concentration, and make users forget the time that has elapsed; therefore, it would stimulate users to spend time on Facebook. Accordingly, this study developed the following hypothesis and conceptual model.

Hypothesis 1: The flow experience directly affects satisfaction and actual usage time of website users.

Furthermore, according to the above discussions on flow and using purposes, this study proposed additional hypotheses and a conceptual model.

Hypothesis 2: For goal-oriented purpose users, relaxing state of flow will encourage higher satisfaction and more time will be spent on websites.

Hypothesis 3: For behavior-oriented purpose users, exciting state of flow will lead to higher satisfaction and more time will be spent on websites.

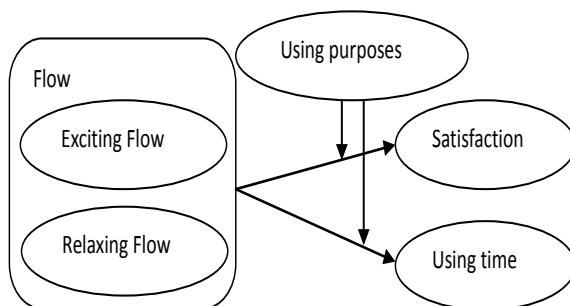


Figure 1 Conceptual Model

3. Method

2.1 Procedure

This study designed two situations to control two orientations of participants.

For behavior-oriented situation, they received an instruction like to follow:

"This is a program improving survey, which cooperates with the Candy Crush game on Facebook. Many thank for your contribution for helping us. You will see an application software which is attached in this email. Please install it. This software will then monitor the program working of Candy Crush and report them to us. This software will not monitor and record any usage and personal information about your account, please feel free to install it. After installed, please play the Candy Crush at least five minutes. In order to understand the distinct situation of each player, please fill up a questionnaire before you leave the game. We will tell you how to uninstall the software and the result of this survey."

The program improving scenario is for giving a motivation to respondents without asking any outcomes. Asking no outcome in this survey is good for making respondents immerse in process without goals. The monitoring program installation could let respondents to keep focus on this survey; however, this program did not really monitor, but reminds respondents to fill in the questionnaire of this study.

For goal-oriented situation, they received an instruction like to follow:

"This is a Candy Crush competition game. Please try to get the highest score as you can. You need to play at least five minutes. Each player submits an image of the highest score to us. The three highest scoring players will receive a gift from us."

The competition scenario is for giving a specific purpose to respondents. Respondents completed this game with a specific goal. After they submitted their scores, they were asked to fill in the questionnaire of this study. All respondents no matter what orientations, will get a detail truth of this study when they leave this survey. The three highest scoring players also received a prize for each, which sent by post.

2.2 Operational definition

The proposed model discusses the relationships between flow, satisfaction, and actual usage time. Flow is a cognitive state that is experienced during navigation and is defined as "a full involvement state when people act

upon their behaviors” (Csikszentmihalyi, 1990; Hausman & Siekpe, 2009). Satisfaction is defined as “a satisfied state following website usage.”

Flow was measured with a 3-item scale that included “When I was using this website, I felt totally captivated,” “When I was using this website, time seemed to pass very quickly,” and “When I was using this website, I feel that I immersed in it.” This study examined the reliability and validity of the flow questionnaire by assessing the balance between skills and challenges. Three skill items included “I am very skilled at using this website,” “I consider myself very knowledgeable about this website well,” and “I know how to find what I am looking for this website.” Three challenge items included “Using this website is a great challenge for me,” “Using this website provides a good test of my skills,” and “Using this website pushed me to perform to the best of my ability.”

Satisfaction was measured using a 3-item scales that used Likert 7-point scale. A sample question for satisfaction is, “I satisfy with this website” The final questionnaire inquired about the amount of time users actually spend on Facebook, which was assessed by the amount of hours per week and ranged from 0 to 168.

2.3 Sample

Half of the respondents of this study were from a convenience student sample recruited from a Taiwan university. The remaining questionnaires were Internet users to ensure that there was no homogenous sample bias from the student sample.

All participants, 340 (85%) respondents, completed the questionnaires. Of the respondents, 175 (51.47%) were male and 165 (48.53%) were female.

2.4 Reliability and Validity

Cronbach’s alpha analysis was used to test the reliability of each scale. The results indicated reliabilities of 0.88 and 0.85 for flow and satisfaction, respectively. Table 1 shows the convergent validities as indicated by the loadings that emerged from the confirmation factor analysis (CFA), Composite Reliability (CR), and the value of average variances extracted (AVE). The CFA loading needs to higher than 0.7 (Bagozzi, Yi, & Phillips, 1991). The CR value of 0.7 or higher is acceptable (Fornell & Larcker, 1981). The value of AVE should be 0.5 or higher (Fornell & Larcker, 1981). Table 2 shows the discriminant validities, which were calculated by the shared variance

between the variables to verify that it was lower than the average variances extracted for the individual dimensions (Fornell & Larcker, 1981).

Table 1. Results of Convergent Validity

	Loading	CR	AVE		Loading	CR	AVE
FL1	$\lambda=0.895$	0.88	0.71	SAT1	$\lambda=0.793$	0.78	0.55
FL2	$\lambda=0.781$			SAT2	$\lambda=0.863$		
FL3	$\lambda=0.934$			SAT3	$\lambda=0.751$		

FL: flow; SAT: satisfaction;

Table 2. Results of Discriminate Validity

	FL	SAT
FL	0.71	
SAT	0.06	0.55

FL: flow; SAT: satisfaction;

The diagonal were the value of average variance extracted.

4. Results

3.1 Samples

All respondents had experience in playing Candy Crush, which Facebook provides. Most respondents ranged from 20 to 30 years of age. The educational level of the participants was mostly higher than college, although few were high school students. The average time surfing on the Internet was 7 hours per day, 6 days a week. The average time spent on Facebook was 2 hours per day, 5 days a week. Facebook usage revealed that over 300 participants used Facebook for communication and over 200 participants used it to play games. Table 3 shows the details of participant distribution. Female users showed significantly higher flow compared to male ($t = -4.86$, $p = .000^*$); there were no other significant Facebook usage differences between gender.

Table 3. Description of samples

Item		Cas-es	%	Item		Cas-es	%
Gender	Male	175	51.47%	Career	Students	240	70.59%
	Female	165	48.53%		IS/ IT industry	50	14.71%
Age	Under 20	9	2.65%		Finance industry	6	1.76%
	20-24	180	52.94%		Service industry	9	2.65%
	25-29	118	34.71%		Manufacturing	5	1.47%
	30-34	27	7.94%		Education/Cultural	16	4.71%
	Over 35	6	1.76%		Others	14	4.11%
Facebook using purposes (multiple choice)							
Leave a message to friends		235	69.12%	Play games		207	60.88%
Follow how friends going		305	89.71%	Do psychological test		107	31.47%
	Others	9	0.29%				

3.2 Skill and Challenge

According to flow theory, flow occurs when challenges and skills are in balance (Snyder & Lopez, 2009). Table 4 summarizes the validity of self-reported flow by challenges and skills. The results indicated that skills, challenges, and flow items are significantly correlated.

Table 4 description of samples

SK and CH items Flow items	SK1	SK2	SK3	CH1	CH2	CH3
Flow Item 1	0.417 $p=0.000$;	0.286 $p=0.000$;	0.201 $p=0.000$;	0.160 $p=0.000$;	0.248 $p=0.000$;	0.189 $p=0.000$;
Flow Item 2	0.467 $p=0.000$;	0.378 $p=0.000$;	0.325 $p=0.000$;	0.207 $p=0.000$;	0.322 $p=0.000$;	0.238 $p=0.000$;
Flow Item 3	0.394 $p=0.000$;	0.303 $p=0.000$;	0.226 $p=0.000$;	0.111 $p=0.004$;	0.242 $p=0.000$;	0.169 $p=0.000$;

CH: challenge; SK: skill

To test the hypotheses in this study, skill and challenge items were clustered into two groups (see Figure 2 and Table 5). Figure 2 shows that participants reported two different types of challenge and skill. Exciting status showed a similar degree of challenges and skills and relaxing status showed a lower degree of challenges that users had enough skill to cope with. The exciting status, as a previous study (Snyder & Lopez, 2009) shows, would be perceived when challenges and skills are in equal ratio. On the contrary, the relaxing status would be perceived when users stay in situations that they are able to handle. These two groups differed significantly in challenges and skills (see Table 5).

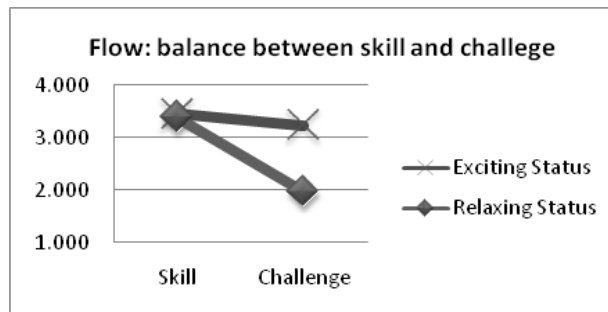


Figure 2. Skills and Challenges Clustering Result

Table 5. Skills and Challenges Clustering Numeric Result

	Skill	Challenge	
Exciting Status (n=186)	Mean=3.527; SD=0.677	Mean=3.263; SD=0.777	t=4.656; p=0.012
Relaxing Status(n=154)	Mean=3.306; SD=0.539	Mean=1.867; SD=0.434	t=31.240; p=0.000

After conducting a clustering analysis, this study used *t*-test to examine the influence of relaxing flow and exciting flow on satisfaction and time spent amount for the two types of usage purpose.

Table 6 shows that exciting and relaxing flow have different flow perception and actual time spend. Of interest, even exciting and relaxing flow has different flow perception, they have the similar satisfaction. This is an interesting result in this study. This means that the satisfaction would be perceived no matter which flow states is.

Tables 7 and 8 show the influences of exciting and relaxing flow in the goal-oriented and behavior-oriented groups. In the goal-oriented group, the satisfaction perception was higher under relaxing flow state. In the behavior-oriented group, the satisfaction perception was higher under the exciting flow state. However, the amount of time spent of both group was higher under the exciting flow than under relaxing flow state. Accordingly, hypothesis 1 were confirmed while hypotheses 2 and 3 were partially confirmed.

Table 6. Difference between exciting flow and relaxing flow

	Exciting flow(n=186)	Relaxing flow(n=154)	
flow	Mean=3.305; SD=0.841	Mean=2.960; SD=0.995	t=4.815; p=0.000***
Satisfaction	Mean=6.860; SD=1.828	Mean=6.776; SD=2.009	t=0.565; p=0.572
Using time (Hours a week)	Mean=14.148; SD=17.610	Mean=11.527; SD=10.214	t=2.405; p=0.016*

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 7. Difference between two statuses of participants with goal-oriented motivations

	Exciting Status(n=64)	Relaxing Status(n=65)	
Satisfaction	Mean=7.255; SD=2.180	Mean=8.049; SD=2.108	t=-2.446; p=0.015*
Using time (Hours a week)	Mean=15.940; SD=17.610	Mean=12.856; SD=10.214	t=2.232; p=0.000***

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 8. Difference between two statuses of participants with behavior-oriented motivations

	Exciting Status (n=27)	Relaxing Status (n=37)	
Satisfaction	Mean=7.295; SD=2.317	Mean=6.600; SD=2.442	t=2.041; p=0.013*
Using time (Hours a week)	Mean=10.612; SD=12.608	Mean=7.935; SD=7.870	t=2.232; p=0.047*

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

5. Discussion

Most previous studies have focused on how flow occurs (Engeser & Rheinberg, 2008; Nakamura & Csikszentmihalyi, 2009). But, rare of them discussed how the weight between skill and challenge influence on Internet usage under different motivations.

Not all users surf the Internet with specific purposes. Some users go online because they are bored (Koufaris, 2002; Rice, 2002). Thus, killing time and having fun motivates some people to hover on the web. Therefore, users might surf from a website to another website expecting to find something interesting. This type was the process-oriented user in this study.

Goal-oriented players in this study expect smooth, quick, and effective performance of their game in order to get the highest scores as soon as possible. This type of user prefers minimal effort (Fox, 2009), ordered display (Deng & Scott, 2010), and higher efficiency (Gupta & Kabadayi, 2010). The results of this study showed that goal-oriented players reported higher satisfaction in the relaxing flow condition. Therefore, they felt more satisfied when perceiving tasks as controllable. If they perceived too much challenge and felt that the tasks were uncontrollable, they might feel anxious and nervous (Apter, 2007; Mackenzie et al., 2011).

On the contrary, behavior-oriented players reported higher satisfaction in the exciting flow condition. This means that they feel greater satisfaction when they are challenged to arouse achievement and excitement. Of this group, a purposeless motivation motivated them to expect a good experience. Additionally, they enjoyed the process of gaming and the immediate feedback from this application. If they felt too easy in playing games, they might become bored quickly (Csikszentmihalyi, 1997). Therefore, it is important to provide new challenges to encourage achievement and strengthen satisfaction to keep the process attractive (Csikszentmihalyi, 1990).

In this study, both groups had significant differences in satisfaction, but they had no difference in the amount of time spent on CandyCrush. It is interesting that the amount of using time did not increase proportionally with the degree of satisfaction. A previous study indicated that performance and preference were distinct (Coll & Wingertsman III, 1990). Regarding flow conditions (Csikszentmihalyi, 1990), overmatching of existing skills, clear proximal goals, and immediate feedback are

the conditions that arouse flow. However, after arousing flow, flow users focus on concentration, merging of action and awareness, and losing reflective self-consciousness. These factors might directly strengthen further engagement in behaviors. Therefore, in an exciting flow state, goal-oriented users might be dissatisfied because of the arousing of anxiety; however, they still full immerse and focus until they are aware that they have spent too much time on the tasks.

Compared to exciting flow, relaxing flow had a more controllable feel in completing tasks. If relaxing flow users had specific goals to achieve, they could experience achievement from completing tasks (Engeser & Rheinberg, 2008); however, if they had no goal, they might become bored. Achievement and excitement would encourage users to continue their engagement in behaviors (Fox, 2009)

Accordingly, the exciting flow strengthened the time spent on Facebook, but relaxing flow and exciting flow resulted in optimal experience and satisfaction for goal-oriented and behavior-oriented users, respectively.

6. Theoretical and Managerial Implications

From a theoretical perspective, this study demonstrated that different ratios of challenge and skill effect different experiences and satisfaction levels. This study provided a new finding that using more time did not mean they were more satisfied. Players might spend too much time in gaming because they feel lost in reflective self-consciousness. For purposeless users, they might enjoy their becoming lost in reflective self-consciousness because they were attracted in the processes of forgetting and time passing. However, for goal-oriented users, they might become dissatisfaction because it causes them to waste so much time by arousing their reflective self-consciousness.

According to previous discussions, users like to gain optimal experience and satisfaction from a website, and website developers want users to use the site continuously. Therefore, websites should satisfy users to improve their well-being and provide benefits to compel users to return every day. So, website developers should well evaluate the weight of challenges and skills according to their target users and company strategies when they were designing their website.

7. Limitation and Future Development

The CandyCrush, which Facebook provides, was the object of this study because it is a popular game. The experiment in this study, which create two scenarios would best for manipulating their motivation orientation. However, users easy to switch their motivations between goal-oriented and behavior-oriented. It is worth further examining this study results in different ways.

Further study also could focus on differences between goal-directed and process-directed users concerning switching costs. These switch costs might be critical factors that determine users' loyalties.

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The Role of Design thinking in Dashboard Design: A Preliminary Study

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Abstract

To gain competitive advantage, it is insufficient to make a decision by intuition and expertise's experience. Data has become one of vital resources to drive business growth. Effective data analytics can support organizations to make unbiased and efficient decisions. There are various techniques which can be employed to analyze data. Yet data analytics may not be useful without an effective way to present insights of the analytics results. Dashboards is regarded as a tool for data representation. Right decisions can be made with the help of effective well-designed dashboards. This study explores the design thinking concept which is an approach for developing new innovative products and services. This concept is widely used to drive business transformation. The central tenet of this concept is similar to a user-centric design approach. It is hypothesized that the design thinking concept could help improve dashboard design practices by understanding deeply about needs of users and underlying reasons of their needs. Semi-structured interview will be used to collect opinions from dashboard creator, business analyst and business user about the adoption of design thinking concepts on dashboard design. The results will offer preliminary findings about the role of design thinking in designing business dashboards.

Keywords

Design thinking, Data driven decision making, Dashboard design.

Introduction

Data has become a most valuable asset to drive business growth and to gain competitive advantage. Better decision making with effective data analytics can support organizations to make unbiased and efficient decisions. Normally, the results from data analytics consists of large numbers. Traditional reports are used to display fixed-form reports, which can be business reports or analytical reports. Formally, data can be displayed in the form of tables and charts. Data analytics can provide more useful data-driven decisions with an insightful presentation of the analytics results. Data visualization is also an intuitive approach for reporting and communicating the real value or context of those numbers [1].

To arrange the insights of data analytics, data visualization utilizes visual elements like charts, graphs,

and maps in communicating information clearly. Dashboard is regarded as an effective tool for data visualization that provides an accessible way to perceive and understand trends, outliers, and patterns in data [2]. An effective dashboard is a delicate balancing presentation between form and function features. It has to provide the relevant information that covers all business user needs and also ease of use to create more persuasive rationale for adoption amongst the users. A well-design dashboard may help to give the ability to make a right decision [3]. Hence, it is essential to design dashboards by considering user's needs and insights.

With focus on user-centric design approach, design thinking is an approach that directly related with users and stakeholders. The main goal of design thinking is to get needs and insights from user by empathizing[4].

It is broadly used to develop new innovative products and services. The process of design thinking provides a solution-based approach to solving problems [5]. This methodology aims to reduce the ambiguity of user requirements by involving the customers or users on a series of prototypes to find, test and improve concepts.

With the extensive use of design thinking and the importance of data-driven decision making with dashboard, it is hypothesized that the design thinking concept could help improve dashboard design practices through understanding deeply about needs of users and underlying reasons of their needs. Therefore, this paper provides a review of design thinking stages and dashboard design procedure stages. Furthermore, this study attempts to explore how design thinking effects on dashboard design procedure stages by using semi-structured interview with dashboard creators, business analyst and business users. The results will finally demonstrate how design thinking can be applied to business dashboard design.

Background

This paper focuses on two concepts including design thinking and dashboard design.

Design Thinking

Design thinking concept is a human-centered approach that has been widely adopted in academia and practitioners around the world to ideate the process of creativity and innovation. World class companies including IDEO, Apple, Nike, IBM use design thinking to build commitment to a new idea [6]. Design thinking also applied in education. In Singapore, design thinking uses as a design methods and tools facilitate to a new way of thinking for primary school [7]. Design thinking refers to a variety of methods in mental and physical processes that assist firms achieve product and service design outcomes by integrating with business requirements. The notable model development by Stanford D. School articulates a five stages model including Empathy, Define, Ideate, Prototype and Test [8].

1. Empathize: the first stage in design thinking which is human centered. It is a design process to understand others by putting ourselves into other people's shoes. By sharing feeling with users, designers can engage themselves to participate and gain more insights about the problems.

2. Define: the second stage involves the definition of problems that leads to proper solution in the viewpoints of stakeholders. It is important for designers to focus on positive sides of solution to alleviate negative effects from the framed problems.
3. Ideate: the ideas should be brainstormed and collected as many as possible from relevant participants without pre-judgment in the third stage. Mind mapping, post-it notes, and sketch can be used to facilitate the process.
4. Prototype: the tangible solution or service model should be materialized in order to learn and adjust from users' feedback in the fourth stage. Prototype can be altered and reevaluated in few iterations to match the real users' needs and design feasibility.
5. Test: the five stage incorporates the testing which aims to understand user experience during the usage. Designers should be aware of the proper sampling of users as their thoughts and feelings about the solution are critical to suggestion and design direction.

Dashboard Design

The advancement of ICT in workstation and mobile computing and competitive pressures drive business users to make a decision with higher velocity and accuracy. Traditional reports with information overload from various information system within the enterprise no longer serve such purpose. Therefore, performance dashboards have been introduced as a solution for decision makers' cognitive fit. However, there are a limited number of literatures regarding performance dashboard characteristics in academic journal that reflect its efficiency and effectiveness in decision making. The review in the following section will cover dashboard features, dashboard user tasks, dashboard design process, dashboard decision making performance [9].

Dashboard is a visual representation of key performance information which is essential to decision making process. Dashboard in performance management assists decision making in financial control, quality control, sales performance, marketing response and so on. Dashboard features can be divided into two types comprising functional features and visual features. Functional features are what dashboard can do whereas visual features are how dashboard looks. Dashboard might cover functionality such as analysis capabilities including

association, forecasting, scenarios, etc. Its visualization should offer the cognitive fit for users incorporating the proper use of color, data-to-ink ratio, Gestalt design, etc.

Dashboard design process influenced by engineering guidelines comprises of five stages: diagnosis, requirement, template development, resource assurance, and implementation & evaluation. In the diagnosis phase, designers aim to understand current state and priorities by gathering information, definition from stakeholders with appropriate instruments. The second phase is to identify organization needs, user characteristics, functional and visual features, content for decision making. After that, template of dashboard is designed technically on how to collect data and generate the right information to users. Required resources for development are assured to make dashboard operationalized and managed such as update frequencies, required inputs, and desired outputs. The last stage involves implementation and testing to make the dashboard operational. Dashboard will be evaluated for its information relevance, decision making efficiency and effectiveness for improvement.

Dashboard user tasks are key success factors in design. User tasks involve domain knowledge, cognitive styles, and task complexity. Domain knowledge refers to knowledge for related decision making such as accounting, production, inventory. Cognitive styles are how to fit information presentation with user task and decision-making skills.

Dashboard decision making for performance management currently is based on balanced scorecard concepts which suggests users to categorize measures into financial and non-financial ones. Accuracy, consistency, confidence and speed in decision making is primarily affected by how information and symbols are processed to fit the problem spaces and goal achievement [10]H.

Research Method

The semi-structured interviews were conducted with three participants from the same company in Thailand. This company is in retail business that imports and sells daily products such as cookie, butter, and cheese. The company started its business since 1958. It continues to improve the business by using international applications such as SAP. In 2013, this company has initiated business intelligence (BI) system by implementing QlikView software. However, this BI project has to be terminated because of

costing and software end of life. In 2017, IT department implemented dashboard project using PowerBI to support business decision making. In the beginning of dashboard project, IT department encountered with numerous obstacles. For example, some dashboards were not used by end users and some portions could not entirely respond to the business requirements. Therefore, head of IT department arranged design thinking training to his staffs in order to comprehend user needs and insights. In this research, three participants who had an experience with dashboard project in different roles were interviewed.

Participant#1 is a dashboard creator. He works in IT department in this company for seven years and he is a key person in dashboard project. Last year, he attended design thinking training.

Participant# 2 is a business analyst who works in this company for six years with design thinking training. His job has to bridge between business problems and technical solutions.

Participant# 3 is a business user who uses dashboard regularly. She is an executive management without design thinking training.

Semi-structured interviews were employed to collect data from each participant. Each interview session took approximately 40 minutes and was guided by open-ended questions with some probe and prompt techniques during the interview. Follow-up emails and telephones were used to clarify the interview context. The interview guide was provided to all three participants prior to the interview session. The results from interview sessions are revealed into three parts. The first part, interview data regarding dashboard design without design thinking concept is presented. The second part, interview results of dashboard design with design thinking concept is obtained. The final part is recommendation and suggestion from participants.

Finding

The results were based on the interview transcripts and field notes to identify patterns and supported quotations. Before the interview was started, we explained them the objectives of this research and gave them dashboard design procedure stages including diagnosis, dashboard requirement, dashboard template definition, dashboard development and implementation [10]0. The finding was presented in Table 1 and Table 2.

Part 1: Without design thinking concept

The first session of interview, participants were informed to share us about implementation period before dashboard creator and business analyst received a design thinking training.

Participant#1: Dashboard creator explained that he did not concern about needs or insights from user. After getting the requirement from business analyst, he just designed and worked only with development team to deploy dashboard on the timeframe.

Participant#2: Business analyst described that business user just only told what they want to see in their dashboard without concerning about data source and any constraints of software tools.

Participant#3: Business user expressed that dashboard did not fit with her requirements. It took time to adjust as needed. Therefore, she had to use Microsoft Excel instead of dashboard.

Table 1- Contributions to dashboard design without design thinking concept

Dashboard design procedure stages[10]	Dashboard Creator	Business Analyst
1.Diagnosis	Have not conducted detail diagnosis proactively	Gather requirements and feasibility from business user
2.Dashboard requirement	One-way communication of requirement from user	Translate business requirement to Dashboard Creator
3.Dashboard template definition	Development template with IT team without user participation	Support Dashboard Creator in some detail
4. Dashboard development	Individual decision making of required data	Not involved in this stage

Dashboard design procedure stages[10]	Dashboard Creator	Business Analyst
5. Implementation of the designed dashboard	Deploy production version without prior prototyping	Explain user about how to use the dashboard

Part 2: With Design Thinking Concept

The second session of interview, participants were inquired about dashboard project after dashboard creator and business analyst applied steps of design thinking in their project. Table 2 revealed the process of design thinking in dashboard design stages.

Participant#1:

Dashboard creator agreed with design thinking that it was essential to understand requirements clearly before designing dashboard. Well-defined project requirements could aid him to work with business analyst to generate more ideas and better solutions for dashboard design. To create effective dashboard, he had to consider multi-facet design aspects which were not only dashboard functionality but also its visualization features.

Participant#2:

Business analyst involved in how to get needs and insights from business user. According to the principle of design thinking that focused on three perspectives (people, problem and technology), the way to get real needs and insights started with people. Hence, he changed dashboard project stratagem. Collaborating with dashboard creator to gather requirements could help them to analyze needs and problems more clearly.

Participant#3:

Business user impresses with new design dashboard. She received all answers for her requirements. Dashboards provided an important information in a well-designed that was simply to use. Compared to Excel sheets, new dashboard was more flexible to use and able to drill down to focused points which made her data-driven decision more precise and reliable.

Table 2- Contributions to dashboard design with design thinking concept

Dashboard design procedure stages [10]V	Dashboard Creator	Business Analyst
1.Diagnosis	Support business analyst in defining persona (Empathize & Define)	Define persona and draw outline expectations before meeting with end user (Empathize & Define)
2.Dashboard re-quirement	- Noted taking - Recording - Clarify system limitations (Define)	Conduct meeting and interview workshop with business user (Empathize)
3.Dashboard template definition	- Specify functional features - Define data source and formula (Ideate)	- Define insight and problem (Define) - Specify on visual features - Define unit of analysis, data characteristics and granularity (Ideate)
4. Dashboard devel-opment	Wired frame prototyping development (Prototype)	- Prototype verification (Test) - Pre-UAT (Test) with user on design acceptance - Get feedback (Test)
5. Implementation of the designed dashboard	Improve dashboard design according to user feedback	Fine tune with business user

Part 3: Suggestion and recommendation

The last session of interview, participants were requested to contribute suggestions for dashboard design project.

Participant#1: Dashboard creator

“Compared with pre-design thinking period, we spent more time to finalize the project because of iterative processes. However, it effectively addressed the user point of interest, which reduced the change request afterwards.” (Participant#1)

Participant#2: Business analyst

“I thought it would be a good idea to have business users to understand design thinking concept beforehand. When project initiated, the understanding of iteration in prototyping and testing was very important. And it needed the cooperation from users for repetitive tasks.” (Participant#2)

Participant#3: Business users

“The process was good, but it would be better if the process could be shortened on prototyping and testing phases. Collaboration tools would be advantageous to support and facilitate project procedures.” (Participant#3)

All 5 stages of design thinking including empathize, define, ideate, prototype and test have proved to be able to enhance dashboard design procedure in real-world enterprise.

Conclusion

In summary, this study explored the role of design thinking on the dashboard design procedure stages. It sought out preliminary data and knowledge about dashboard design and design thinking concepts by dashboard creator, business analyst and business user.

The finding provided some initial insights on dashboard design. Building an effective dashboard by design thinking concept enables useful and effective dashboard for business user. However, the finding also revealed that iterative cycle of design thinking caused time-consuming in dashboard implementation project. It was necessary to provide design thinking knowledge to all stakeholders including business users who involved in dashboard project. Successful project is all about managing relationships between stakeholders' tasks, involvement and appropriate design procedure.

This paper articulates the finding from a single company which might be limited in the generalizability of the study outcome. However, arguably, the result of this study is transferable to other entities responsible for design thinking and dashboard design.

In order to make the results more generic, future research should collect the data from other companies and different types of organizations.

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The Study on Value of Self-Regulation Mechanisms in e-Commerce: From Prospects of Consumer Shopping Behaviors

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Abstract

This study aims to explore the correlation between consumer protection system and consumer's purchasing behavior in e-Commerce. Online Consumer protection system relies on both self-regulation mechanism and external regulation mechanism. Existing online self-regulation mechanisms include trust marks, privacy policies, and information disclosure. Data of this research was collected from 1,081 consumers among a street questionnaire distributed in Taipei, Taichung and Kaohsiung City (the north, middle, and south areas in Taiwan) during July to August 2018. Regression analysis and factor analysis were employed as main statistical tools, and the result showed that self-regulation mechanism is the most significant factor affecting consumers' purchasing behaviors which means the corporate self-regulation mechanisms would positive influence consumers' willingness to purchase and turn it to be actual online shopping behaviors. That is the value of self-regulation mechanism in e-Commerce from the consumers' point of view. At last, this study also analyzed consumer's cognition of self-regulation mechanism by utilizing principal components analysis, and concluded with 3 applicable steps: (1) to build an e-store with complete information integrity, (2) to work with the third-party certification organization and to meet the requirements of industry code of conduct, (3) to invest in information security appliances and hardware.

Keywords

Self-Regulation Mechanism, Consumer Protection, e-Commerce, Consumer Behavior.

Introduction

With mature and popular internet technology, e-Commerce is now popular in many modern countries, including Taiwan and Mainland China. Online shopping has become a commonplace with consumers. However, consumers consistently care about privacy and transaction issues. (Cranor & Acquisti, 2011; Pan, 2006; Shamir, 2017)

According by MIC's survey data in 2018, the rate of using internet was 82.3% in population over the age of 12 in Taiwan. The rate of online shopping was 45.0% in that same population. The rates were increase still from 2012 to 2018. For the reason of building the safety of online shopping, some industrial consulting and scholars have proposed that self-regulation mechanisms can protect consumers' shopping safety. (Lynch, Kent & Srinivasan, 2001; Kimery & McCord, 2002; Rifon, LaRose & Choi, 2005; Weber, 2010; Shamir, 2017; Livingstone, Tambini, Belakova & Goodman, 2018)

In particular, the trust-mark system is the care of self-regulation mechanism. The trust-mark will increase the sense of security for consumers. In the same way, trust-mark will increase the consumption probability and staying time of consumers on the website. (Rifon et.al, 2005; Joinson & Paine, 2007) Therefore, this study finished the consumer survey about self-regulation mechanism, namely trust-marks and privacy policies. The discussion was the significant positive correlation between self-regulation mechanism and behavior of consumers. This paper argues that value is comes from the self-regulation mechanisms in e-Commerce.

Purpose

Base on the research introduce, this survey collected responses from consumers that have experienced shopping online in Taiwan. The purpose of survey is measuring the importance of self-regulation and honest notice within trading procedure. Finally, the study builds the regression

path model that is consumer shopping. For the purpose of this study, the following three important objectives are listed below:

1. Survey the degree of demand and consuming behavior about online shopping.
2. Understand the consumer's cognition of the self-regulation mechanism of online shopping.
3. Build the self-regulation mechanism model of consumer behavior for e-commerce.

The study verifies that e-commerce companies focus on build self-regulation and honest system that benefit for consumer shopping behavior. The self-regulation and honest system will be the importance industry guidelines. This study will be the nice reference for self-regulation mechanisms and business relationships simultaneously.

Literature Review

1. Self-Regulation

The term self-regulation is symmetry reflection of legal and regulation. The content of self-regulation is not derived from a legislative process, which has provided by industrial guidelines and company specification of service. (Martin, 1997; Margot, 1998) Within the current legal and regulation system, it is possible that supervise crimes and illegal activities. The operation of law system also represents the cost of society. The self-regulation mechanisms will supplement insufficiencies in the legal system. Therefore, it may reduce the cost of government legal system and police monitoring. It can also prevent the behavior of free-rider between consumers and provider. (Bomsel, Börkey, Glachant & Lévêque, 1996; Michael, 1996; Margot, 1998)

There are several common and similar practices in the actual practice of the self-regulation mechanisms. A literature review found three claims or practices, including seals of approval, guaranteeing, and rating system. (Lynch, Kent & Srinivasan, 2001) Kimery & McCord (2002) argued that adding the privacy policy or honesty notices on the official website in addition to trust-mark, process mark, and technical mark are common forms of self-regulation, with the "mark" is being discussed in several other literature reviews. For example, the trust-mark would increase the consumer sense of trust and website privacy protection. (Rifon, LaRose & Choi, 2005) The self-regulatory mechanisms have highlighted the handling of trading disputes, especially

for the difficult cross-border transactions. Shamir (2017) argued that the self-regulation mechanism of e-commerce could resolve the disputes of foreigners' infringements, eq. establishment of ODR (online dispute resolution) system for friendly international transactions. This also highlighted the corporate responsibility in e-commerce.

2. Application of Self-regulation

Wood & Bandura (1989) argued that self-regulation mechanisms are mediated between the browsing website and consumer decision-making. They believe that self-regulation is the complex influence about performance improvement, self-regulation content, and decision analysis cycle within the companies. Milne (2000) argued that the most importance factor is information exchange in e-commerce, which an element of consumer trust is the self-regulation of company. Caudill & Murphy (2000) argued that there are two comparison points about ethics topics of e-commerce, including reference of international regulation, and self-regulation mechanism of company itself. Culnan (2000) argues that self-regulation and regulation would protect the personal data in e-commerce, which former is efficient and comprehensive. However, regulation system is deterrent, mandatory, and penalty for industries and consumers. Miyazaki & Fernandez (2001) argued that company of e-commerce identified consumers through technology, which must be highly self-regulation management for protection personal data. It is impossible to fully rely on the laws of different countries.

Through the voluntary seal or mark, the consumers would increase trust sense and consumption, eq. BBBOnline and TRUSTe mark system in US. The self-regulation mechanism is the moderator effect of consumer behavior. (Rifon, LaRose & Choi, 2005) There are more and more new internet technologies that have led consumers to expose their personal data and private content. Therefore, companies need to provide the mechanism of trust for consumers. The sufficient data protection of companies would be converted to the more consumers and low management costs. (Joinson & Paine, 2007) Weber (2010) argued when the new technology was developed, there must be the self-regulation mechanisms in place in order to legal and regulation contents.

3. Social Network and Self-regulation

In the recent researches, it has shown the relationship between online shopping behaviors and consumers' cognition. The studies shown that positive correlation

between the frequency of shopping and the attach importance to privacy. That study means better and better protection of privacy policy that will become the frequency and amount of consumption. (Tsai, Egelman, Cranor & Acquisti, 2011; Fuchs, 2012) In the 21st century, the social networks are very popular in the world. There are some psychological mechanisms in the social networks, including trusting, gaining trust, and self-regulation. Extending the trust of online shopping, the trust relationship of social networks was built on each user, for example the mutual evaluation systems. When mutual evaluation systems are insufficient, then self-regulation mechanism is very important in the social networks. (Finkenauer & Righetti, 2016)

The social networks are prone to bad information, pornography, violence, and hate speech. This is especially concerning as there are many children that have easy access to the smart devices and access to such information. Normal legal actions and regulations could be made to forbid access to children, but the self-regulation system of the industries could also provide more trust for consumers. The industrial responsibility is better important than the user's. (Livingstone, Tambini, Belakova & Goodman, 2018) Not only has it required users, but also the operators of social networker need self-regulation inspectors to self-regulate. There are several social network platforms in Europe that set users' self-regulation requirements and automated content inspection mechanisms for racial hate speech (Quintel & Ullrich, 2019)

Survey and Data Collection

This study designed the structured questionnaires for people with online shopping experience. The topic discussion is the relationship between consumers' cognition, self-regulation mechanisms, and online shopping behaviors. The study confirms that self-regulation mechanisms will improve online shopping behaviors.

The data resources of this study are from the consumer questionnaire. The questionnaires were filled in by subjects at publicity meetings, seminars, and randomly on the street during the two months from July to August 2018. Based on the estimated number of samples size, this study should collect over 1,073 cases to reach a 95% confidence level. Finally, the study collected 1,205 questionnaires. After deducting the incomplete of the questionnaire, the actual number of valid questionnaires was 1,081. The effective ratio was 89.71%.

Framework

The framework of this study is bases on consumer cognition, transaction satisfaction, and transaction demand and consumer shopping, which are the independent variables. The online shopping behaviors of consumers are the dependent variables. The self-regulation and regulation mechanisms are the moderator variables. By the variables, there were five hypotheses that were verified in this study. The framework of this research is shown in Figure 1:

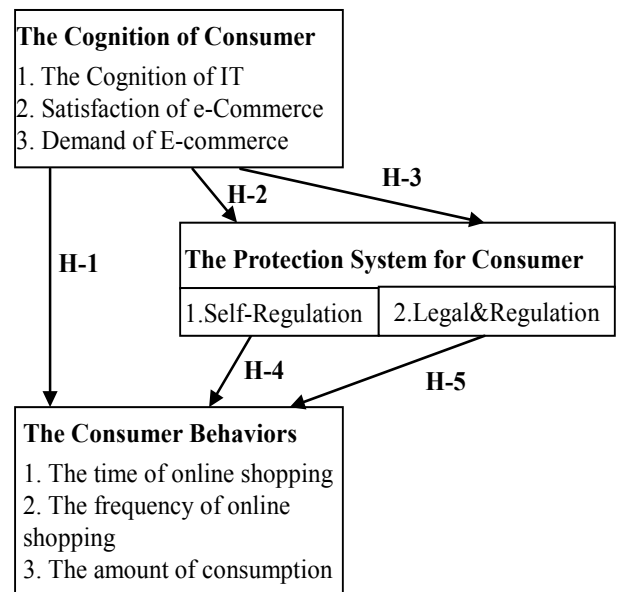


Fig.1 The framework of the Study

Hypotheses

Recent research has shown that online shopping behaviors are related to consumer cognition. It mean that positive correlation between the frequency of online shopping and the attach importance to cognition, including satisfaction and demand. (Tsai et.al, 2011; Fuchs, 2012) Therefore, hypothesis 1 is:

Hypothesis 1: The consumers' e-commerce cognition has a positive correlation with the consumer behaviors.

In previous research, there was the positive correlation between the consumer's cognition of security, shopping satisfaction, and the demand for shopping. This study increases to test the relationship between consumer cognitive and protection mechanisms, including self-regulation mechanisms and legal mechanisms. This is a discussion that rarely appeared in previous literature discussions. The research hypothesis 2 and 3 are:

Hypothesis 2: The consumers' e-commerce cognition has a positive correlation with the self-regulation mechanisms.

Hypothesis 3: The consumers' e-commerce cognition has a positive correlation with the regulation mechanisms.

The core issue of this study is whether the self-regulation mechanism is a factor in enhancing consumer behaviors. For example, the consumers were strong safety confidence themselves by the trust-mark system (Rifon, LaRose & Choi, 2005; Pan, 2006). The base of consumers' confidence is not about high-technology invested by manufacturers but rather trust protection and honest mechanism. (Joinson & Paine, 2007; Weber, 2010) The most important hypothesis is that the consumers are more attention to the protection of self-regulation and regulation, which can convert it into actual shopping behavior of e-commerce. Therefore, the research hypothesis 4 and 5 are:

Hypothesis 4: The consumers' self-regulation cognition of e-commerce has a positive correlation with the shopping behavior of themselves.

Hypothesis 5: The consumers' legal and regulation cognition of e-commerce has a positive correlation with the shopping behavior of themselves.

The questionnaire of this study was very short, with only 25 questions. The questions were designed by the Likert 7-point scale. Yin (2003) argued that the 5 point Likert scale is too simple and the sensitivity of the respondents to perceived differences is lower. Therefore, this study used a 7-points scale. The dependent variables of this study are consumers' behaviors with online shopping, including the average time on the internet per day, the average times of online shopping per month, and the average amount of online shopping per time. Three dependent variables were in the open options of the questionnaire. With the average times per month and the average amount per instance, the study was able to make a rough estimate of the annual online shopping expenditure.

Statistical Analysis

1. Reliability Analysis of the Questionnaire

The reliability of questionnaire was analyzed using Cronbach's α value, which measures the consistency of each variable. The Cronbach's α value of this study was set to 0.7 according to the relevant research, and the reliability of questionnaire is declared to be accepted.

The reliability analysis of this study, the detected values are above 0.7. It shows that the reliability of the relevant variables could be accepted. The result of reliability analysis is shown in Table 1.

Table 1 Reliability Analysis of the Questionnaire

Dimension	Sub-dimension	Items	Cronbach's α	Mean
Cognition of Consumer	1. Cognition of IT	6	0.859	4.652
	2. Satisfaction of e-Commerce	5	0.933	4.850
	3. Demand of e-Commerce	5	0.839	4.319
Protection System	1. Self-regulation mechanisms	7	0.854	5.377
	1. Legal and self-regulation	2	0.737	4.731

2. Descriptive statistics

This study collected 1,081 valid questionnaires in July to August 2018. There were two dimensions, including the cognition of consumer and protection system. After the collection of this study data, the basic descriptive statistics were summarized in Table 2 to Table 6.

Table 2 Descriptive Statistic of Shopping Behavior

Variable	N	%	Variable	Mean	S.D.
A. Gender			B. time of using internet /per. day	5.39	3.85
Male	530	49.0%	C. frequency of online shopping / per. month	1.82	1.69
Female	551	51.0%	D. amount of consumption / pre. time	2,409	1,560

n=1,081, unit: B = hours, D = NTD (New Taiwan Dollars)

From Table 2, the descriptive statistic of this survey was overview of the online shopping behaviors in Taiwan. The amount of each person's online shopping spending is about 2,409 NTD per month, which is about 1.82 times per month. The data of this study estimated that each consumer spends about 52,000 NTD per year in the online shopping. This mean has shown the reason why traditional manufacturers need to transform e-commerce in recent years. The e-Commerce market was a certain proportion of the amount of consumption.

The part one of consumer cognition is the cognition of IT, including six questions about information technology. The data was organized as shown in Table 3:

Table 3 Description of Cognition of IT Statistics

Question	Mean	S.D.
1. Generally, Familiar and Understand the Information / Internet.	4.57	1.309
2. Write Program / Set the Website	3.51	1.839
3. Apply Cyberspace and Cyber disk	3.86	1.635
4. Use E-mail / Apply the E-mail Address	6.06	1.122
5. Set the Internet / Wireless / AP Hub	5.02	1.485
6. Generally, Familiar the Computer, Tablet or Smart-device	4.90	1.345

n=1,081, Likert 7 points scale

From Table 3, the descriptive statistic of IT cognition was overview of the basic knowledge distribution of consumers in Taiwan. The minimum score was 3.51 points "Write Program / Set the Website", and highest score was 6.06 points "Use E-mail / Apply the E-mail Address". Overall, the average score of objects was 4.90 about using 3C device in Taiwan.

The part two of consumer cognition is the satisficing for e-Commerce. The data was organized as shown in Table 4:

Table 4 Descriptive Statistic of Satisfaction of EC

Question	Mean	S.D.
1. The Satisfaction of "Products" in the Online Shopping	4.79	1.073
2. The Satisfaction of "Efficiency" in the Online Shopping	5.07	1.045
3. The Satisfaction of "Price" in the Online Shopping	4.88	1.088
4. The Satisfaction of "Customer Service" in the Online Shopping	4.69	1.031
5. Generally, the Satisfaction of Online Shopping	4.82	1.002

n=1,081, Likert 7 points scale

From Table 4, the descriptive statistic of satisfaction of e-Commerce was the overview of motivation of consumers in Taiwan. The first and second score of Likert scale were the satisfaction of "Efficiency" and "Price". It means that the important factor of online shopping is efficiency and price. The part three of consumer cognition is the demand of e-Commerce. The data was organized as shown in Table 5:

Table 5 Descriptive Statistics of Demands for EC

Question	Mean	S.D.
1. For Limited Product, Online Shopping Only	4.11	1.287
2. After Price Comparison, Online Shopping Only	5.12	1.195
3. Limited Spare Time, Online Shopping Only	4.12	1.347
4. For other Reasons, Online Shopping Only	3.70	1.316
5. Generally, Online Shopping is Necessary for Me	4.55	1.372

n=1,081, Likert 7 points scale

The descriptive statistics of demand for e-Commerce show an overview of the necessities for consumers in Taiwan. The relationship of Table 4 and Table 5 was the highest score is the necessity of the price comparison. In the Table 4, it has shown that second factor in consumer satisfaction is price. The factor of price necessary is 5.12 points.

Table 6 was the consumer cognition of protection system in the process of online shopping. The most important purpose of this study hypothesis is to explore whether consumer cognition of protection systems could achieve significant factors in consumers' behaviors. Therefore, through the nine questions in the part of the questionnaire as a variable, these are different measures for protection system. The data was organized as shown in Table 6:

Table 6 Descriptive Statistics of consumer cognition of protection system

Question (When I'm shopping in the online Store...)	Mean	S.D.
Q 1. I Care the Protection of Personal Data of Online Store.	5.67	1.098
Q 2. I Think the Online Store Compliance with Legal and Regulations.	6.09	1.017
Q 3. I Choose the Trustworthy Online Store.	5.30	1.304
Q 4. I Choose the Online Store that Set the Trust-mark.	5.45	1.299
Q 5. I Understand the Anti-Virus and Anti-Hacker of Online Store.	4.59	1.517
Q 6. I Understand the Privacy policy of Online Store.	4.96	1.431
Q 7. I Read the Notice of Payment System of Online Store.	5.59	1.163
Q 8. I Read the Service Information of Online Store.	5.29	1.355
Q 9. I Think the Online Shopping is Safe by Consumer Protection Act.	4.17	1.456

n=1,081, Likert 7 points scale

In the cognition of protection system, there was an interesting phenomenon which highest and lowest score was regulation system both. The highest score is 6.09 points, consumers believe the online store compliance with legal and regulations. The lowest score was 4.17 points, showing that consumers don't think of the "Consumer Protection Act" as useful.

3. Factor Analysis

The mediator variable of this study framework is the cognition of protection systems, as asked in the nine questions in the questionnaire. There were two types of protection system, including self-regulation mechanism and regulation mechanism. The factor analysis was used as the reclassification between variables among these nine questions of questionnaire. In order to achieve the common factors of extraction data, the factor rotation was performed by the varimax method. The factor analysis was organized as Table 7:

Table 7 Factor Analysis the of Consumer Cognition of Protection System

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.595	51.050	51.050	4.595	51.050	51.050	2.990	33.221	33.221
2	1.299	14.429	65.479	1.299	14.429	65.479	2.903	32.258	65.479
3	.747	8.297	73.776						
4	.627	6.967	80.743						
5	.526	5.850	86.593						
6	.373	4.150	90.742						
7-9	...	...	...						

From the Table 7, the consumers' cognition of protection system could factor analysis to reach 65.479% in the interpretation of the main factors. It means the degree of attribution of this material is significantly accepted. At the same time, it could significantly distinguish the interpretative meaning between questions. The nine questions used in this study can be component to list in Table 8:

Table 8 Rotation Method for Consumer Cognition of Protection System

Question of Protection System	Component	
	Self-Regulation	Regulation
Q1	0.734	0.384
Q3	0.716	-0.171
Q4	0.773	-0.017
Q5	0.728	-0.448
Q6	0.768	-0.015
Q7	0.818	0.166
Q8	0.801	0.061
Q2	0.479	0.710
Q9	-0.535	0.620
Initial Eigenvalues	4.595	1.299
% of Variance	51.050	14.429
Cumulative %	51.050	65.479

Extraction Method: Maximum Likelihood. Rotation Method: VariMax with Kaiser Normalization.

From the Table 8, it's more able to directly express the protection cognitive of consumers in online shopping which was divided into two blocks. The first block was the self-regulation mechanism, including the protection of personal data, trustworthy, setting the Trust-mark, anti-virus / hacker, privacy policy, notice of payment system, and service information. The second block was the regulation mechanism, including the compliance with legal and regulations, and Consumer Protection Act. After the rotation method, it's made two main factor components and the factor standardize scores. These scores would be used as the variables for regression analysis of this study.

Hypotheses Testing

The results of this study confirmed the first hypothesis, which described the relationship between consumers' cognition and shopping behavior. In regards to the consumers' behaviors, the amount of time spent online shopping, frequency and amount of consumption, the model explained is the most complete when the dependent variable was the amount of consumption. Therefore, this study used the amount of consumption was the dependent variable in the hypothesis 1, 4 and 5 only.

Table 9 Multi-Regression Analysis of Cognition and Behavior

Dependent Independent	Behavior (The amount of consumption)		
	B	Std. Error	Beta
Constant	4.610	0.025	
The Cognition of IT	0.048	0.026	0.057
The Satisfaction of EC	0.210	0.026	0.250***
The Demand of EC	0.004	0.026	0.004
Adj. R ²	0.171		
F test for Regression	82.632***		

$\alpha=0.05$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

From the multi-regression analysis of Table 9, the consumers' cognition was partially related with the consumers' behavior. The adjusted coefficient of determination (adj. R²) is 0.171, which is significant. However, on the independent variables, only the satisfaction of e-Commerce is significant in the multi-regression model. This means that higher satisfaction also meant a higher amount of consumption. The conclusion of hypothesis 1 is positive correlation and one observed variable was significant.

Hypothesis 1: The consumers' e-commerce cognition has a positive correlation with the consumer behaviors. (Verified, Positive Correlation)

The second and third hypothesis of this study confirmed the relationship between consumers' cognition and protection system. The protection system could be divided into the self-regulation and regulation mechanism. Table 10 shows the multi-regression analysis for hypothesis 2:

Table 10 Multi-Regression Analysis of Cognition and Self-regulation

Dependent Independent	Self-regulation (Std. Score)		
	B	Std. Error	Beta
Constant	2.016	0.119	
The Cognition of IT	0.214	0.021	0.273***
Satisfaction of EC	0.293	0.030	0.309***
The Demand of EC	0.162	0.026	0.188***
Adj. R ²	0.397		
F test for Regression	237.905***		

$\alpha=0.05$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

From the Table 10, it can be seen that the consumers' cognition was partially related with the self-regulation protection system. The adj. R² is 0.397, which is significant. Moreover, the three independent variables

were significant in the multi-regression model. This means that higher cognition was higher careful self-regulation mechanism of e-Commerce stores. The conclusion of hypothesis 2 is positive correlation and all observe variable are significant.

Hypothesis 2: The consumers' e-commerce cognition has a positive correlation with the self-regulation mechanisms. (Verified, Positive Correlation)

Table 11 was the continuation of Table 10, which tests the hypothesis 3 in the same manner:

Table 11 Multi-Regression Analysis of Cognition and Regulation

Dependent Independent	Regulation (Std. Score)		
	B	Std. Error	Beta
Constant	2.110	0.082	
The Cognition of IT	-0.149	0.015	-0.336***
Satisfaction of e-Commerce	-0.054	0.020	-0.100**
The Demand of E-commerce	-0.082	0.018	-0.167***
Adj. R ²	0.113		
F test for Regression	46.861***		

$\alpha=0.05$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

From Table 11, the consumers' cognition was related with the regulation protection system of e-Commerce stores. The adj. R² is 0.113, which is significant. The three independent variables are significant in the multi-regression model. It's mean that logic explanation is the same as Table 10, but Adj R² of Table 11 was smaller than the Table 10. Compared with regulation mechanism, the self-regulation of protection system could be more interpreted as the relationship between the consumers' cognition.

Hypothesis 3: The consumers' e-commerce cognition has a positive correlation with the regulation mechanisms. (Verified, Positive Correlation)

The fourth and fifth hypothesis of this study confirmed the relationship between protection system and consumers' behaviors that is core issue in the framework. The core of two hypotheses was to confirm that consumers' behavior was affected by protection mechanism of e-Commerce stores. The Table 12 is the regression analysis for hypothesis 4:

Table 12 Regression Analysis of Self-Regulation and Behavior

Dependent	Behavior (The amount of consumption)		
	B	Std. Error	Beta
Constant	-3.151	1.000	
Self-regulation	0.614	0.019	0.707***
Adj. R ²	0.499		
F test for Regression	1076.236***		

$\alpha=0.05$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

From the Table 12, the consumers' cognition of self-regulation protection system in online store was related with the consumers' behaviors. The adj. R² is 0.499, which is significant in the regression model.

Hypothesis 4: The consumers' self-regulation cognition of e-commerce has a positive correlation with the shopping behavior of themselves. (Verified, Positive Correlation)

Table 13 Regression Analysis of Regulation and Behavior

Dependent	Behavior (The amount of consumption)		
	B	Std. Error	Beta
Constant	-2.408	0.137	
Regulation	0.485	0.026	0.489***
Adj. R ²	0.239		
F test for Regression	339.473***		

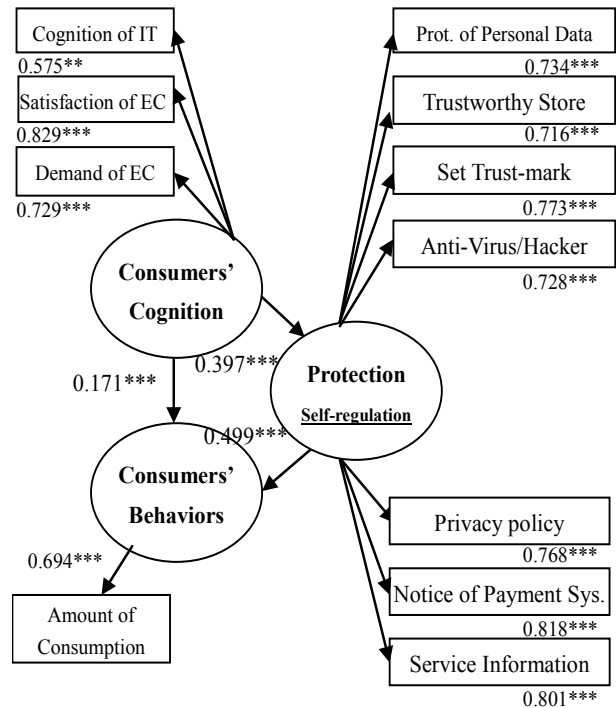
$\alpha=0.05$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

From the table 13, the consumers' cognition of regulation protection system in online store was related with the consumers' behaviors. The adj. R² is 0.239, which is significant in the regression model. However, compared with influence of protection system, the self-regulation mechanism could be more influent for the consumers' behaviors.

Hypothesis 5: The consumers' legal and regulation cognition of e-Commerce has a positive correlation with the shopping behavior of themselves. (Verified, Positive Correlation)

Path Analysis

In the study framework, it has obtained the combination of three dimensions, including the online shopping of consumers' cognition, the protection system of consumers' cognition and the online shopping behaviors. The correlation coefficients of hypothesis 1, 2, 4 are 0.171, 0.397 and 0.499, respectively. In the comprehensive analysis, this study used the path analysis method of Structural Equation Modeling (SEM). The path analysis result of three main dimensions was shown in Figure 2.



$\alpha=0.05$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Fig. 2 Path Analysis of the Study Framework

Table 14 the Effect of Composition of this Study on Consumers' Behavior

Principal Component	Direct Effect	Indirect Effect	Total Effect
Mediator: Self-regulation	0.171	0.198	0.369
Only Consumers' Cognition	0.171	--	0.171
Only Self-regulation	0.499	--	0.499

* Indirect Effect = 0.397 * 0.499

By the results of path analysis in the study, the Table 14 listed all the structural path effects, including the direct, indirect, and total effects within the components.

The Table 14 has shown that has the significant impact from the consumers' cognition to shopping behavior, the coefficient of determination is 17.1% only. However, the path from the self-regulation mechanism, it could be can increase the indirect effect, which is 19.8%. From the results of path analysis, when consumers understand the self-regulation mechanisms of e-Commerce, they will increase the behaviors of online shopping automatically. Therefore, the e-Commerce stores operate the self-regulation mechanisms has provided the evident business performance, for example the privacy protection, trust-mark etc. The path analysis of the study shows the value of self-regulation mechanisms in e-commerce successfully.

Discussion

The purposes of study were to understand the importance of self-regulation mechanisms, the impact model on consumers especially. Based on the established the statistical model for the consumer-side, the consumers' cognition of e-Commerce will influence their shopping behavior. However, the consumers' cognition of self-regulation is the effective mediator variable for consumers' behaviors, in the amount of consumption especially. It means the e-Commerce companies operated the self-regulation mechanism that is valuable.

Within the limited time and research resources, this study designed the short and simple questionnaire for built the most reasonable regression model exceedingly. This study expected the consumer-side survey would be referential paper for the e-Commerce industry. It points out the importance of self-regulation mechanism of companies. The discussion and application of the purposes in this study are described below.

1. The Impact of Self-regulation Mechanisms

In the consumers' cognition of all components, the self-regulation cognition and consumers' behaviors are the strongest coefficient of determination in the hypothesis 4. It means that when consumers recognize the self-regulation protection system of e-Commerce, there are 49.9% opportunities will drive shopping behavior. In the literature review, the self-regulation mechanisms were discussed the mechanisms and importance. (Lynch et.al, 2001; Kimery & McCord, 2002; Rifon et.al, 2005; Finkenauer & Righetti, 2016; Shamir, 2017) The literature discussed the relationship with the self-regulation mechanisms and shopping frequency, which close to this study relatively. (Tsai et.al, 2011; Fuchs, 2012) This study

filled the gap in literature covering the impact of self-regulation mechanisms on consumers' behavior.

2. The Self-regulation Mechanism Greater Than Consumers' Cognition

In the study framework, there are three components that tested with consumers' behaviors, including consumers' cognition of e-commerce, cognition of self-regulation mechanism, and cognition of regulation mechanism. The self-regulation mechanism is the strongest significant determination with the consumers' behaviors. It means that the importance of self-regulation mechanisms deserves to be established in the industries and companies. Of course, the government laws and regulations are important, but the industrial guidelines of self-regulation mechanisms are more important and effective. For example, the government formulated the food safety acts, but it's not as effective as the self-regulation integrity of the food manufacturers. In the transaction process of e-commerce, consumers are affected by self-regulation factors.

3. Re-organized the Self-regulation Mechanism

There are many kind forms of self-regulation mechanism in e-Commerce industry and other industry. From Table 8 and Figure 2 of this study, the influence of variables could be arranged, and organized them into Table 15.

Table 15 Re-organized and Classified the Self-regulation Mechanism

Variable	Beta	Classified / Industrial Operation
7. Notice of Payment System	0.818***	First: To Create an e-Commerce mall with complete and perfect information
8. Service Information	0.801***	
4. Set the Trust-mark.	0.773***	Second: To compliance with industry guideline and to participate in the third-party certification organization
6. Privacy policy	0.768***	
1. Protection of Personal Data	0.734***	
5. Anti-Virus and Anti-Hacker	0.728***	Third: To invest the information security and hardware equipment
3. Trustworthy Online Store	0.716***	

$\alpha=0.05$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

From the classification of Table 15, this study analyzed the questionnaire by consumer-side, that would provide the strategy for e-Commerce industry. The strategy was three steps for your e-Commerce business. The first step is to create an e-Commerce mall with complete and perfect

information for consumers' watching. The second step is to compliance with industry guidelines and to participate in the third-party certification organization for your trustworthy. The third step is to invest the information security and hardware equipment for your sustainable development.

Suggestion

After the data analysis and hypothesis testing, there may be the missing dimensions or other extended topics in this research that can be explored. It is suggested that the following study focus on the two points:

1. To Change the unit of dependent variable

This study data was based on the questionnaire surveys, of the dependent variables were the consumers' behaviors. However, the consumers' behaviors would be many different variables on the online shopping. It suggests that change the unit of dependent variable, for example the recommend willingness, tolerate complaints, or publicity complaints. These variables have been less discussed of consumers' behaviors of e-commerce in previous studies.

2. To Change the Research Methods

The core purpose of this study was self-regulation mechanisms for consumers' behaviors in e-Commerce. It suggested that change the research methods, namely the interviews of focus groups, professional opinion, qualitative research, corporation case study etc. It's used as the goal of comparative research and comparison to discuss why the consumer behavior affects by self-regulation mechanisms.

Limitation

1. Sampling Bias

This study collected 1,081 observations from three big cities in Taiwan. The observations were collected in the Secure Online Shopping Association (SOSA) activities in July and August 2018. Essentially, the sample population comes from the metropolitan area population. For the estimation of consumers in Taiwan or global e-commerce, it's easy to make the sampling bias, although it is plaguing the problem of researching reliability and validity. However, the sampling bias has to must accept in data selection in this study also.

2. Limited Dimension

This study discussed the consumers' behaviors and the

self-regulation mechanisms as the protection system. However, there are many relational dimensions about consumers' behaviors and protection system that affect online shopping. This study considered the factors of simplified questionnaire, time and funding, selected three dimensions in the study framework only.

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Analyzing Online Fake Business News Communication and the Influence on Stock Price: A Real Case in Taiwan

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Abstract

On the Internet age, news are generated and distributed not only by traditional news media, but also by the a variety of online news media, news platforms, content websites/content farms, and social media. Since it is an easy task to create and distributed news, some of these news reports may contain fake or false facts. In the end, the cyberspace is full of fake or false messages. People may wonder if these fake news actually influence our decision making. In this paper, we discussed a real case of fake news. In this case, a Taiwanese company used some fake news, advertorial news, and news placement to manipulate or influence its stock price and trade volume. We collected all news for the case company during a period of four year and five month (from January 2013 to May 2017). We analyzed the relationship between published news and stock price. Based on the analysis results, we conclude that we should not ignore the influence of news placement and fake business news on the stock price.

Keywords

Fake News, News Placement, Stock Trading, Business News, Case Study, Taiwan.

Introduction

Fake news refers to news reports or news stories that based on misinformation, disinformation, and fake (or false) facts. After the 2016 presidential election of the United States, people around the world are aware of the power and impact of fake news. Due to the popularity of internet and mobile technology, people now receive news and messages not only from traditional news media, but also from the online news media, content websites/content farms, and social media. The rapid distribution of news and messages has change the industry practice of news industry. Most news media no longer hold a rigorous editorial screening mechanism for the accuracy of news report. By contrast, some news media request their news reporters to provide increasing number of news reports as quick as they can to attract attention from audience. Some of these news reports contain fake or false facts. These incorrect news articles are distributed in the cyberspace. In the end, the cyberspace is full of fake or false messages.

The raising of fake news should be attributed to the blooming of social media. Spammers and fake news spreaders use social media to distribute fake news. It is easy to register multiple accounts using fake demographic information in some social media. Thus, some of these social media are full of fake account. Fake news are distributed to the public by the fake social media account.

For example, Facebook admitted there were a lot of Russian fake accounts that had bought more than 3000 advertisements on their platform in the period of 2016 US presidential election [1]. Mark Elliot Zuckerberg, the founder of Facebook, promised that Facebook will fight against fake news through checking the source of each post [2-4].

People are aware of the fake political news since the election results are influenced by the fake news. Nevertheless, fake political news is not the only kind of fake news that appear in the cyberspace. Business fake news is another type of fake news that exists in

cyberspace, that might be used to manipulate the stock price and market order.

In almost all countries, it is illegal when manipulating the stock price for individuals' own benefit. Nevertheless, for self-interest, it is occasionally found that these are some stock price manipulation cases. Stock market administrator may monitor daily transactions and warn investors for the unusual transaction. However, the warning is made to the public only in a serious condition.

Fake news is widely disseminated in cyberspace, that influence our daily decision making. Nevertheless, many previous literature focused only on the political fake news. Few research focus on the influence of business fake news on stock transaction in securities market. In this paper, we focus on the relationship between business fake news and manipulation of security price. We used a real case study in Taiwan to investigate the generation, distribution, and impact of fake news. We used the case study to explore the following three research questions:

- (1) Would companies indeed release positive advertorial news and/or fake news?
- (2) How these advertorial news and/or fake news were generated and distributed?
- (3) What is the impact on security transaction of the publication of advertorial news and/or fake news in the case study.

Literature Review

The Definition of Fake News

Allcott & Gentzkow[5] argued in the articles of fake news that there was false information which was deliberately set. However, there is a plenty of types of fake news and no well accepted definition for fake news is available. Literatures revealed that fake news is composed of several categories reports, including satirical news, imitation news, misleading news, and propaganda[6]. Wardle [7] classifies fake news to seven types: Satire or parody, false connection, misleading content, false context, imposter content, manipulated content and fabricated Content. Satire or parody misleads readers and disseminates the false news. False connection is the situation that there is a contradiction among articles, pictures' introduction, and/or content. Misleading content is the news that contains a lot of false message, which is wrapped in a plausible logic. There is no false in the content of false context, but the article and the pictures of the news describe different

news. Imposter content is the situation that the website pretends to be a famous and credible news website. Manipulated content is the condition that the picture in the news is edited before publishing. Fabricated content contains the most of false messages, it even reports a nonexistent news sometimes. Stockmann [8] promotes the classification of Wardle [7], and advocated that it was appropriate to define fake news. Stockmann [8] also revealed that the seven categories of fake news can be summary into two types. The first three categories are unintentional behavior, and the last four categories are deliberate.

Nevertheless, the scope of fake news is quiet board in the definitions by Wardle [7] and Edson, Zheng & Ling [6]. For example, satirical news contain false information. Nevertheless, satirical news are created to entertainment audience. Satirical news is not a news report but a part of variety entertainment.

In stock market, fake news used to disseminate rumors and misinformation to influence the price of listed securities. Most stock markets prohibit this kind of manipulation behavior. However, this kind of stock price manipulation is still happen occasionally. Satirical news is not relative with the stock price manipulation behavior. The fake news definition that contains satirical news is not applicable for the current study.

Propaganda news

Fake news is a concept to discuss the misinformation distribution in cyberspace. Nevertheless, it is not easy to make sure if a news is fake or not. We need strong evidence when we try to accuse a news as fake. In business news, outside observers do not have enough information to verify the truth of news. Financial reports and public information are only resources that can be used to check the truth of the news reports in business news. Also, business news usually attract few attention from audience. Thus, few follow-up news report are made after a news report is published. Since no follow-up news report, outside observers cannot make sure if a news is fake.

Edson et al. [6] considered the news which combines a propaganda with the article was a kind of fake news. Propaganda news, news placement, paid news, or advertorial news are related with stock price manipulation since investors may be influence by these positive news. These positive news may contain false information in

some situation. To influence the stock market, companies may paid to news media for publishing positive news. Thus, news placement, paid news, or advertorial news should be included in the definition of fake news when discussing the influence of fake news on stock price manipulation.

Dissemination of Fake News on Social Media

In social media, users can easily share the news to others, that foster the dissemination of fake news. Previous research advocated that fake news communication is relative with the usage of social media [5]. People usually trust the messages distributed by the source that they have social connection with. In social media, people have social relationship with others. Thus, previous research advocated that person who read news on social media had a lower awareness of fake news [9]. Social networks is critical to distribution of fake news.

The Effect of News to Investors

There are plenty of listed stock in the securities market. Since there is too many choices of stocks, individual investors have to spread too much search cost to make their investment decision. Previous research revealed that individual investors may choose the impressive one to invest. The more news reports, the more opportunities the stock being bought [10]. Thus, news report may be relative with stock transaction.

Method

In the study, we use qualitative method to find out the relationship between the fake news and stock price manipulation. We tried to explain the communication and distribution of fake news (including propagandas and paid news).

Case Selection

The study selected a Taiwanese company (Company P) as a case, which is a famous financial scandal. It is a crime broke out at the middle of 2017. The founder of the company P manipulated the stock price and stock transaction of the company P. We used the code P instead of the real company name since that the major purpose of this study is not to accuse the company P for fake news generation and distribution.

News Collection

The study collected all news about the company P on the Internet and from a news database Taiwan News Smart

Web (<http://www.tbmc.com.tw/en-us/product/30>), which is a paid database. The study recorded all the news articles, publish date, reporters, and newspaper names. There were four major newspaper groups in Taiwan: China Times (including Commercial Times), Liberty Times, Apple Daily, and United Daily News (including Economic Daily News). The major purpose of this paper is not to accuse any newspaper publishers is fake news generator. Thus, we used code A, B, C, and D to present these four news media. The order of code is not the order of newspaper group mentioned above.

Besides, we used news' titles and content to search on Google search engine, to record the websites that reprint the news reports. This is useful to explore the influence of the news reports.

Financial Statement Collection

Besides, we also collected the finance statement information from the Market Observation System(MOPS) of Taiwan Stock Exchange Market to compare the description on the news report with the real performance of Company P.

Visit times of News Report

To discuss the news distribution and spreading, we estimating the visit times of each news and summary the websites which shared news reports about Company P.

Not all newspaper websites provide detailed visit time or traffic data for the news report. We adopted three approaches to estimate the amount of visits to the news reports on the publishers' web pages. In the first approach, we adopted the self-reported visit number of each news articles that was provided by some newspaper's websites. This approach is easy since the only thing we need to do is to record the data. However, it is valid only when the websites provide self-reported visit times of each news article. Not all newspaper websites provide this kind of traffic data.

The second approach is for the newspaper websites which provide the total visit times of all news articles written by each reporter, but do not provide the number of visit times of each news article. We collected the visit number and divided it by the amount of the reporters' articles. The average visit number of each article of the reporter will be used as estimated number of visits.

Some newspaper do not provide any details about the visit number. Thus, in the third approach, we estimated the

visit times of the whole newspapers websites by Similar Web Rank (<https://www.similarweb.com/>), which is a website traffic detection tool estimating the visits of last six months. We use Similar Web Rank to collect the visit times of all newspaper websites. Since some newspaper website provide the actual visit times of each news articles, we compare the visit times of the newspaper websites calculated by Similar Web Rank and used it to estimate the approximate visit times that do not provide self-report visit times.

Table 1 – Approach to Estimate News View Times

Approach	Description
1. Self-report actual visit times	Total amount of visits was recorded on websites
2. Use the total visit times to estimating the visit times of each news report	Dividing total amount of visits by total amount of reporters' articles
3. Using third party website traffic report to estimate the visit times	Using Similar Web Rank to estimate visits of website through recent six month

Research Results

News Publish Date and Frequency Analysis

We collected all news reported during the period from January 1, 2014 to May 17, 2017. There were 143 news published in the research period. We separated all the collected news of company P into three periods: Before the stock price manipulation, during the stock price manipulation, and after the stock price manipulation. The first period of “before the manipulation” is from January 1, 2013 to May 1, 2014. The second period of “during the manipulation” is from May 2, 2014 to December 30, 2016, which is set by Taiwan Securities and Futures Investors Protection Center (SFIPC, 2018) for the purpose of class action suit. The last period, “after the manipulation”, is from December 31, 2016 to May 17, 2017. Most of news (95 news) were published at the period of “during the manipulation”.

Number of News Events

We analyzed the topic and narration of the collected 143 news. These news can be divided into 16 news events; seven news events were in “before the manipulation”

period, eight events in “during the manipulation” period, and one event in “after the manipulation” period. Besides, we found that some news were published again and again for several times.

Fake News Reporters and Publishers

Based on the analysis results, we found that most of the 143 news reports were published by Newspaper D and A; newspaper D published the most of the news(75 news), and newspaper A is the second(59 news). The other nine news were published by companies B and C. Newspaper D is the major news media to publish news about Company P. Reporter A-1, one of the newspaper A’s reporters, had written 36 news through the research period, and 25 of his articles were with similar content with previous news (republished news). Reporter D-1, one reporter of the newspaper D, had 14 republished news. These two reporters trend to write similar news reports to company P again and again. Thus, we can conclude that most news about Company P were published by Newspaper D and A, and written by Reporter D-1 and A-1.

Authenticity of News Reports

Most business news about Company P revealed the company’s order or financial performance. We confirmed the authenticity of each news event with Company P’s quarterly financial reports and information on Market Observation Post system, in which all company should make public of their financial information.

We find at least four events were with question in authenticity of the news report, as mentioned below.

1. Increasing order

The first one was about the increasing order. There were always with news about increasing order of Company P, such as “Company P would have a significant increase of orders”, “Recommending Company P’s stock share”, and “With the developments of long-term care and biotechnology industry, Company P will gain some benefits”. In these events, the future of Company P was positively described by the reporters. These news reports may belong to advertorial news or news placement.

In “Company P will have a significant increase of orders” news reports, it was said that Company P would have a significant increase of order in the second or third quarter of 2013. But it is unreal when we checked the number of sales revenue and the net sales in Company P’s quarterly financial reports. The number of net sales in the first

quarter of 2013 was 273,610 thousand NTD, and the second quarter was 231,330 thousand NTD, and then the third quarter was 223,911 thousand NTD. It is obvious that there is no significant different between the number of these three quarters, and the number of net sales was even decreased in the second quarter. As a contrast, we compared these number with the sales number in 2012. In the first quarter in 2012, the number of net sales was 311,896 thousand NTD. And the net sales of second quarter was 515,369 thousand NTD. Actually, the amount of sales in 2013 was decreasing, so the description in the news report was not completely neutral and correct.

The news of “Recommending Company P’s stock shares” summarized the recent information of Company P’s stock shares, and recommended it. Content of all the serial news reports are similar with each other. All the news look like reprint of previous news reports, except with some minor revision. To clarify this argument, we calculated the cosine similarity and Jaccard similarity between all of our news database. After the analysis, we concluded that the similarity of the articles in this events are higher than the other news articles. The highest number of similarity between two articles is over 0.85 in both cosine similarity and Jaccard similarity. The high similarity coefficient reveal that the content of these news reports were almost the same.

The news report about “With the developments of long-term care and biotechnology industry, Company P will gain some benefits” also had same phenomenon of repeated news. The content of this serial news reports were similar.

Estimating the Number of Audience

The news distribution in cyberspace can be illustrated as Figure 1. Firstly, the company releases a news announcement to reporters, or the news reporters found the news event. Then, reporters write their news reports based on the news event and the news announcement. These news reports were then published in online news media as well as traditional news media. These news are published, reprinted, and share in the cyberspace. Stakeholders, including but not limited to internet users, investors and stock holders, employee, and the general public get the news from a variety of online websites/ platforms.

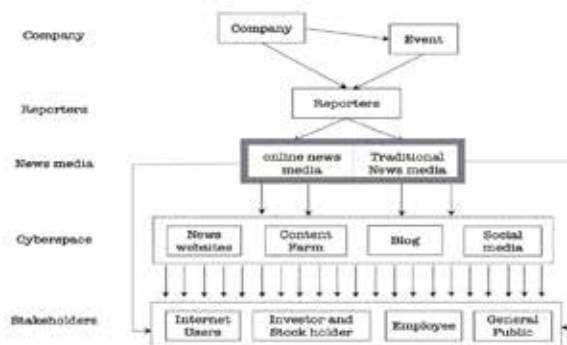


Figure 1 – News Distribution in Cyberspace

To reveal the influence of fake news, we have to investigate the number of potential audience of the fake news. We estimated the visits of all of the collected news reports by using the method which mentioned above. We applied appropriate method to estimate the visits of each news reports. This study used “the total visits to the news articles written by the reporters” to estimate the visit of news report in Newspaper A . Self-report visit times was used to estimate the number of audience of news story in newspaper D. For the newspaper B and C, we estimated the visit times of each news reports by using website traffic detection tools. We multiple the monthly traffic to the ratio of 0.054% to estimating the visit times of a news report. This ratio was calculated using the data of Newspaper D. Newspaper provide self-report visit times of each news article. We divided the self-report visit times to the monthly traffic of Newspaper D to get an average ratio of 0.054%.

Following are total visit times of each newspapers, which was useful to estimate the influence of the news. Based on the results, we estimated that these news were viewed by 213,699 times.

Table 2 - Estimated Amount of View Times

Newspaper	Total Visits
A	133,767
B	3,689
C	794
D	75,449
Total	213,699

Although the newspaper D published most number of news for Company P, the newspaper A has the largest visit numbers because of its vast audience.

News Reprint on Websites

People get news not only from official websites of newspaper, but also from websites which reprint or share the news. We searched all collected news in search engine to check if these news were reprinted or shared on other websites.

Based on the search results, we found six categories of websites which shared 172 times the news, including blog, online news website, financial agent website, some personal or official website, Internet forum, and Facebook. Among the six categories, blog played the highest proportion (98 times, 56.98%). The second one is online news website (31 times, 18.02%) .

Relationship between Positive News and Share Performance

On the Day of Publishing

We did statistical tests to analyze the transaction performance of Company P's stock shares. We found that when there was a positive news, both day range of stock price and turnover in value were significantly higher than the day which did not have any positive news. The rate of return was also significantly different between the days with and without positive news.

The Day Before Publishing

We also tested the day before the publishing of positive news. When there was a positive news in the next day, the day stock price range and turnover in value were significantly higher than the day which had not published any positive news in the next day, and so did the rate of return.

Comparing with other companies

There are enormous factors that will influence stock transaction. To confirm if the stock transaction of Company P was influenced by the published news, we compare the stock price of Company P and Taix (Taiwan Capitalization Weighted Stock Index). We also compare

the stock price of Company P with two companies in the same industry segment (Company X and Company Y). Taix represents Taiwan's security market at that time. Company X was a company which produces similar product with Company P. Besides, the capital of Company Y was with the closest to Company P's capital. All Company P, X, and Y were in the same industry segment.

We compared the rate of return of each target in different period after the publishing of Company P's positive news. There are four kinds of period, on the same day of news publishing, three days after news publishing, five days after publishing, and ten days after news publishing. We computed the rate of return in these periods, and tested whether there was a significant difference between each company.

On the day of publishing, the rate of return of Company P was significantly higher than the rate of return of Taix, and the rate of return of Company P was also significantly higher than both Company X and Y in three days after news publishing. Since there was no significant difference between Company P and other two target company X and Y in five days and ten days after news publishing, we found out that Company P only had a short term benefit in stock price after the news publishing of its positive news.

To understand how much the benefit was, we also computed the abnormal stock return of Company P, and tested whether there was a significant difference of abnormal return. We compared the abnormal stock return of Company P in different timing. When there was a positive news of Company P, the abnormal return, which was compare with Taix and Company X, was significantly higher than the day which did not have any positive news. We also tested the day before the publishing positive new. If there was a positive news in the next day, abnormal return, computed by Taix, Company X and Y, were significantly higher than the day which had no positive news in the next day.

Table 3 - The Relationship between Positive News and Stock Transaction

Variables	Mean (SD)		T value
	Day with news report (n=113)	The day without news report (n=955)	
Closing Price	54.16 (SD=16.38)	52.69 (SD=16.85)	0.879
Price Range	0.22 (SD=1.16)	-0.04 (SD=1.00)	3.766*
Turn Over in value	79,575,391.01 (SD=88,327,298.28)	46,177,616.13(SD=56,173,649.51)	3.927***
Rate of return	0.46 (SD=2.18)	-0.11 (SD=2.08)	2.724**
Variables	News published in the next day (n=113)	No news published in the next day (n=954)	T value
Closing Price	53.93 (SD=16.39)	52.75 (SD=16.82)	0.708
Price Range	0.55 (SD=1.36)	-0.08 (SD=0.95)	4.841***
Turn Over in value	88,228,675.33 (SD=96,980,253.74)	45,168,830.99 (SD=53,777,040)	4.636***
Rate of return	1.18 (SD=2.59)	-0.18 (SD=1.96)	5.384***

*, **, *** respectively mean statistically significantly different from zero with 90%, 95%, and 99% confidence.

Conclusion

In this paper, we discussed a real case of fake business news distribution in Taiwan. In this case, a Taiwanese company used news placement to manipulate its stock price and trade volume. We collected all news about the case company during a four year period (from January 2013 to May 2017). We analyzed the relationship between published news and stock price. We found that the published positive news of the company was relative with the stock price. When the news media published positive news to the public, the trade volume and price change might be increased due to the positive messages to the company. We introduce this case of fake business news to show the board influence of fake news (and news placement).

Based on the analysis of this real case, we argue that fake political news is not the only kind of fake news we should keep attention on. We should also keep attention on business news placement (and fake business news) and other kinds of fake news that will influence our daily life.

We got three major conclusions in the study. When checking the authenticity of each news, we found out at least several news events are unreal. For example, there were a lot of repeated “fake news” that distribute misinformation of “Company P will have a significant increase of orders.” However, these news cannot match the information on Company P’s quarterly financial reports. So we conclude the first research question that company may indeed release positive advertorial news and/or fake news. There existed some fake news (and paid news, advertorial news, and news place) in the case company’s news. We also found that most of these news was published by the specific newspapers and specific news reporters. We consider these newspapers and news reporters had collaboration relationship with the case company.

The second conclusion refers to the communication and distribution of the fake news (and paid news, advertorial news, and news place). We calculated the view times on the web page of each collected news. We estimated that the collected fake news (and paid news, advertorial news, and news place) was viewed 213,699 times on the newspaper websites. Besides, these collected news were shared

or reprinted in other websites. We estimated that these shared and reprinted news in other websites were viewed 178,434 times. The view times were underestimated since it is not easy to estimate view times of individual blog. We believe the actual view times is much higher than our estimate. Besides, when comparing the ratio of each kinds of websites, we found that many blogs sharing fake news in their blog pages. We believe that it is because of the bloggers did not have enough knowledge about fake news.

The last conclusion of the study is that fake news would indeed influence stock price. We found that there was a significant difference between days with and without news reports in stock price, turnover, return rate, and abnormal return ratio between the day. However, we also found that the influence of fake news on stock price was short-term effect. When consider a period of five days or longer, the stock price back to normal. Thus, fake news can be used to stock speculation in short term. Nevertheless, the stock price would back to normal if the company is not as good as mentioned in the fake news.

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A Conceptual Framework for Product Design and Development Support System (PDDSS) for Small and Medium Enterprises (SMEs)

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Abstract

Managing design is vital to Small and Medium Enterprises (SMEs) in order to increasing competitive advantage. Although there are many design supporting agencies, the problem is most of them does not aware the importance of design in product design and development support process. The purpose of this study is to shed more light on the capabilities of supporting agencies and needs of SMEs. Method of the study is to derive a conceptual framework for Product Design and Development Support System (PDDSS) for Small and Medium Enterprises (SMEs), based on literature review which related in product design and development, design management, design support, design ecosystem. The results show guidelines of how to manage product design and development support system. The study contributes to the understanding of design support process to enhance SMEs' competitiveness.

Keywords

Design, Product Design, Design Management, Design Support, Design Ecosystem, Supply chain, Support System, Product Development, Small and Medium Enterprises (SMEs), Competitive Advantage.

Introduction

Product Design is an important element to add value and differentiate products in supply chain. It is an essential resource for business which helps to create innovation and competitive advantage (Dell'Era, Marchesi and Veganti, 2010; Design Council, 2004). Cox review (2005) supported that design can also increase quality of product and improve production flexibility. Importantly, design also as a main factor that can create inside value of products. Identity of product can be a competitiveness to maintain product sustainably (Mozota, 2006, NESDB, 2018).

From literature review, it apparently found that in supporting process of product design and development lacks design management and design support in supply chain (Mozota, 2006). Product design and development

is very important to help increase the potential and create competitive advantage for entrepreneurs in all the stage (upstream, midstream, and downstream). All the stage (upstream, midstream, and downstream) in supply chain should be considered. Supply chain is a process of management in design process, manufacturing and delivery (Yusuf, Gunasekaran, Adeleye, Sivayoganathan, 2004).

In supporting process of the product design and development, supporting agencies has been supported entrepreneurs or Small and Medium Enterprises (SMEs) which act as intermediaries in providing general information to help entrepreneurs. But these agencies do not have adequate knowledge and are not specialized in product design and development process in each stage of supply chain. (North, Smallbone and Vickers, 2001).

Therefore, most entrepreneurs or SMEs do not have design knowledge, they may neglect the importance of design (Brazier, 2004; Abdullah, Zahari & Lamat, 2013). Although, they aware the importance of the product design, they cannot afford design cost which is expensive. Most of them do not use design in the product design and development process.

To increase the potential and create competitive advantage, design management help educate an awareness of the importance of design and help differentiate products in each stage of supply chain for SMEs. Moreover, design support and design ecosystem also help support design in product design and development process with a strong networking in all relevant expert networks who are specialized in design to help reduce resources such as time and costs. The strong coordination between all stakeholders in design support and design ecosystem is essential to create an efficient operation (Acklin, 2010; Mozota, 2002). This will eventually enhance the company's competitive advantage and create higher value products.

Therefore, to help SMEs to operate business more effectively, there should be an integration of design management, design support and design ecosystem to a holistic support in each stage of supply chain from upstream, midstream, and downstream.

In this paper, our research question is to investigate factors in a product design and development support system that can increase the potential and competitive advantage for SMEs. The paper presents theoretical findings related to problems of SMEs in product design and development, supply chain management, design management, design support & design ecosystem and build a conceptual framework of the Product Design and Development Support System (PDDSS).

Problems of SMEs in Product Design and Development

The literature review shows that the problems in product design and development and limitation of small and medium-sized enterprises consist of six main problems.

First, a lack of design skills and design experiences in product design and development process. Most entrepreneurs are not to increase the value of their product during a designing product. (Cox review, 2005; Acklin, 2010; Wainwright, 1995; Abor and Quartey, 2010; Acklin, 2013).

Second, a lack of awareness of design. SMEs are not aware of the importance of product design. Due to costly in design, SMEs give important to design their brands more than design products (Acklin, 2010; Salminen, Rinkinen and Khan, 2015; Brazier, 2004).

Third, difficult to access expert designers. In process of design sourcing in design management, SMEs cannot find the expert designers to help them design product (Acklin, 2013; Cox review, 2005; Brazier, 2004). Bruce, Cooper and Vazquez (1999) supported that design sourcing, design briefing and evaluate of design are also most problems that occur in small business. Importantly, hiring professional designers may not support whole product design and development process, there are other factors that effects on SME' operations, for example in financial and marketing problems, etc. (Bruce, Cooper and Vazquez, 1999).

Fourth, limited opportunities in marketing. Both domestic and international partnerships is limited for SMEs to expand markets (Abor and Quartey, 2010; Lauder, Boocock and Presley, 1994; North, Smallbone and Vickers, 2001; López-Claros, Altinger, Blanke, Drzeniek and Mía, 2006).

Fifth, financial problem. According to Wainwright (1995), the design has a very high cost of up to 70 percent of the total product cost. Cox (2005) supported that the problem of product design and development has never been resolved. It has been neglected by most SMEs due to its high cost.

Finally, problems of a complex access technology, resources, policy and laws. Most SMEs have problems in high level of access technology, limited resources in operation and conducive policy and laws to operations (Abor and Quartey, 2010; North, Smallbone and Vickers, 2001; López-Claros, Altinger, Blanke, Drzeniek, and Mía, 2006).

The problems of SMEs in product design and development process allows us to conclude factors in a product design and development support system that can increase the potential and competitive advantage for SMEs which is illustrated in Table 1.

Table 1 - Variables of SMEs problems in product design and development

Variables of SMEs problems	Supporting Literatures
Product design and development	Cox review (2005); Acklin, (2010); Wainwright, (1995)
Skills; management and design etc.	Abor and Quartey (2010); Acklin (2013)
Awareness of design	Acklin (2010); Salminen, Rinkinen and Khan (2015); Brazier (2004)
Access expert designers	Acklin (2013); Cox review (2005); Brazier (2004); Bruce, Cooper and Vazquez (1999)
Marketing	North, Smallbone and Vickers (2001); Abor and Quartey (2010)
Financial	Abor and Quartey (2010); North, Smallbone and Vickers (2001)
Access technology	Abor and Quartey (2010)
Resources	North, Smallbone and Vickers (2001)
Policy and Laws	López-Claros, Altinger, Blanke, Drzeniek, and Mía (2006); Abor and Quartey (2010)

Supply Chain Management

Chang (2009) defined the supply chain management as essential process for competitiveness. In general, main activities in supply chain comprises of networking process in operation, which is buy material, product processing and deliver finished product by distribution to customers. Supply chain involves suppliers, manufacturers, distributor and customers. An effective supply chain ensures a competitiveness of the product.

However, there are some bottlenecks in supply chain. Bottleneck causes constraints or limitations in production process of organization. If the organization has not resolved the bottleneck, production process will take time and costly. Therefore, coordination to work together in supply chain will help production process more efficiently. In addition, Lau, Huang and Mak (2004) supported coordination in whole system of supply chain can enhance performance in organization.

Design management

In order to create a successful product design and development process, entrepreneurs need to have strong knowledge in design management. It helps increase competitive advantages.

Mozota (2006) defined design management as concepts that bridge the gaps between designers and managers includes customer, performance, learning and financial value perspectives. These are various perspectives of design to add value and manage design function and performance.

Cooper, Junginger and Lockwood (2009) added that perspectives of design management in three contexts; the context of manufacturing which integrates product design and development with all stakeholders (engineers, marketing experts, designers); brand & marketing context which creates a policy or program of educational design; and organization & society context in multidisciplinary with academics in sciences, social sciences and human sciences to manage design problems in the society.

Moreover, design management capability should be considered in resource-based view. According to Fernández-Mesa, Alegre-Vidal, Chiva-Gómez, & Gutiérrez-Gracia (2013), analyzed resource-based view to find specific resources in product innovation which can build business competitive advantage.

In addition, Sebastian & Prins (2009) added that design management linked among designers, design process and product that is designed. They highlighted design organization through business strategy and coordination in design team.

When implementing design management, many contexts should be considered. The contexts influence on product design and development process.

Table 2 – Variables for supporting SMEs

The Supply chain in supporting SMEs	Variables for supporting SMEs	Supporting Literatures
Upstream	Policy	Cooper, Junginger and Lockwood (2009); Leles (2018); HKSTP (2019); Whicher and Walters (2017); Raulik-Murphy, Cawood, Larsen and Lewis (2009)
	Funding/ Financial	Leles (2018); HKSTP (2019)
	Long term strategic planning	Raulik-Murphy, Cawood, Larsen and Lewis (2009)
	Incubation/ Education	Cooper, Junginger and Lockwood (2009); Leles (2018); HKSTP (2019); Whicher and Walters (2017)

Midstream	Design management and Design Support (design sourcing and design briefing, etc.)	Mozota (2006); Mozota (2002); Brazier (2004); Bruce, Cooper and Vazquez (1999); Cooper, Junginger and Lockwood (2009); Leles, (2018); HKSTP (2019)
	Design/Product Design and Development	Dell'Era, Marchesi and Verganti (2010); Design Council (2004); Cooper, Junginger and Lockwood (2009)
	Design team	Leles (2018); HKSTP (2019); Whicher and Walters (2017)
	Network	Dell'Era, Altuna, Magistretti and Verganti (2017); Cooper, Junginger and Lockwood (2009)
	Multidisciplinary	Cooper, Junginger and Lockwood (2009); Bucolo and Matthews (2011); Leles (2018); HKSTP (2019); Sebastian & Prins (2009)
	Production	Cooper, Junginger and Lockwood (2009)
Downstream	Marketing/Trade/ Design promotion	Cooper, Junginger and Lockwood (2009); Leles (2018); HKSTP, (2019)

Design support and Design Ecosystem

Both, design support and design ecosystem are keys to help increase competitive advantages.

In general, an ecosystem is defined as a community system of interacting and supporting which linked each other and environments. According to Raulik-Murphy (2009), the design system consists of four elements including support, promotion education and policy to gain maximum advantage. Next, Whicher and Walters (2014) developed "Design Innovation Ecosystem" which consists of Design actors, Design promotion, Design support, Design Policy, Design Users, Design research, Design Sector, Design Funding and Design Education.

In this study, design ecosystem is defined as a community system of interacting and supporting which linked the stakeholder in supporting the product design and development process. We found that there are different name for design ecosystem in each country. But all of them are supporting the entrepreneurs.

For a design support, Brazier (2004) defined design support as a tool for the entrepreneurs to use when communicating with designers. A design support includes seven main steps; background, aims of the company, image, target market, scope and designer selection. The design support

should be carried out by the supporting agencies to advise SMEs in a product design and development process. A good support can help SMEs reduce cost and financial risk. (Salminen, Pieter Ballon, Rinkinen, & Khan, 2015).

For example, in Japan called design eco-system, Hong Kong called HKSTP's ecosystem, Italy called Design system, Finland And Brazil called the National design system, Wales and Scotland in the United Kingdom called the design innovation ecosystem (Leles, 2018; HKSTP, 2019; Raulik-Murphy, Cawood, Larsen and Lewis, 2009; Whicher and Walters, 2017).

A supporting process for product design and development can be in many forms. Supports occur throughout activities in supply chain and can come in various forms such as government policy, education, financial support, design promotion, etc.

In the government policy, government have planned the design policy to develop design products in the economy (Leles, 2018; HKSTP, 2019; Whicher and Walters, 2017; Raulik-Murphy, Cawood, Larsen and Lewis, 2009). SMEs can also be supported during a design process. They can get help from experts such as professional designers in product design and development process (Leles, 2018; HKSTP, 2019; Bucolo and Matthews, 2011; Dell'Era, Altuna, Magistretti and Verganti, 2017). A strong network among experts can be established in order to assist SMEs. Due to unclear design policy, SMEs may lack of intermediaries in linking them with other stakeholders in support process (Leles, 2018; Biggs and Shah, 2006).

Providing the design support in Serbia and Austria, there are support SMEs in too general which is not suitable to the SMEs' problems. (Rakićević, Omerbegović-Bijelović and Lečić-Cvetković, 2015; Wiggins, Kirsten and Llambi', 2010; Vrgovic, Vidicki, Glassman and Walton, 2012). This may refer to customize the insight of entrepreneurs what they need to solve in the product design and development process.

In Hongkong, the product design and development process of supply chain are supported by the support agencies. A strong network to help entrepreneurs is established. This creates a collaborative learning environment to SMEs. Similar to Japan, the support agency, JIDPO, helps integrate the Japanese culture to increase cultural value with the Japanese goods and services during midstream activities. Similarly, In Brazil, activities during downstream activities are strongly supported through

design promotional activities. In Germany, a support agency assists SMEs with technology.

However, the more levels of bureaucracy are, the more problems of support services caused such as technology assistance (Leles, 2018; HKSTP, 2019; Hassink, 2002). Patzelt, and Shepherd (2009) added that the steps of services is high in Germany which effects to entrepreneur's business development. Therefore, to facilitate the technology assistance, supporters can establish support services which can easily be reached by SMEs.

An educational support refers to specific design program from universities, public or private sector to build an awareness of the importance of design (Leles, 2018; HKSTP, 2019; Whicher and Walters, 2017; Tötterman, and Sten, 2005). Raulik-Murphy, Cawood, Larsen and Lewis (2009) supported that lack of quality of education cannot build a potential of entrepreneurs. A financial support is for entrepreneur when investing in design and this may boost up the competitiveness (Leles, 2018; HKSTP, 2019).

In design promotion, there consist of awards, exhibition and marketing.

Awards can encourage entrepreneurs to create a new design product to win prizes as a symbol of successful in design. There are many well-known design awards; Good Design Award (G-mark) in Japan, Red Dot Design Award and iF Design Awards in Germany, etc. (Leles, 2018; iF world design guide, 2019).

Exhibitions can promote design in public. For example, Designhub (2019) in Japan, Tokyo Midtown Design Hub can link different roles in design network; "people", "business" and "knowledge" and Salone del Mobile. Milano (2019) in Italy, the Salone Internazionale del Mobile can promote Italian furniture and design accessories. These exhibitions can act as a promoter of creative products to global markets.

Marketing including distribution and matching venture capital are also essential of entrepreneurs to commercialization in the product design and development process. In HKSTP (2019) there are matching venture capital and entrepreneur to expand product. Moreover, offering opportunities of trade in country and international to promote product to global market (North, Smallbone and Vickers, 2001; Liu, 2008)

From theoretical of design management, design support and design ecosystem can be analyzed to variable of supporting factor and problems as shown in Table 2 and Table 3

Table 3 - Variables of supporting problems

The Supply chain in supporting SMEs	Variables of design supporting problems	Country	Supporting Literatures
Upstream	Unclear design policy	Italy	Leles (2018)
		Un Sub Saharan Africa (SSA)	Biggs, and Shah (2006)
	Government change	Brazil	Raulik-Murphy, Cawood, Larsen and Lewis (2009)
	Short term strategic planning	Brazil	Raulik-Murphy, Cawood, Larsen and Lewis (2009)
	Weak technology	Brazil	Raulik-Murphy, Cawood, Larsen and Lewis (2009)
	high levels of bureaucracy	Brazil	Raulik-Murphy, Cawood, Larsen and Lewis (2009)
		German	Patzelt, and Shepherd (2009)
	Lack of quality of education	Brazil	Raulik-Murphy, Cawood, Larsen and Lewis (2009)
Midstream	Provide general support information	London Lee Valley, North East London	North, Smallbone and Vickers (2001)
	Lack of communication between support agencies	Brazil	Raulik-Murphy, Cawood, Larsen and Lewis (2009)
	Lack of intermediary role between SMEs and other players	Un Sub-Saharan Africa (SSA)	Biggs and Shah (2006)
	Matching service	Developing countries	Vrgovic, Vidicki, Glassman and Walton (2012)
	Support services may not match the needs of SMEs	Serbia	Rakićević, Omerbegović-Bijelović and Lečić-Cvetković (2015)
		Austria	Wiggins, Kirsten and Llambi (2010)

Product Design and Development Support System Framework

From literature reviews, we developed A Conceptual Framework for Product Design and Development Support System (PDDSS) for Small and Medium Enterprises (SMEs) which build an academic contribution for design support ecosystem.

To increase productivity, effectiveness and competitive advantage for SMEs. The factors from design management, design support and design ecosystem to a holistic support in each stage of supply chain from upstream, midstream, and downstream should be integrated in product design and development process. This will help activities in the whole supply chain support.

In this study, we integrate supporting activities in three stages of supply chain from upstream, midstream, and downstream. We found that 16 supporting activities from the product design and development process should be integrated in each process. The main findings focus on sixteen supporting factors in the process as follows;

- 1) Upstream consists of six factors, including having clear government policies, financial, quality of education, assessing the insights of clients, provide level of competency of supporters and ease of access in supporting services.
- 2) Midstream consists of seven factors, including design management, design support (Including finding designers and design briefing), product design and development, production, technology assistance, strong networking and communication in multidisciplinary
- 3) Downstream consists of three factors, including design promotion, matching venture capital and commercialization.

The benefits of this research framework are proposing guidelines of supporting activities in the whole supply chain for all stakeholders to manage the support appropriately. Moreover, it will improve income and higher GDP. Finally,

it may lead to further economic development for the country as well. (Vrgovic, Vidicki, Glassman and Walton, 2012; Porter, 1985).

However, the research framework has been no validation. This may cause some supporting factors to affect the

product design and development support process. A Conceptual Framework for Product Design and Development Support System (PDDSS) for Small and Medium Enterprises (SMEs) was developed as shown in Figure 1

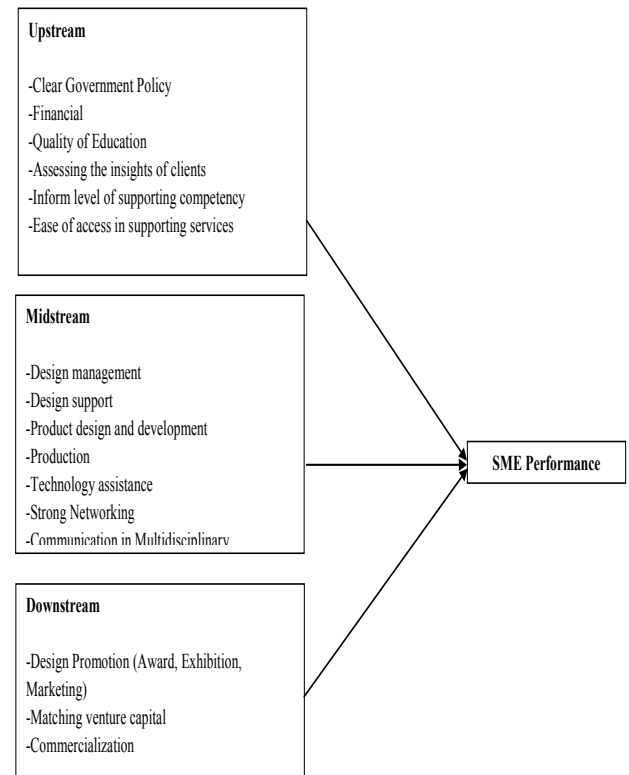


Figure 1 - A Conceptual Framework for Product Design and Development Support System (PDDSS) for Small and Medium Enterprises (SMEs)

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Study on the Effect of the Emotional Knowledge on the Global IS Project Manager's Agility

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Abstract

The agility of the global IS project manager is regarded to be important for the success of global IS project. The past research focused on identifying the critical knowledge required to improve the project manager's agility, which include system knowledge, business knowledge, project management knowledge, interpersonal knowledge and cultural knowledge. The objective of this research is to investigate the moderating effect of the emotional knowledge on the global IS project manager's agility and the global IS project success.

A sample of global IS project managers were surveyed to assess the impact of the emotional knowledge. This study found that the emotional knowledge moderates the effects of business knowledge, project management knowledge, interpersonal knowledge and cultural knowledge on the agility of the global IS project managers. The study results also show that the emotional knowledge influences on the agility of the project manager directly and the global IS project success directly.

The results have important practical implications on how organizations build the capability of the global IS project managers to lead to the success of global IS projects. This research emphasizes that the training and education of the global IS project manager should consider the emotional knowledge. The level of the agility for the global IS project manager is improved not only by increasing the level of various cognitive knowledge but also by increasing the level of the emotional knowledge.

Vanet as a Component of Intelligent Transportation system

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Abstract

Slow Mobility & traffic bottlenecks has become the major issue in most of the cities of the world. The traditional methods of controlling the traffic monitors the traffic flow but helpless to eradicate the traffic congestion problem, which in turn give rise to problems like accidents, fuel consumption, air & noise pollution. Vanets are the promising solution over the traditional methods to improve the traffic flow and helps provides many safety applications & non safety applications. Many countries like USA, JAPAN, EUROPE has already implemented many of its Vanet based projects. The main objective of Vehicular networks is to ensure the safety of its end users and to decrease the accidents rates as well as can be used for infotainment purpose. This paper gives the review about the potential solutions based on vehicular networks and attempts to highlight its performance for safety and non-safety applications.

Keywords

Vanet, Intelligent transportation system, routing protocols.

Introduction

Mobility in urban areas have always been a talk of research almost in all countries of the world. Urbanization, Globalization has created opportunities to major urban population as well as given opportunities to the rural population. This brings major population to the urban cities and makes the transportation conditions staggered. The number of vehicles being registered keep on increasing every year. Unfortunately, to support the growth of population and increasing number of vehicles the infrastructure can't increase in same pace. The unmatched equation of traffic supply and travel demand give rise to major issues like traffic congestions, increase in number of accidents, air pollution, fuel consumption, noise pollution. This creates situation of havoc in the cities which increases the risk of accidents, death rates, impacts the behavior of drivers, and impacts the quality of life of people & makes them prone to health risks. The reason behind this problem is the poorly and obnoxious development of road networks and the poorly organized traffic management techniques. Due to such adverse effects

and complexities, the researchers have proposed the ideas to integrate virtual technologies to assist the transportation field, which refers to the making infrastructure act smartly that is only possible by Intelligent Transportation Systems(ITS) [Quresh et al,2013].The motivation behind the ITS highlights the progressive increase in cities population, where traditional and semi automation traffic control measure are for controlling and regulating traffic volumes but still the traffic bottlenecks are still major issues of transportation which can be avoided if the prior information can be given to the drivers before occurrence of it through different kind of sensors, video information analysis, etc which becomes the backbone for the data incoming in the vehicular networks.[Rizwan .p et al,2016] Vehicular networks are component of Intelligent Transportation System which itself works as sender to transmit the messages wirelessly to communicate with other vehicles. Vehicular network is the collection of vehicles that are connected wirelessly to each other and has the ability to exchange information among themselves or with the infrastructure, which reflects the intelligence part of it.

The purpose of the survey is to bring out the current research issues in vehicular communications. The paper surveys the different mobility models and simulators used for Vanets. It also focusses on the various Vanet based solutions for enhancing safety & comfort .It also highlights the protocols, new architecture, data dissemination techniques of the Vanet.

Literature Review

VANET as a component of ITS

Intelligent Transport system is the system of connected devices like sensors, actuators through internet which helps in gathering the data & processing information with the application of analytics. The applications of Intelligent transportation system are not only limited to the highway traffic but also it provide services to the Air transport, navigation system & water transport system. All the devices are connected through internet which forwards the required information to its end users. These end users can be travelers, emergency service providers and many more. ITS in context to vehicles refers to the intelligence of vehicles to act as sender which gathers, process and transmit the information to the other vehicles. [Targe et al, 2016]. Due to advancement in wireless technologies the Vehicular networks project have been adopted by governments in the world. The author [Bhoi.S et al, 2013] has discussed about the various project that have been implemented in Japan, Europe & USA. But the main concern about these project were related to security issues. The Berkeley path project of US and the fleet net project of Germans are for vehicular networks but none of them has focused the security aspects in the Vanets. The European projects like Projects on wheel (NoW) and Global System for Telematics (GST) has considered the security issues of the Vanet. New European project SEVECOM has addressed the problem of the security of the exchanged messages. It provides full security in the exchange of messages by incorporating Cryptography of the messages [Raya. M et al, 2006].

VANET Architecture

Vehicular networks are classified into three categories which refers to the Vehicle to Vehicle (V2V), Vehicle to Infrastructure (V2I) and Hybrid (vehicle –vehicle-infrastructure)[Giang et al,2013]. The basics behind these three model are Vehicles are equipped with OBU (On Board Units), GPS (Global positioning System), and ELP (Electronic License Plate). Each unit has been installed in

the vehicles to serve the specific purpose. On Board Units which are configured to work on IEEE 802.11p standards makes the vehicles capable to work as sender and receiver. The GPS Installed in the vehicles helps in determination of the position of the vehicles. And ELP are the unique Identification Id of the vehicles. The Infrastructure used in the V2I communication has RSU (Road Side Unit) installed in the them, which are also configured to work according to IEEE 802.11p Standards. As the OBU & RSU are configured to work on the same frequency (5.9GHz), it will ensures the wireless communication among them. For secure data dissemination the V2V architecture uses Muthop (Broadcasting) schemes which is carried into two ways. The broadcasting in the form of beacons which are generated at regular intervals produces a large number of messages causes the chances of the collision in the exchange of information. Hence, another way is to broadcast the message on the generation of demand. This method removes unnecessary message generation and collision [Giang et al, 2013]. It discusses about the various data dissemination schemes used in Vanet safety and infotainment applications.

VANET Standards

The author [Anwer et al, 2014] has proposed the vehicular communication technologies. They have shown the classification criteria of the technologies used in Vanet based on the signal range. Since, Vanet are characterized by dynamic topology hence short range communication is preferred in them. On the basis of signal range, communication technologies can be Long range, Medium range & short range.

DSRC

DSRC (Dedicated short range communication) comes under the category of medium signal range. It was exclusively developed for the vehicular adhoc networks which follows the standard of IEEE802.11p. Since the Vanet is self-organizing, self-coordinating & high mobility network hence it demands the standards that are especially developed for such requirements. Depending upon the countries DSRC frequency spectrum range & frequency varies .The DSRC frequency spectrum & radio frequency for US is 75 MHz & 5.9 GHz respectively, for European countries it is 30 MHz & 5.8 GHz respectively. It is suitable for both V2V & V2I type of architectures in Vanet. It provides data rate of 27 Mbps & covers the range of 1000m [Anwer et al, 2014]. It has 7 seven channel in

its spectrum out of which 6 channels are used for service providing and one control channel which is dedicated to safety applications. The author [Yin .J et al, 2004] proposed the performance evaluation of Vehicular networks for the collision avoidance safety application on DSRC module. They found the performance metrics latency & throughput for the single hop broadcast transmission are performed satisfactory for the safety application point of view.

WAVE

WAVE (Wireless access in vehicular Network) provides wireless communication for vehicular networks. The low latency requirement for safety application in Vanet demands the high data rate transmission, due to which DSRC was renamed IEEE 802.11p WAVE by ASTM 2313 working group [Deng.D J et al, 2011]. WAVE standard uses OFDM modulation techniques for data transmission and it consist of OBU & RSU units, between which the communication will be established. WAVE has standards for MAC & PHY layer that works on the different applications. IEEE 1609.1 for the application filed, IEEE 1602.9 for security mechanism, 1609.3 for wave management mechanism & for 1609.4 manages data link layer. [Anwer .M S et al, 2014].

Routing

The high mobility and dynamic topology gives rise to many research issues in VANET for find out the best routing protocols that could be used for collision avoidance and road accident prevention applications. The author [Yasser et al, 2017] mentions the criteria for choosing the routing protocols that depends upon the characteristics like mobility, scalability, network architecture, dynamic topology. This makes the design and selection of routing protocols a very critical issues. The author [Li.F et al, 2007] has classified the routing protocols into 5 categories namely topology based, adhoc based, broadcast based, geocasting based and adhoc based. The adhoc based routing are AODV, DSR which has the espacility to maintain the routes on demand.

However, the performance of these protocols are subjected to the networks where traffic flows are very small. The simulation results carried out for VANET based on Adhoc routing protocols have shown poor performance in terms of low route coverage area and low throughput. Vanet for safety applications can't afford delay in data transmission as these are real time applications. Hence more research studies have been conducted to find more

efficient protocols that can meet the requirement of Vanets. To improve the performance AODV in terms of route coverage and untimely route breakage the authors have proposed the improvised versions prediction based AODV protocols (PRAODV, PRAODVM). PRAODV predicts the shortest as well as the alternate route before the lifetime expiration of existing route. However, the PRAODVM predicts the maximum lifetime path among various existing routes. The simulation results shown the improvement in the performance metrics related to the packet delivery ratio. Due to the mobility model used for the simulations of vanet network the need to generate the realistic environments brings out the movement constraint along the roads, direction s of the vehicles, highway or urban city scenario etc. Hence position based routing protocols helps in providing the best results from the data collected by traffic generators models, street maps. The positon based protocols always (GPSR) always forwards the packets to the vehicles which are closer to the destination vehicle. Hence these routing paradigm also need improvement cause GPSR performance varies in Highway to city scenarios. For highway scenario where less obstruction were present it outperforms compared to other Routing protocols [Fubler.H et al, 2002] and to the city scenarios it performance degrades. Many other existing position based routing protocols are GSR, ABS, GTAR and so on. They only problem it suffers is on increasing the network load the performance of position based routing protocol degrades. To provide services for the larger networks and to meet the requirement of the scalability characteristics of the vanet another category of the routing protocols is Cluster based routing [Kumar et al, 2011]. The larger area is divided into cluster depending upon the no of vehicles present and the exchange of information occurs between the clusters. This routing scheme based on the formation of cluster heads in the cluster. The cluster head exchanges the messages to the other cluster heads. The cluster based routing protocols are CBR, CBLR, HCB etc. The limitation of these routing protocol is it takes a lot time in the transmission of messages between the clusters. The other category Geo cast based routing protocol works on the flooding and non-flooding technique which requires within an area or the zone of the message transmission [Kumar et al, 2011]. The only benefit it provides is it reduces the chances of collision of data between the vehicles. Few geo cast routing protocols are DRGC, DTSGC etc. For the V2V & V2I architecture of Vanet another category of the vanet

protocols are proposed that works on the Broadcasting schemes. The broadcasting routing protocols are used to transmit the information related to traffic, weather, emergency & road conditions. The broadcasting scheme can be single hop between the nearby vehicles and can be Muthop depending upon the larger area to be covered. This techniques guarantees that the target vehicles will receive the message but it has shortcoming like it consumes more bandwidth, interference, poor performance if load increase in network due to collision between the packets [Li.F et al, 2007]. Few Broadcast routing protocols are UMB, VRADE, and HV-TRADE.

Secure Routing Protocols

Many routing protocols have been studied and applied to the Vanets for safety & non safety applications. To deal with security of the messages in transmission many method have been employed like Digital Signature, Public Key Infrastructure etc, to make the system resistive to potential threats of the attackers. The author [Bhoi.S .K et al, 2013] mentions the secure routing protocols in Vanet which are ARAN, ARIDANE, CONFIDANT, SAODV, SLSP, SLOR etc. Among them ARAN, SAODV uses Adhoc based routing protocol AODV but with authentication scheme during route discovery. ASLOR is the secure OSLR which prevents the attacks on the message packets. The future research lies relating to the security issues in vanet as it needs the robust and secure routing protocols as well as robust secure architecture.

Data Dissemination Techniques in Vanet

The data dissemination refers to the transmission of data wirelessly in the network.[Giang.A.T et al,2013] Data dissemination in Vanet can be performed through single hop or multi hop schemes depending where vehicles act as the data carrier itself[Dubey B.et al,2010].In the vehicular networks data transmission is a very tough task as the vehicles are subjected to move in a prebound pattern of the road topology and the vehicles collecting the data of incidents,traffics,road conditions has to keep it with themselves until it gets another probable vehicle nearest to the zone range. This makes the vehicles to process and select the most probable route to reach that nearest vehicle .Hence, only a probability estimation can be done to choose the path for minimizing the latency in delivering the packet for safety and collision avoidance incidents. Even though the information regarding parking services, advertisements can be done through third generation

wireless activities but it is costly and infrastructure based activity, but vanet can provides these services without the dependency on infrastructure .In paper [Zhao J et al, 2008] the author has proposed the vehicle assisted data delivery system for those vehicles where little time delay in packet transmission can be overlooked. The data transmission techniques based on different schemes are push pull, carry forward, cluster based and farthest node mechanism [Giang .A T et al,2013].To perform perfectly, these schemes demand the high bandwidth and buffering capacities to store data for the vehicles in the range and the vehicles approaching to the respective zones. In push pull data dissemination schemes the data which is most important can be sent directly to the vehicles in emergency situations or in pull approach it is requested by the vehicles from the data centers and are forwarded to them. This model is generally preferred for safety mechanism, collision avoidance systems & any emergency related services. The carry forward approach address the vehicles moving in the same direction of the packet propagation and it forwards the packet to the same vehicle. The application of any of these schemes requires to fulfill the criteria of the limited network bandwidth, particular road topology etc. [Zhao J et al,2008].

Traffic Control through Vanet

The literature studies shows that to meet the travel demand and to increase the reliability of on the transport systems, v2v communications have been incorporated in the traffic control systems to regulate the flow of traffic on roads, on intersections. In the paper [Li L et al, 2014] the author has compared several traffic control researches done in the literature using V2V. These traffic control techniques based on V2V can be model based predictive and can be simulation based. In the model based prediction traffic control the traffic flow at the current location can be estimated by the difference equations and using them the future prediction can be done. It helps in forecasting the traffic flows but it is not able to predict the dynamics of traffic flow with respect to time hence researches are relying on the simulation based traffic flow [Baskar L.D et al, 2012]. The simulation based traffic flow models are based on the Intelligent Transportation Systems, where they are modelled and analyzed to control the traffic flow [Wang F.Y et al, 2010]. In the other category the author [Li L et al, 2014] has shown the comparison between planning based and self-organized based controls. The planning based model depends upon the road networks

topology and tries to bring more realistic solution soft h problem but they are subjected to the constrained of the road network. The self-organized control refers to the short term controls that can be changed according to the need.

Vanet Simulators, Network Simulator & Mobility Model

Mobility Model

To bring out the realistic view of the road network the mobility model or traffic generators are used in VANET to study the road network characterstics. These mobility model are the set of rules that are followed for the designing of the road networks. Since Vanet are based on the movement of the vehicles on the road hence it becomes important to choose the best realistic model. The mobility model is used to determine the characteristics of the traffic flow in terms of the vehicle density, travel time, mean speed of the vehicles etc. The model can be broadly classified into two categories which are Macroscopic and Microscopic models. The macroscopic model gives a holistic view of the road networks covering the major road, intersections, junctions, light etc. the microscopic model talks about the microscopic view of the roads that is it focuses only on the behavior of the vehicles travelling on the road. The author [Harri .J et al, 2009] has proposed the categorization of the mobility models like Synthetic models, Survey based model, Trace models & Traffic simulator models. The synthetic models are based on the mathematical models, which can be further classified into different classes like stochastic, traffic stream, car following, queue model & behavioral model as mentioned in by author in [Fiore .M et al,2007]. The mobility generators used for the Vanet are SUMO, MOVE, City Mob, FreeSim, VanetMobiSim.

Network Simulators

The simulators used for vanet have been discussed in [Martinez F et al ,2011] by the author where the taxonomy of the mobility model, network simulator and the Vanet simulator has been illustrated. The function of the mobility model is to generate the real scenario of the road topology for vanet and the network simulator are used to perform the data traffic dissemination from source to destination including the roads ,links and the channels. The network simulator used for the Vanet are ns-2, GTnetS, GloMoSim.

Vanet Simulators

Currently, the two Vanet simulator exist that contains the Network simulator and mobility generator on the same framework as mentioned in the paper [Whaiduzzaman M et al]. The vanet simulator is the software that allows one's to change the behavior of the vehicle is known as Vanet simulator.[Whaiduzzaman M et al]They are TraNS which is written in Java & C++ and runs on LINUX & Windows. The second is MobiREAL that describes the mobility of the nodes with the help of C++. In [Whaiduzzaman M et al] the author gives the comparison between the vanet simulators as well as comparison between all three mobility model, network simulator and Vanet Simulator.

Vanet Applications:-

Vanet are generally designed for safety & non safety applications. Both the V2V & V2I communication models helps in bringing information to its end users their by making them gain better services. The following table enlists the safety & not safety applications.

Name	Application Type
Intersection violation warning	Safety
Work Zone Warning	Safety
Traffic Information	Safety
Collision warning	Safety
Lane change Warning	Safety
Emergency vehicle approaching	Safety
Post-Crash Notification	Safety
Electronic Toll collection	Non Safety
Parking availability	Non Safety
Enhance route guidance	Non Safety
Service Announcement	Non Safety

The above mentioned applications are the mentioned in the [Hartenstein et al 2010, Kumar V et al, 2013, Amadeo M et al 2012].

Current Research Issues in Vanet

Due to dynamic characteristics of Vehicular networks it has given rise to research in many fields and many fields finds its future research areas. The problem of Data storage & management in Vanet has given rise to the

implementation of the cloud services, IOT to provide the information at the edge IT where information requirement is necessity and the processing can be done easily, rest of the data which is not for the urgent requirement are sent to the data clouds where further processing of the data can be done easily. The vehicles which need data urgently & has internet access can access the data from the network cloud. Vehicular cloud brings more research perspective in the data management aspect. The search for secure and robust routing protocol is again an area of research that demands the best routing protocols which can provide better latency, end to end delivery ratio as well as security to the data transmission messages. Mobility model also provides scope of research as it brings out the macroscopic and microscopic point of view about road topology, to bring the sense of realism in it.

Conclusion

In this paper, the survey has been carried about the fundamentals of the vehicular networks. This paper tries to give the brief review about vanet as the component of the ITS. It reflects the use of secure routing protocols that is the major security issue in the Vanets. The paper briefly highlights the transportation issues that can be resolved by the application of Vehicular networks. Paper gives a review about the mobility model, network simulators and vanet simulators. At the end current challenges & future scope has been discussed that reflects the more research possibilities in near future.

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Innovative Product Development Process under Governmental Collaboration in Non-Food Herbal Product Industry: Conceptual Framework.

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Abstract

At present, the product innovation is becoming competitive in terms of business advantage as companies attempted to develop and launch innovative products in the market to attract market share and maintain their profitability. Toward innovative product development, there are several circumstances worth a concern that affect the company's success in relation to product ideation, concept feasibility, product development, including testing, launching the product and commercialization. Government support process is a crucial factor which serves as a facilitating platform to accelerate its successful rates of product development. However, at present, government support process is still an intricacy that may be caused by lack of efficient collaboration and flow throughout the process. This paper proposes a conceptual framework of an innovative product development process which acts as a platform in an attempt to accelerate successful innovative products of Thai communities under collaboration with a government campaign for non-food herbal, known in Thai as One Tambon One Product (OTOP).

Keywords

New Product Development Process, Government Support Policy, Government Collaboration, Community Enterprise

Introduction

Currently, Thailand's herb is being considered fully potential as it is a major manufacturing source. Various types of herb are beneficial, especially when it was used as a raw material to produce various products, such as medicine, cosmetics, health supplements, which correspond to current trends and increasing demand of using herbs to replace synthetic chemical substances. Moreover, industrial expansion requires herbal products. For instance, use of medication and supplements for alternative medicine or essential oil and herbal compress balls in spa business, natural & organic cosmetics and

Thai herbal has affected the demand for medical plants in the country. The original market value of 16,292 million baht in B.E. 2552 (2009) is expected to increase to 32,701 million baht by the end of B.E. 2558 (2015) or average growth of no less than 12.3% per year. In addition, the National Plan for Herbal Development Vol. 1 of B.E. 2560-2564 demands that Thailand has to be the leading exporter of raw materials and herbal products in Asia while doubling at least the value of raw materials and herbal products in the country (Promotion, 2016).

At present, the government is giving priority to development of traditional Thai medicine and herbs by

enacting a national plan regarding the development of Thai herbs Vol. 1 of B.E. 2560-2564,

Guidelines for promoting Thailand's herbal market consists of 4 aspects:

- 1) Promote herbal products with potential;
- 2) Develop the industry and herbal market to reach the global level;
- 3) Encourage use of herbs for medical treatment and health promotion; and
- 4) Develop government policy to integrate in the whole system from the beginning to the end through the government agencies responsible for promoting various business aspects.

The aspects include starting a business, industry and manufacture, knowledge and counseling agency, agency regarding products, processes, and standard development, sources of funding for product development, agencies that recommend import-export processes in order to enhance the competitiveness of the overall Thai herbal industry system ("National Master Plan on development of thai herbal vol. 1 of B.E.2560–2564," 2560). Such agencies are the Ministry of Interior, Ministry of Public Health, Ministry of Commerce, Ministry of Higher Education, Science Research and Innovation, Ministry of Tourism and Sports, Ministry of Education, Ministry of Agriculture and Cooperatives, Ministry of Natural Resources and Environment, Ministry of Industry, the Board of Trade of Thailand, National Research Council of Thailand and Health Systems Research Institute. Namely, the Ministry of Interior, Ministry of Public Health, Ministry of Commerce, Ministry of Science and Technology, Ministry of Tourism and Sports, Ministry of Education, Ministry of Agriculture and Cooperatives, Ministry of Natural Resources and Environment, Ministry of Industry, the Board of Trade of Thailand, as well as National Research Council of Thailand and Health Systems Research Institute.

Herbal industries of Thailand are mostly small and medium sizes (98 percent). Therefore, in order to increase the level of competitiveness of the entire Thai herbal industry system, coordination to promote use of scientific knowledge and technology, research and innovation, as well as, applying knowledge with creativity to add more product value and produce new products that are diverse and able to respond to changes and needs is

required. Governmental sectors, such as The National Board of Herbal Policy, National Council on Research and Innovation Policy, Office of the National Economic and Social Development Council have supported and implemented product development through various governmental agencies such as, universities and the Ministry of Higher Education, Science Research and Innovation.

A process of knowledge exchange was done from universities to communities as well as integration of work with communities, a process of collecting studies on local knowledge, support establishment of a research center that meets the standard with effective analytical tools, test of the quality and properties of herbal extracts and herbal products, development of new products' features to make them easier to obtain data from research results for further in-depth research, a standardized laboratory, and establishment of cosmetics and natural and organic products' testing center(council, 2560; "National Master Plan on development of thai herbal vol. 1 of B.E.2560–2564," 2560).

Among many potential new product development processes to create a new commercially successful product , some of the process are general. Therefore, the new product development process for OTOP should be concentrated to cooperate with government support, especially for community enterprise which produce Thai OTOP products, is necessary. Moreover, government policies that support privatization to upgrade Thai herbal products and the process of developing them are commercially viable along with regulations that are conducive to commercialization.

This research objective is to explore the new product development process with government collaboration for non-food Thai herbal product communities with attempt to accelerate innovative product success specially for Thai community enterprises.

New Product Development Process

The general process of new product development has been explored by many authors. For instance, Kotler claimed that the process consisted of idea generation, idea screening, concept development, marketing strategy, business analysis, product development and test of marketing and commercialization. This process is general in marketing strategies for product development (Philip Kotler, 2006). Cooper presented the process including

Idea Generation, Idea Screening, Concept Testing, Business and Market Analysis, Product Development, Market Testing and Commercialization (Cooper, 1990). In addition, extremely competitive businesses are trying to decrease the process of launching goods rapidly so the process including ideation, concept feasibility, product development, testing and launch product (Cooper, 2008). In terms of the product development process based on the theory of (Crawford & Di Benedetto, 2003), the new product development process is divided into 5 steps: explore opportunities and select innovations, create concepts, evaluate the concepts, product development, and commercialization. Moreover, Prima (2010) proposed new product development in two stages. The first one, called Product Planning (Front-end), includes five steps: opportunity identification, idea generation, idea screening, concept testing and development and business analysis. The second stage, called Product Development (Back-end), concerns product launch to the market. It consists of product testing and development, testing market and commercialization (Ayudhya, 2010).

In terms of the product development concept related to cosmetics from fruit or herb, Cernasov proposed the concept into developing a new cosmetic product related to anti-aging (Cernasov, 2008), which is conducted by 4 steps along with integrating the regulations of cosmetic products manufacturing as part of the development process. This include the process of searching the market demands of the product (Market Analysis) by obtaining data of both local and international market conditions, the consumers' need, competitors' information, and product trends, to determine the needs and demand of the market. The product development process (R&D process), has devised an extract, finding raw materials to be use as a guide in the product development to produce a product that is new and meets the market demand. The manufacturing process features a safety test, request a standard in order to indicate efficiency of the product to be used as a data to conduct a market plan, as well as manufacturing process operates in accordance with the formula. Such includes the processes of introducing new products to the market (Product launch), the development of packaging, marketing, and bringing products into the market.

In Thailand, new product development was previously adopted from Kotler's and Cooper's model with extension to the process of safety testing standard test/claim

substantiation in Thai's law context, but this process is used for cosmetic and supplement products (Leevutinun, 2014) by adding more processes from the concept of Cernasov (2008). This concept is to generate ideas about new products, evaluation and selection of ideas, market and business analysis, product development, development of product's prototype, saftety testing/standardize product test, market testing, and operating a commercial business.

New product development is a significant strategy and many companies use efforts and resources in order to successfully achieve a new product development process. Some studies of successful new product development depend on requirement of technological knowledge and ability to transform it into valuable new products, complementary assets to facilitate the manufacturing, marketing, sales, and distribution of those products (Robert & Elko, 2007). Markham and Griffin talked about a new product development strategy, researcher and team, top management of the company support, full budget and resources to develop new products (Markham & Griffin, 1998). Moreover, government support in product development, marketing, finance, affiliate network in business relating to small enterprises in herb and spa product are important factors (Kongrer, 2013).

Based on review of variables such as entrepreneurship, product potential, Market potential, Technological, Manufacturing, Marketing, sales, and distribution, researcher and team; etc are the component to increase new product development process successful.

The characteristics of people for entrepreneurs require the process of achievement such as need for accomplishment, need for independence, stability and learning, creativity, risk-taking and location of control (Miller, 1983). Furthermore, innovativeness and enthusiasm were the characteristics of good entrepreneurs (McClelland, 1987).

Product potential and Market potential are the tool for evaluate the product position, Kenichi Ohmae introduced 3C's Model concept by the strategy for business success called Strategic Triangle for internal company analysis. It highlights 3 factors: company analysis, customer analysis, and competitor analysis, which lead to organization competitiveness (Ohmae, 1983) in terms of external and internal SWOT Analysis (Armstrong.M,1996) used for business analysis, customer analysis by 4W (WHO, WHAT, WHERE, WHY) and competitor analysis by the 5Forces model.

Technology Assessment which is able to be transformed into valuable new products (Rip, 2018) is considered in set the analysis of continuous changes in technology development and the impact of technology changes affecting society, Identification of various technological development's potential consequences and Analytical management from knowledgeable experts relevant to technology circles.

Researchers is one of the important factors to develop product or generate new product should possess the following characteristics (Stefanadis, 2006):

- Open mind and ability to adapt themselves to a critical way of thinking;
- Hard working, diligence, being focused and devotion to specific field of interest; and
- Updated knowledge for enhancing idea to exchange with colleagues working in relevant field.

Commercialization is a process by which the government tries to promote and support the network working together to persuade customers to accept and buy the product. Marketing strategies are those that enable customers' product understanding and recognition of valuable products (Kotler, 2004). Current green market strategies focus on the importance of customers and marketing interactions to preserve and encourage outstanding

interactions with customers that deliver value to customers will serve as a measure of long-term company achievement and customer satisfaction (Ozturkoglu, 2016). Marketing for two-way communication under 4C's marketing strategies conducts research and understands clients Business products and services in order to provide 4C including, 1.) Consumer wants and needs for distribution channel, which is appropriate for customers, 2.) Cost of the price which are not just for profit but will include the time various feelings of consumers to buy, 3.) Communication which focus on communication together with facilitate to customer for easy to buy, convenient to access and create the right awareness of product for the customer, 4.) Convenience which this may mean Access to customers by using the internet channel (Schultz, Tannenbaum, & Lauterborn, 1994)

Regarding literature review, new product development process can be summarized and compared according to the process illustrated in Table 1. In this research, new product development process will compose of opportunity identification, idea generation, idea screening, concept testing, business and marketing analysis, product development, prototype development, safety testing/standard test/claim substantiation, product testing and development, testing market and commercialization.

Table 1 - Comparison of New Product Development Process

New Product Development Process	Author							
	Kotler, 2006	Cooper, 1994	Cooper, 2001	Crawford and Di Benedetto, 2003	Ayudhya,2010	Cernsov, 2008	Leevutinun, 2014	Researcher's NPD
Opportunity Identification					•			•
Idea generation	•	•	•	•	•		•	•
Idea Screening	•	•	•	•	•		•	•
Concept testing	•	•			•			•
Business/Marketing Analysis	•	•		•	•	•	•	•
Product development	•	•	•	•		•	•	•
Prototype development						•	•	•
Safety testing standard test/claim substantiation						•	•	•
Product testing and development	•				•			•
Testing market	•	•	•		•		•	•
Commercialize	•	•	•	•	•		•	•

Government Support Policy

Small enterprise or community enterprise are the organization need supported, in Japan, government support for small industrial groups that develop OVOP products in Oita province has been used to implement and develop the factors following 3 parts: 1) Local Yet Global, 2) Self-Reliance and Creativity; and 3) Human Resource Development (Igusa, 2006). The government helped assist small businesses and communities so that they could survive and compete with others. This was done by studying the success factors of governmental support, such as Japan, Republic of Kyrgyzstan, Guam, Indonesia Thailand or even Philippines. The local government tried to encourage and support in terms of small enterprise business activities, In Japan they are supported, such as research and development products, by using local creativity, creating local brands, setting up competitive events to seek the best product and training in business subjects (Kurokawa, Tembo, & te Velde, 2010). In addition, in Republic of Kyrgyzstan Government encourages local leaders to engage in all government collaboration, exhibition and roadshow events and financial support (Igusa, 2006). In Guam, there were facilitated to build employment opportunities in community by enhance labors abilities in order to revive the economy (Li & Schumann, 2013). Indonesia has been training in machinery and tolls to enhance product advantage, marketing activities, laws and finance (Sari, 2016). Malaysia assists communities in product and service pricing, search for market possibilities, government technical advisors in product development and business (Aman, Tahir, Majid, Aziz, & Rahmiati, 2011). Thailand, there were provided training in business related marketing, sales and business perspective for communities, support the establishment of factories and product scale up (Denpaiboon & Amatasawatdee, 2012). In Philippines, there were supported in knowledge to enhance their abilities, product roadshow in local and global, marketing, funding, laws; and establishment of production plants (Rana, 2008)

Furthermore, in Malaysia, a study of the successful factors of the small rural entrepreneurs under the ODOI program (the One-District-One-Industry Program) was carried out. The important role of the government in promoting successful small businesses relies on the fact that the

government should assist and provide an environment conducive to small enterprises in rural areas. Also, the government should play a vital role in 1) training workers with industrial skills and creativity 2) strengthening business with a stricter set of business training 3) providing investment in infrastructures and facilities in order to create a favorable local business environment and 4) providing support services for the effective market regarding the promotion of products, market access and

network (Kader, Mohamad, & Ibrahim, 2009).

The advantages of effective collaborative governance can help policy makers identify and target problems, deliver action more effectively, enable a better, shared understanding of complex problems involving many stakeholders and allow these stakeholders to work together and agree on solutions (Ansell, Gash, & theory, 2008) there were six important components:

- 1) the forum initiated by public agencies or institutions,
- 2) participants in the forum as well as nonstate actors,
- 3) participants attractive directly in decision making and not only “consulted” by public agencies,
- 4) the forum formally organized and meeting collectively,
- 5) the forum aiming to make decisions by consensus, and
- 6) the focus of collaboration on public policy or public management.

The government-supporting policies are important for enterprise in Thailand. Focused on product development, there are various entities like The Ministry of Higher Education, Science and Innovation, which has mission to transfer technology. There are missions to enhance the capability of small enterprise, the policy of collaboration between government and entrepreneur, such as research and develop product, process, develop packaging, testing product to meet legal product standard, consultants and commercialization. Moreover, offices to university-industry collaborations as technology transfer offices, university incubators and, collaborative research centers are available to provide consultation for small enterprises to develop OTOP product (*OTOP Upgrade project*, 2561).

However, almost half of the attempt that companies are spent on new product development may fail. This evidence is particularly highlighted in the pharmaceutical and herbal industry mainly because of long development time, low success rate, high capital requirement, and market uncertainty (Yousefi, Mehralian, Rasekh, & Yousefi, 2017). Small enterprises in Thailand, known locally as One Tambon One Product(OTOP), plays an important role to drive herbal product to market because they have local wisdom, formula, raw materials and have been familiar with production for a long time. However, the problems of OTOP is lack of budget, manufacturing capacity, knowledge to upgrade product to global market and marketing, etc.

According to the literature review and interviews with entrepreneurs, it was found that the practitioner in the community enterprise still needed to develop the product using the consumer’s opinion in order to develop the product with effectiveness, with standards, and ability to attract product purchase. The governmental sectors still

require collaboration (Government Collaborative) by integration, as well as, providing consultation on the entire product development system (Integrated Consultant) and forwarding the demand to concerned authorities (Problem Matching).

The model will apply process in the future which considers theories in the process of new product development, concept and integration with government agency policies in order to increase the efficiency of each product development process and shorten time to process each process until results in the operator enjoy effective satisfaction and increase sale volume and cost.

The conceptual framework is divided into 3 parts: part 1 New Product Development process, part 2 Government support and collaboration and part 3 new product success process evaluation.

Part 1: New Product Development Process

Stage 1 Idea Generation and Idea Screening. Government does evaluation and training.

Including

- Entrepreneur Potential
- Product Potential
- Market Potential

Stage 2 Product development, government and entrepreneur collaboration are involved.

Including

- Technology assessment
- Researcher readiness
- Product development process
- Safety Testing, Standard test, Claim

Substantiation

- Product Testing
- Pilot scale

- Manufacturing
- Testing Market

Stage 3 Commercialization, government and entrepreneur collaboration is involved.

Including

- Matching
- Funding
- Consulting
- Training
- Marketing strategy

Part 2 Government support and collaboration

In each process, there will be a study of government support, which is a supporting agency for the OTOP product development process to make the product more effective by studying guidelines and forms that the government should provide support in each process of the new product development in order to produce an effective product.

Part 3 New product success process evaluation

While increasing the competitiveness, this process of the new product development will be used in developing new

products of small enterprise group, of which the level of performance can be measured in 2parts. The first is the financial aspect such as, the growth of product sales and the second the non-financial aspect, such as full-system recommended service, the speed, and satisfaction received from the service.

This conceptual framework of innovative product development processes which act as a platform to accelerate innovative product success of Thai community under the collaboration with government support for non-food herbal One Tambon One Product (OTOP) in Thailand is shown as Figure 1.

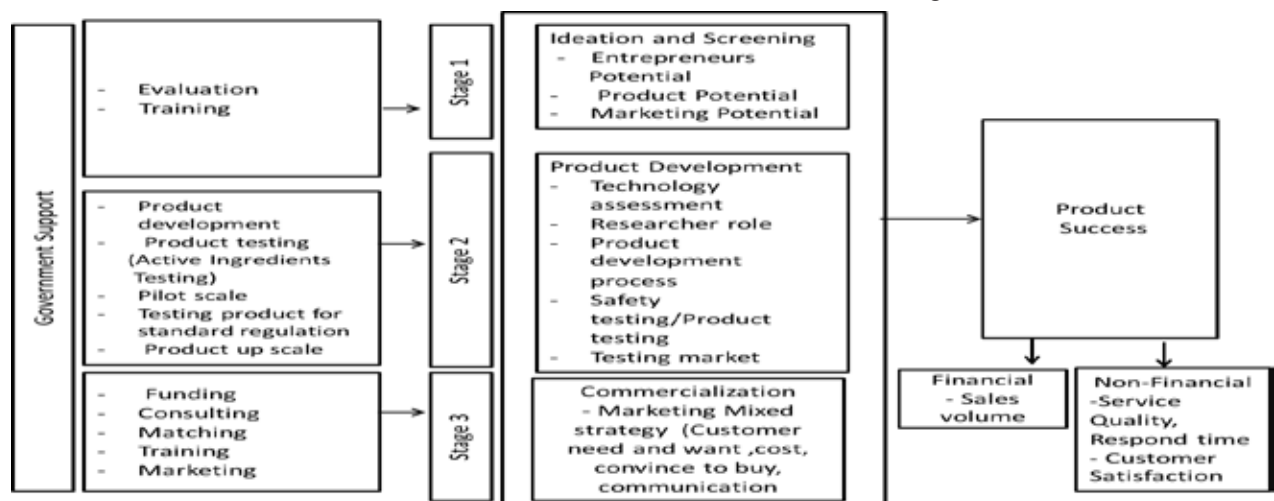


Figure 1 – Conceptual Framework

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A Study on the Sustained Use of Mobile Payment Services - Comparison of Alipay and Wechatpay in China

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Abstract

This study conducted an empirical study on factors affecting the continuous use of mobile payment for users. Based on Technology Acceptance Model (TAM) and Extended Expectation-Confirmation Model of IS Continuance (ECM-ISC), we set up the model and hypothesis by adding habit and utilization range as independent variables. We received 426 valid questionnaires from users who have used continuously mobile payments such as Alipay and Wechatpay in China. The collected data was analyzed by SPSS for validity, reliability, factor analysis, T-test and regression analysis. The result shows that perceived usefulness, perceived risk, habits and utilization range have positive effects on users who use AliPay. Users who use Wechatpay have been affected by perceived usefulness, perceived use of ease, habit and application scope. However, the social influence does not affect both.

Keywords

Mobile payment, continuous usage, Technology acceptance model, IS continuance.

1. Introduction

This The improvement of mobile communication environment and the spread of smart phone, mobile terminal applications are rapidly developing in relation to e-commerce in China. According to the 41st China Internet Network Development Status Statistics Report, published by China Internet Network Information Center, the number of Internet users in China was 772million by December 2017. The number was increased by 40.4million from the end of 2016, with an increase of 5.6%. Among them, the number of mobile users in China reaches 755 million, and the rate is 97.5%. Compared to December 2016, the percentage of Chinese Internet users using offline payments rose from 50.3% to 65.5%. After the rapid growth of user number, the mobile payment market in China has matured and the growth rate is gradually declining. According to the <2017 China Third-Party Mobile Payment Market Research Report> released by iiMedia Research on April 2018, the number of mobile payment users in China reached 562 billion yuan in 2017. This is an increase of more than 100 million people by the end of 2016 and the growth rate is 21.6%. In addition,

online payment transactions in China reached 207.5 billion yuan in 2017. Additionally, mobile payment in China reached about 203 billion yuan in 2017, this is up 28.8% from the end of 2016. Although mobile payment growth has declined in recent years, total online transactions have expanded steadily. Third-party mobile payment products would become popular, also mobile payment would be common as changing consumer's payment concepts.

In the first quarter of 2018, Alipay and Wechatpay (Tenpay) accounted for 90.6% of China's third-party mobile payment transaction market share. This shows that the mobile payment market is highly concentrated in both companies. Alipay and Wechatpay dominated the third-party mobile payment market, which has entered the maturity phase. The introduction of Wechatpay in market is much later than Alipay, but it has gained more user appeal because of its unique characteristics different from Alipay, and is also quickly chasing Alipay in its overall user size.

The purpose of this study is as follows. First, we examine the factors that affect the continuous use of users for

the sustainable users of Alipay and Wechatpay. Second, we determine the extent to which the factors affecting continuous use affect each application.

2. Theoretical background

2.1 Technology Acceptance Model (TAM)

User adoption of new technologies is a requirement for technological advancement, which is critical in research to uncover factors on how individuals embrace and understand new information technology. The Technology Acceptance Model (TAM) is the most common and representative model for explaining and predicting the factors that affect information technology users' behavior and acceptance of general information technology.

TAM was proposed on the theoretical basis in theory of reasoned action (TRA, Fishbein & Ajzen, 1975) theory of planned behavior (TPB, Ajzen, 1985) and social psychology (Fishbein, 1975). TAM consists of four main types: perceived usefulness, perceived ease of use, attitude, and behavior. Perceived usefulness and perceived ease of use, which are perceived as important related variables, are used to influence actual behaviors as a parameter of attitude and behavioral intention. The model explores the use of personal act and use behavior.

Oh and Kim (2006), based on TAM, found that the systematic quality of internet banking was confirmed to be perceived ease and usefulness and a positive influence relationship. Pousttchi, K et, al(2009) conducted a study on mobile payment service through using TAM, and perceived trust, confidentiality, usefulness, ease of use and task and technology fit influenced the acceptance of mobile payments. Dahlberg, Mallat et al. (2003) argued that safety had six dimensions, perceived risk of customer affected to use behavior. The level of risk was depending on the customer's age, especially, perceived anxiety in young people was lower than other ages.

Mallat & Rossi (2009) added three dimensions to TAM ; compatibility, portability and usability. Focusing on the scope of payment, they studied how tickets affect mobile payments. The scope of payment was found an important factor to user's intention to use and the user's intention to use was influenced by the efficiency of the purchase of the ticket and the features not limited by time and space. Kim & Lee (2001) investigated the acceptance of Internet mobile networks for Korean users using TAM. The results of this study confirmed that personal characteristics such

as age, academic background, and frequency of mobile phone usage, and social co-operation positively affect mobile business.

2.1 Continuous Use Model of Information System

To systematically understand the behavior of information technology users after their acceptance, Bhattacharjee (2001), proposed Expectation Confirmation Model of IS continuance (ECM-ISC) which was combined Expectation - Confirmation Model (ECM) of customer behavior theory argued by Oliver (1980) and the Technology Acceptance Model of Information System. Confidence, perceived usefulness, satisfaction, and persistent use of information systems were introduced to explain persistent use after acceptance by Expectation Confirmation Model and TAM. In addition, the study used perceived usefulness and satisfaction as mediate variables for finding an effect between the expectation of IS and the intention to use the IS.

TAM has meaningful to study the initial acceptance, but there are limits to be understood the intention to use the IS in a long-term perspective. However, ECM-ISC model was intended to focus on the intention to use the IS. ECM-ISC, which is based on the TAM, could complement the limitations of the TAM by providing a rational explanation for the interruption after the acceptance. It could be interpreted more variously and accurately, because it is able to explain the case of not using the IS after employing the IS.

Much research of studying about the IS of the intention to use has focused on the user's persistent intent to use rather than the ongoing use of the user. The ultimate success of the IS means that measures the continuous usage behavior of the product or service, but the persistent intention has difficulty to directly reflect the continuous usage behavior. The final goal of studying user persistence intention is to study user behavior, so that Limayem (2007) conducted the study by extending the dependent variable of the ECM-ISC model from the persistent intention to the continuous usage behavior. Bhattacharjee (2001) extended the ECM-ISC model of the literature information system, and using the Perceived Behaviors Control (PBC), the study added IT self-efficacy and facilitation from the original model for completing the extended ECM-ISC model.

3. Research Model and Hypothesis

This study set up the research model from based on the

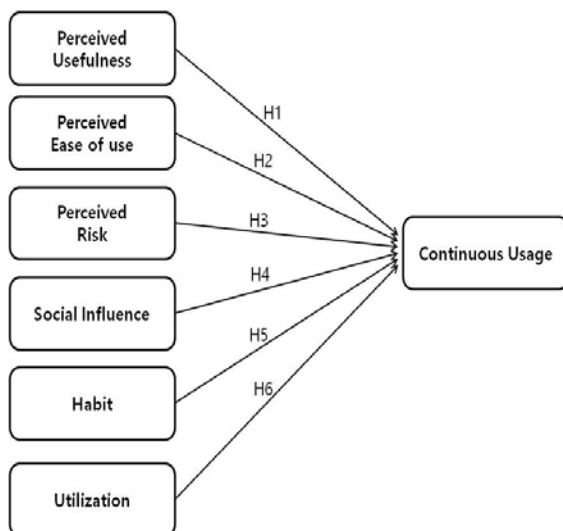
TAM and the Continuous Usage Model. In order for the purpose, this study tried to focus the continuous usage behavior rather than the persistent intention, and many important factors revealed in previous research were used and unnecessary factors in this study were removed. Figure 1 is the research model subjoined new factors in the study and hypothesis set up based on the model (Table 1).

In order to measure how mobile payment users were perceived about Alipay and WeChatpay, and which variables are influential on mobile payment continual usage, we use perceived usefulness, perception ease of use, perceived risk, social influence, habit, and utilization. The measured variables were examined using the Likert 5-point scale and the operational definition and measurement items of the variables are shown in Table 2.

<Table 1> Hypothesis

H1	Perceived usefulness is associated positively to the continuous usage.
H2	Perceived ease of use is associated positively to the continuous usage.
H3	Perceived risk is associated negatively to the continuous usage.
H4	Social influence is associated positively to the continuous usage.
H5	Habit is associated positively to the continuous usage.
H6	Utilization is associated positively to the continuous usage.

<Figure 1> Research Model



<Table 2> Measurement method of used variables

Variables	Questions summary		The quarry of question
Perceived usefulness	PU1	By using the mobile payments, I can make a variety of transactions faster.	Venkatesh, Davis(2003)
	PU2	By using the mobile payments, I can eliminate the inconvenience of carrying cash or credit cards.	
	PU3	Using the mobile payments is very useful in my life.	
	PU4	I am not difficult to learn the mobile payment methods.	
Perceived ease of use	PE1	The response velocity of the mobile payment system is very fast.	Venkatesh, Davis(2003)
	PE2	The interface of the mobile payment system is easy to use and simple.	
Perceived risk	PR1	Transaction through the mobile payment will be low risk of personal information leakage.	Bauer (1960)
	PR2	Transaction through the mobile payment will have a low risk of transaction information leakage.	
	PR3	Transactions through the mobile payments will have a low risk of cross-transaction errors.	
Social influence	SI1	The use of the mobile payments by nearby people has impacted my mobile payment usage.	Venkatesh (2003), Anderson (2004)
	SI2	People near me have influenced my mobile payment usage.	
	SI3	Mass media (TV, newspapers, radio, movies, etc.) affected my mobile payment usage.	
Habit	HA1	Unconsciously I use the mobile payment when making a payment.	
	HA2	The mobile payment is already part of my daily life and is indispensable.	
Utilization	SC1	The mobile payments can be used in a variety of places.	Mallat (2007)
	SC2	The range of the mobile payment services is very broad.	
Continuous usage	CU1	I want to recommend the mobile payments to people around me.	Bhattacharjee (2001)
	CU2	I will continue to use the mobile payments in the future.	
	CU3	I will be using more the mobile payments in the future than using other payment methods (cash, cards, etc.).	

4. Analysis of Research

4.1 Data collection and Characteristics of samples

In this study, the survey sample was limited to Chinese who live in China and use Alipay and WeChatpay. The questionnaire items in this study were randomly distributed into two parts, A and B. The questionnaires were made from the online questionnaire site and distributed through SNS and messengers. A total of 472 samples was collected and 48 samples were removed due to unreliable response. 426 samples were valid data for the study. Finally, 407 samples which were able to use Alipay and WeChatpay both were analyzed. The samples were divided into 4 groups of A, B, C, and D as shown in Table 3.

To investigate the characteristics of the respondents and the continuous use of payment applications, questions were asked about demographic survey items, such as gender, age, occupation, residence, monthly average disposable income, duration time, and average number of use per month.

The results of the demographic distribution of the survey were shown in <Table 4> <Table 5>.

<Table 3> Group of the samples

Respondent	Using Alipay	Not using Alipay
Using WeChatpay	Group A, 391 samples (91.78%)	Group B, 16 samples (3.76%)
Not using WeChatpay	Group C, 16 samples (3.76%)	Group D, 3 samples (0.7%)

<Table 4> Continued use of Alipay and WeChatpay

Classification	Response categories	Frequency		Rate	
		Alipay	WeChatpay	Alipay	WeChatpay
Usage Time	Not use	19	19	4.46%	4.46%
	Less than 1 year	19	26	4.46%	6.1%
	1~2 years	76	102	17.84%	23.5%
	2~3 years	126	140	29.58%	32.86%
	Over 3 years	186	139	43.66%	32.63%
Average usage monthly	Not use	19	19	4.46%	4.46%
	1~5 times	42	61	9.86%	14.32%
	5~10 times	70	102	16.43%	23.94%
	10~15 times	115	111	27%	26.06%
	Over 15 times	180	133	42.25%	31.22%

<Table 5> Demographic characteristics of respondents

Classification	Response categories	Frequency	Rate
Gender	Male	158	37.09%
	Female	268	62.91%
Age	Under 20 age	24	5.63%
	20~30 age	260	61.03%
	30~40 age	93	21.83%
	40~50 age	27	6.34%
	Over 50 age	22	5.16%
Academic background	Under a high school graduate	22	5.16%
	College graduation	75	17.61%
	University graduation	262	61.5%
	Graduate school	67	15.73%
Occupation	Student	152	35.68%
	Office worker	152	35.68%
	Self-employed	58	13.62%
	Government employee	38	8.92%
	Others	26	6.1%
Residence	Beijing	130	30.52%
	Chang Jiang	104	24.41%
	Zhu Jiang	62	14.55%
	Others	130	30.52%
Monthly average disposable income	Less than 1000 yuan	42	9.86%
	1000 ~ 3000 yuan	124	29.11%
	3000 ~ 5000 yuan	137	32.16%
	5000 ~ 8000 yuan	89	20.89%
	Over 8000 yuan	34	7.98%

4.2 Validity and reliability analysis

Factor analysis was conducted to verify whether the items and concepts of the research model set prior to this analysis were well reflected. In addition, the reliability and validity analysis were performed. As a result, the KMO value was 0.874 as shown in <Table 6>. As a result of factor analysis of 19 detailed items, it was divided into 7 factors as shown in <Table 6>. The results of the reliability analysis (Cronbach's alpha) are shown in Table 7.

<Table 6> Validity and reliability analysis

Factors		Factor results						
		1	2	3	4	5	6	7
Perceived usefulness	PU1		.748					
	PU2		.635					
	PU3		.676					
	PU4		.694					
Perceived ease of use	PE1							.819
	PE2							.690
Perceived risk	PR1			.819				
	PR2			.802				
	PR3			.742				
Social influence	SI1				.828			
	SI2				.822			
	SI3				.770			
Habit	HA1						.624	
	HA2						.764	
Utilization	SC1					.813		
	SC2					.743		
Continuous usage	CU1	.627						
	CU2	.599						
	CU3	.681						
Kaiser-Mayer-Olkin					.874			
Bartlett's test	Chi-squared				4262.607			
	Degree of freedom				171			
	Significance				.000			

<Table 7> Cronbach's alpha results

Factors	Items	Cronbach's alpha
Perceived usefulness	4	0.720
Perceived ease of use	2	0.529
Perceived risk	3	0.738
Social influence	3	0.751
Habit	2	0.653
Utilization	2	0.527
Continuous usage	3	0.718

4.3 Correlation analysis

Prior to regression analysis, correlation analysis was performed to determine the relationship between independent variables. Table 8-1 summarized the results of the correlation analysis between the measurement variables of Alipay. The correlation between the measurement variables of Alipay showed that the results of significance were less than 0.01, except for the social effects, and the perceived usefulness and continuous usage showed a high correlation with 0.579, and the correlation coefficient of social influence was a low correlation with other factors.

Table 8-2 summarized the results of the correlation analysis between the measurement variables of WeChatpay. The correlation between the measurement variables showed a significant level of less than 0.01, except for the social effects. The habit and continuous use showed a high correlation with 0.614, and the correlation coefficient of social influence was mostly low.

<Table 8-1> Coefficient of Correlation in Alipay

Alipay	PU	PE	PR	SI	HA	SC	CU
PU	1						
PE	.420**	1					
PR	.137**	.336**	1				
SI	.096	.027	.226**	1			
HA	.494**	.298**	.258**	.108*	1		
SC	.442**	.291**	.148**	.133**	.456**	1	
CU	.509**	.363**	.328**	.148**	.579**	.488**	1

<Table 8-2> Coefficient of Correlation in WeChatpay

WeChatpay	PU	PE	PR	SI	HA	SC	CU
PU	1						
PE	.460**	1					
PR	.093	.275**	1				
SI	.055	.111*	.234**	1			
HA	.418**	.379**	.239**	.221**	1		
SC	.397**	.268**	.163**	.064**	.402**	1	
CU	.432**	.448**	.339**	.188**	.614**	.456**	1

4.4 T-test

T test is an analytical method that can verify the significance of two sample differences. As shown in Table 9, t value of the perceived usefulness and continuous use were significant, 2.705 and 3.238. The absolute value of the t value of the other measurement variables was less than 2 and not significant. In addition, all measured variables of Alipay except perceived ease of use were slightly higher than the Wechatpay average.

<Table 9> Result of T-test

Group	Alipay		WeChatpay		T-test results		
Factors	Means	Standard deviation	Means	Standard deviation	T value	Freedom of degree	Significance
Perceived usefulness	4.4957	.47227	4.4048	.48658	2.705	812	.007
Perceived ease of use	4.1757	.62617	4.2322	.61450	-1.299	812	.194
Perceived risk	3.6773	.79554	3.5938	.80256	1.491	812	.136
Social influence	3.5774	.91628	3.4783	.88595	1.569	812	.117
Habit	4.2285	.64470	4.1536	.72117	1.563	812	.118
Utilization	4.3575	.57393	4.2973	.59041	1.475	812	.141
Continuous usage	4.3505	.53245	4.2203	.61214	3.238	812	.001

4.5 Regression Analysis

In this study, multiple regression analysis was conducted to derive the factors affecting the continuous usage of mobile payment. For the purpose of this research, multiple regression analysis was performed by setting the perceived usefulness, perceived ease, perceived risk, social influence, habit, and utilization range as independent variables and continuous use as dependent variables. The collected data were analyzed by multiple regression by Alipay and WeChatpay. <Table 10> and <Table 11> are the results of multiple regression analysis.

<Table 10> Result of regression in Alipay

Model		Non-Standardized Coefficient		Standardized Coefficient	t	Significance	VIF
		B	SE	B			
1	Constant	.669	.215		3.118	.002	
	ALIPU	.235	.052	.209	4.553	.000	1.587
	ALIPE	.057	.036	.067	1.572	.117	1.371
	ALIPR	.105	.027	.157	3.897	.000	1.233
	ALISI	.017	.022	.030	0.783	.434	1.076
	ALIHA	.264	.037	.320	7.138	.000	1.520
	ALISC	.188	.040	.203	4.720	.000	1.394
R		R square		Adjusted R square		SE of estimate	
.686		.471		.463		.39026	

<Table 11> Result of regression in WeChatpay

Model		Non-Standardized Coefficient		Standardized Coefficient	t	Significance	VIF
		B	SE	B			
1	Constant	.263	.236		1.114	.266	
	WECPU	.135	.054	.108	2.488	.013	1.498
	WECPE	.152	.042	.153	3.640	.000	1.412
	WECPR	.119	.029	.156	4.096	.000	1.163
	WECSI	.020	.026	.030	0.799	.425	1.094
	WECHA	.333	.036	.392	9.193	.000	1.454
	WECSC	.194	.042	.187	4.639	.000	1.300
R		R square		Adjusted R square		SE of estimate	
.707		.500		.492		.43627	

5. Result

The regression results for the factors affecting the sustainable use of Alipay and WeChatpay are as follows. The perceived usefulness, habits, and utilization were found to have a significant effect on both Alipay and WeChatpay. However, social effects were not significant in both groups. Perceived risk affected Alipay's continued use, but did not affect WeChatpay. On the other hand, perceived ease of use affected the continuous use of WeChatpay, but did not affect the continuous use of Alipay. The results of hypothesis test are shown in <Table 12>.

<Table 12> Results of hypothesis

	Hypothesis	Results	
		Alipay	WeChatpay
H1	Perceived usefulness is associated positively to the continuous usage.	Accepted	Accepted
H2	Perceived ease of use is associated positively to the continuous usage.	Rejected	Accepted
H3	Perceived risk is associated negatively to the continuous usage.	Accepted	Accepted
H4	Social influence is associated positively to the continuous usage.	Rejected	Rejected
H5	Habit is associated positively to the continuous usage.	Accepted	Accepted
H6	Utilization is associated positively to the continuous usage.	Accepted	Accepted

6. Conclusion and Discussion

This study investigated the continuous use of mobile payment by combining the technology acceptance model (TAM) based on the technology acceptance domain and extended information system continuous usage model (extended ECM-ISC) based on the continuous usage domain. Specifically, we conducted T-test and regression analysis of Alipay and WeChatpay, representative mobile payment applications in China, to investigate what factors influence sustainable use. The analysis results of this study confirmed that perceived usefulness, perceived risk, habit and range of use affect the continuous usage behavior of Alipay and WeChatpay users. The perceived ease of use affects the continuous usage behavior of WeChatpay users, but does not affect to Alipay users. The social influence has been verified to have no impact on continuous usage behavior in both applications.

The conclusion of the study is as follows. First, in the case of perceived usefulness, both Alipay and WeChatpay showed significant results. This can be interpreted as the possibility of sustained growth in the future because of the market environment in China, which favored a payment method using mobile rather than cash. Second, in the case of perceived ease, only WeChatpay showed significant results. This is a result of the advantage that users can access easily based on online chat. Alipay, which needs to expand its market, is expected to need a reference to the benefits of this WeChatpay. Third, the social influence was not significant to both. This is speculated, because consumers choose their own method rather than selecting a payment method by the people around them. In this context, the habit, which is the fifth hypothesis, showed significant value, which means that consumer's habit had a greater effect on the choice of the payment method than the influence of the surroundings. Therefore, it is expected that the two companies will need to access through analysis of consumers' habits and life patterns in order to expand the market and obtain new consumers. Finally, the utilization also had a significant impact on both. WeChatpay, which focuses on online, and Alipay, which focuses on off-line, both showed significant results, this is meant that utilization beyond offline and offline is important. In other words, this is predicted that as the utilization of the existing payment method is widened, the company is possible to increase the number of customers and the customer loyalty by forming a new life pattern of consumers

The limitations of this study and future research are as follows. This study selected various variables revealed previous research that is expected to affect the continuous use of mobile payment. However, it is expected that there will be various factors affecting the continuous use of mobile payment. Therefore, detailed study of various variables will be needed. There is also a limitation of the sample collected for this study. A total of 426 valid samples were obtained, but there is a limit that the sample range is concentrated in age, occupation, and a living area (the twenties, students and large cities). The limitation of this sample is influenced by the research, so it is expected that future studies will be needed to collect various samples for generalization. Finally, future studies will focus on two companies. In the case of WeChatpay and Alipay, we introduced the mobile payment system in different situations of the company, and this reason

is thought to affect the consumers' satisfaction and continuous use. Therefore, detailed research on the background, environment and consumer perception of these companies is expected.

Reference

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The Influence of Learning Styles on a Model of IoT-based Inclusive Education and Its Architecture

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Abstract

The Internet of Things (IoT) is a new paradigm that is revolutionizing computing. It is intended that all objects around us will be connected to the network, providing “anytime, anywhere” access to information. This study introduces IoT with Kolb’s learning style in order to enhance the learning experience especially for inclusive education for primary and secondary schools where delivery of knowledge is not limited to physical, cognitive disabilities, human diversity with respect to ability, language, culture, gender, age and of other forms of human differences. The article also emphasizes the role of learning style as a discovery process that incorporates the characteristics of problem solving and learning. Kolb’s Learning Style was chosen as it is widely used in research and in practical information systems applications. A consistent pattern of finding emerges by using a combination of Kolb’s learning style and internet of things where specific individual differences, learning approach differences and IoT application differences are taken as a main research framework. Further several suggestions were made by using this combination to IoT architecture and smart environment of internet of things. Based on these suggestions, future research directions are proposed.

Keywords

Internet of Things, Learning Styles, Kolb, Inclusive Education.

Introduction

The 21st century students build confidence in managing their own learning, learn by doing connecting the classroom to the larger world, thrive in positive school cultures where they are engaged and motivated to excel, develop an understanding of global challenges and a commitment to act as responsible citizens. Learning demands new pedagogical and technological approaches to using technology (Mcrae, Ellis, & Kent, 2018). It is the responsibility of all educators to prepare students for the demands of an ever-changing world, through facilitating learning in a technology-rich environment, where students and teachers don’t just learn about technology, they use it to achieve powerful teaching and learning by improving student learning expectations.

Nowadays students use mostly Google applications as a main educational resource, they create accounts and

are introduced to Google Drive, Google Classroom, and other Google services. Along with Google Drive, students improve their tech skills by learning how to create animations, presentations, podcasts and narrations that show what they have learned and researched. They also use many browser-based learning environments to experiment and develop projects for their Units of Inquiry. Students are able to undertake deep research on the web using big data and are able to shift through that data to design and present very in-depth projects. They learn how to design websites, student portfolios and learn basic programming. They learn how to manage their time on and offline while using technology.

Technology should meet all environmental, social justice, and academic goals. Nowadays each student must know how to work with smartphones, tablets and laptops and utilize online instructional modules to become more

proficient at keyboarding and familiar with the devices and applications(Rytivaara, 2012).

Schools today focus on student-centered needs that enable them to employ technological resources to enhance and advance their educational experience (Maenpaa, Varjonen, Hellas, Tarkoma, & Mannisto, 2017). The goal of the educational technology program is to promote the ethical and responsible use and strengthen the teacher-student relationship by building higher-order thinking skills, as well as technology literacy skills, to maximize the uses of technology for authentic purposes. Educational Technology shall enhance achievement and will be incorporated in all disciplines. Usage of technology will help teachers implement a universal design for learning which aims to provide equal opportunities to learn. Technology will allow teachers to “present information and content in different ways” (what), “differentiate the ways that students can express what they know” (how), and “stimulate interest and motivation for learning” (why) (Hollier, Mcrae, Ellis, & Kent, 2017). This creates an active, engaged learning atmosphere in the classroom.

On our study we focus on the Internet of Things in inclusive education from Kolb’s learning theory perspective. Next section of the article presents the Internet of Things and the architecture of IoT. Further inclusive education with the internet of things is also discussed where we discuss IoT in smart environment from the student perspective, classroom perspective and campus perspective. Then the article describes the importance of learning theories and Kolb’s Learning Style, which is more practical in IoT applications and best describes the learning process in research and development teams. Finally, we combine and find commons in Kolb’s Learning Style with internet of things and suggest individual characteristics in IoT architecture according to Kolb’s Theory.

Internet of Things

The Internet of Things (IoT) is a new paradigm that is revolutionizing computing. It is intended that all objects around us will be connected to the network, providing “anytime, anywhere” access to information (Dutton, 2005). Although IoT brings significant advantages over traditional communicational technologies for ubiquitous learning, these implementations are still not much used. Therefore, this study introduces powerful possibilities opened by the IoT which are being included to education system in order to enhance the learning experience for primary and secondary schools.

The IoT has been gaining space, thanks to advances in telecommunications such as the expansion of broad bands, the new IP protocol version 6 and nanotechnology integrated into countless electronic devices, ranging from mobile devices, vehicles, appliances and more (Sheng, Mahapatra, Zhu, & Leung, 2015). The idea of the Internet of Objects is to integrate all these devices into the network, which can be managed from the web and in turn, provide information in real time and also allowing the interaction with people who use it. Education, as any human activity nowadays, has not been immune to this phenomenon dating the e-learning, m-learning.

The potential of ubiquitous learning is reflected in increasing access to learning content and collaborative learning environments supported by computers anytime, and anywhere (Verma & Sood, 2018). It also allows the right combination of virtual and physical spaces. The purpose of ubiquitous computing technology by using IoT is improving learning processes. It is trying to adapt learning resources to different contexts of use of learners. Being in this area where the internet of objects plays an important role in learning processes in formal and informal education. Increasing demand for education and fundamental changes in the technology landscape require new approaches to computer science education.

Traditionally, the teaching of embedded systems programming, sensor networks, and similar topics is deferred to higher-level courses, while introductory courses focus either on more fundamental topics or computing technologies that are “closer to home,” such as PCs and Web programming (Domingo, 2012). In contrast IoT based education focuses on current technologies and will be essential for the foreseeable future. Even though the concept is not well-defined, it is both possible and necessary to incorporate the IoT early on in education system because it orients students toward the future of computing and society.

Additionally, the physical computing aspects draw in students who, according to direct testimony from students and public discussions on forums such as Facebook or SNS, would never have considered a traditional computer science course. Even though there is tremendous excitement about online education, most course offerings are limited to subjects that can easily be taught online. For computer science, this means that courses focus on topics that can be studied with commodity technology, such as desktops and laptops. It is time to investigate large-scale

and scalable online teaching infrastructures for computer science education, ranging from cloud computing to the IoT. It is often difficult for individual universities to develop the infrastructure in-house.

Developing IoT based courses requires a multiyear effort by a large group of dedicated educators and a significant investment in people and technology. The IoT is seen as the next revolution in IT (Bagheri & Movahed, 2017). Emerging originally out of a learning context, the IoT is still primarily associated with the interests of large educators. However, unless we willfully expand the discussion and assign the needs, desires, and fears of ordinary learners as much importance as the requirements of educators, there is the danger that the IoT will fall short of its potential.

IoT Components

The Internet of things still has challenges that are inherent in its three layers as shown in Figure 1.

- First level: Hardware layer, that allows the interconnection of physical objects through sensors and related technologies. The challenges associated to this layer are related to miniaturization. Internal components should be smaller and more efficient, although today they are equipped with devices with processing, storage and connectivity capability. Capacities that might be expected to be increased in the near future.
- Second level: The network layer, which is currently with 4G networks. The great challenge is to connect billions of devices on a wireless network, being necessary the expansion of bandwidth and the electromagnetic spectrum. As telecommunications infrastructure is currently not suffice to support the inclusion of a large number of electronic devices, it is a challenge that has to be solved as soon as possible.
- Third level: Applications layer, which is plenty of opportunities to offer solutions to supply and provide information, from the physical to the virtual objects, as well as the interaction with people, making life easier and more efficient all the time.

RFID is a wireless technology that allows for automated remote identification of objects. An RFID system uses wireless radio communication technology to uniquely identify tagged objects or people. Today, RFID is applied widely in supply-chain tracking, retail stock management,

parking access control, library book tracking, marathon races, airline luggage tracking, electronic security keys, toll collection, theft prevention, and healthcare. The major components of an RFID system are tags or transponders has a unique identification number (ID) and memory that stores additional data such as manufacturer name, product type, and environmental factors including temperature, humidity, and so on, that are affixed to objects of interest and readers or interrogators that communicate remotely with the tags through wireless communication to enable identification (Chew, 2015).

The Wireless Sensor Networks comprise of relatively inexpensive sensor nodes capable of collecting, processing, storing and transferring information from one node to another that can be deployed on the ground, in the air, in vehicles, inside buildings, or even on human bodies. Sensor networks are the key to gathering the information needed by smart environments, whether in buildings, utilities, industrial, home, shipboard, transportation systems automation, or elsewhere. Sensor networks are employed in environment monitoring, biomedical observation, surveillance, security, and other applications (Sheng et al., 2015). Sensors in wireless sensor networks (WSNs) sense the environment and forward data to a sink. A sink node aggregates some or all the information that usually is far away from the data source. Sensor energy cannot provide long range communication to reach the sink due to the limited energy of sensor, hence multi-hop wireless connectivity is required to forward data to and from remote sinks. Each of the distributed sensor nodes has the capability to collect data, process them, and route them to sink node. Router nodes are deployed in sensor field to forward data from sensor nodes to remote sink node.

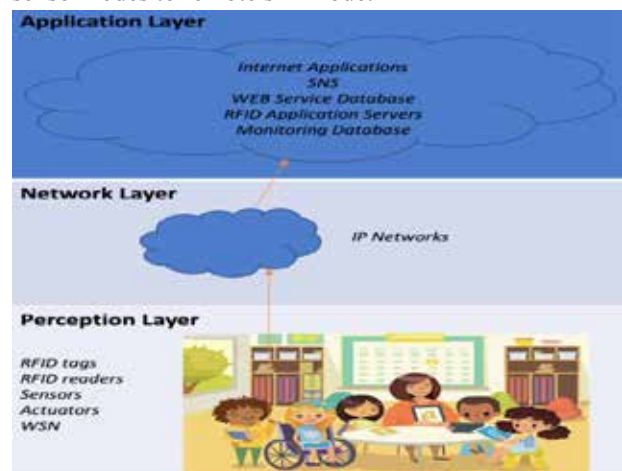


Figure1 – IoT Architecture

IoT - based inclusive learning

Inclusive education refers to the model where the schools' structure covers all children learning together in spite of their language, culture, gender, age, physical or cognitive disabilities and other forms of human differences (Ainscow, 2005). Inclusion rejects the notion of schools or classrooms for special children which separate students with disabilities from students without disabilities. For these reasons, the need for IoT based solutions will be incontestable. It is expected that smart objects will be dominant on the market in the next few years and will become ubiquitous in learning environment, which will impose the need for new and improved services for smart education system.

There are several IoT technologies as essential for building successful IoT solutions: radio frequency identification (RFID), wireless sensor networks (WSN), middleware, cloud computing and software for application development (Gubbi, Buyya, Marusic, & Palaniswami, 2013). They also identify three IoT categories for enterprise applications: monitoring and control, big data and business analytics, and information sharing and collaboration which are very necessary for inclusive learning. All data from different sources is accumulated in the cloud.

Environments can foster the participation and inclusion of disabled individuals in social, economic, political and cultural life. The IoT creates enabling environments by offering people with disabilities assistance in building access, transportation, information and communication. Sensory or mentally handicapped children can use interactive play and learning IoT environments to experience a richer learning experience, have more opportunities for language acquisition, become better at interacting with others and thus obtain higher self-esteem. In addition, these interactive IoT systems adapt to their learning rhythm. For instance, deaf children often need additional exposure to the American Sign Language because most of their parents are hearing and not fluent in this language. Now they can take this interactive IoT system with them from school to home and repeat the most difficult vocabulary until they understand and memorize it (Domingo, 2012).

IoT - based Smart Environment

To perform routine tasks there will be smart environment where all tasks are performed by smart devices is Mark

Weiser's idea (Weiser, 1991). Therefore, the main purpose of IoT-based technology is to provide easy access in everyday routine. If we talk about smart city for example, when we drive cars, we want to know about the road conditions, best route, traffic jams or want to change the radio stations, etc. By using sensors, actuators and smart devices, anyone can get any information only by his voice (Husnjak, Perakovic, & Jovovic, 2014). Creative environments must learn or understand how the environment works and thinks and must be able to react according to the action or situation. A smart environment can be expressed "as one that can acquire and apply knowledge about the environment and its inhabitants to improve their experience in that environment" (Youngblood, Heierman, Holder, & Cook, 2005).

Student Perspective IoT

We all know that it is not that easy to take attendance of each student and it is a time-consuming task. Use of IoT can save time and effort both by smart attendance system. A study proposed an efficient smart classroom roll caller system (SCRCS) using IoT architecture to collect or record student attendance after every period accurately and timely. RFID tags are attached to the Students' ID cards. The SCRCS can be installed in every classroom and read the students' identity card collectively. It shows not only the total attendance on LED display at the beginning of any class but also shows the all identity card on multiple slots of SCRCS. The record of a student's attendance is also kept at the academic office (Chang, 2011). Another study proposed a web-based attendance system using NFC technology in Android smart phones. The student taps the matric card towards the NFC Android Smartphone, and the attendance will be saved on the server automatically. Teachers and students both can check the presence from their smart phones (Alghamdi & Shetty, 2016). Real-Time Feedback on Lecture Quality: Students' understanding directly relates to the lecture quality. Students' feedback plays an essential role to improve lecture quality. A study proposes a creative environment that can monitor and observe students' reactions to a lecture using sensing and monitoring technology. This IoT-based smart device provides real-time feedback on lecture quality which will help to improve the lecture quality (Chew, 2015).

Smart Classroom Perspective IoT

Apart from student personal perspective of IoT, smart classrooms concept is very important. This concept

means an intellectual environment equipped with advanced learning aids based on latest technology or smart things (Gul et al., 2017). These smart things can be cameras, microphones and many other sensors, which can be used to measure student satisfaction regarding learning or many other related things. The smart object provides ease and comfort for class management. Use of IoT in a classroom may help to provide a better learning and teaching environment. Smart Classroom Management: The term "classroom management" means a way or approach a teacher uses to control his classroom. Smart devices have made it possible for a teacher to decide when he should speak louder when students are losing interest, or their concentration level is decreasing (Rytivaara, 2012). The use of IoT devices for teaching and learning purposes is a hot trend among institutions across the world which provides a new and innovative approach to education and classroom management. Such tools are already being utilized. Some of the commonly used IoT devices in the classroom are: Interactive Whiteboards, Tablets and Mobile devices, 3-D Printers, eBooks, Student ID Cards, Temperature Sensors, Security Cameras and Video, Room Temperature Sensors, Electric Lighting and Maintenance, Attendance Tracking Systems, Wireless door locks (Gul et al., 2017). Smart classrooms allow teachers to know what students want to learn and the way they want to learn which is beneficial both for faculty and students. Moreover, smart classrooms help students to understand the real purpose of using technology which also makes the learning process easier (Chang, 2011). The advancement in the field of technology in education has facilitated educators to design classrooms which are productive, useful, and collaborative and managed through IoT.

Smart Campus Perspective IoT

Nowadays almost all university campuses are connected to the Internet, and on each campus there are multiple objects like windows, doors, projectors, printers, classrooms, labs, parking, and building, etc. Using sensors, RFID, NFC, QR tags and such other IoT technologies, these objects can be converted to Smart objects (Ca??, 2015). A Smart Campus can be a collection of multiple smart things in a single system. An intelligent campus may include following: smart E-learning Application with IoT, IoT Sensors for Notes Sharing, IoT Sensors for Mobiles Devices,

IoT-enabled Hotspot for Campus (Veeramanickam & Mohanapriya, 2016). A smart campus may have many

other smart features like smart parking, smart inventory, smart lighting, and smart tracking of students, goods and equipment using RFID technology. The smart education institute has smart classrooms, smart corridors with info boards and datacenters for processing all types of data (Simi?, Despotovi?-Zraki?, ?uri?, Mili?, & Bogdanovi?, 2015).

Learning styles

Individual learning styles differ, and these individual differences become even more important in the area of education (Säljö, 1981). Therefore, the real challenge in IoT is keeping the people it is designed for in mind. Learning style is defined as an individual's inherited foundation, particular past life experience and the demands of the present environment that emphasize some learning abilities over others. Educators should be aware of how people obtain and preserve skills and how they access information to help their progress. Some scholars indicate that a primary goal in studying a new medium of communication for educational delivery must be the identification of its impact on learning. Students may benefit from understanding their own learning style by taking measures to adjust the way they acquire knowledge.

While instructors cannot always accommodate each student's need, it is important that several learning opportunities are provided. It is expected that when the learning experience is more effective for the student, an increased level of user acceptance of information systems will result. Researchers believe that learning style is a good predictor of an individual's preferred learning behavior. There was found that a match between learning style and teaching style reveals increases in student achievement and satisfaction. Contrary to these findings, there is no significant relationship between the information-processing characteristics of learning style and performance. In addition, no significant interaction among the factors of learning style, hypermedia's organizational structure and attitude. Learning style does not significantly influence a subject's learning.

While there is plenty of study done on learning styles, there does not seem to be any agreement or approval of any one theory. Furthermore, not all researchers and writers agree with learning style models. A research report from the Learning and Skills Research Center studied many influential learning style models and did a critique of all experimental learning style theories. This

research questions the reliability, validity and implication of learning styles in general. In addition, the authors have criticized some of the research that has used these models including the Kolb's learning style model and disagreed with the way they came to their conclusions. According to the paper, Kolb's Learning Style Inventory (KLSI) in general 'should not be used for individual selection'. Referring to the validity and reliability of KLSI the paper indicated that 'the construct validity of the KLSI has been challenged and there is a long public dispute over reliability of KLSI'(D. Kolb, 1985).

Kolb's Learning Style

David Kolb published his learning styles model in 1984 from which he developed his learning style inventory as shown in Figure 2. Kolb's experiential learning theory works on two levels: a four-stage cycle of learning and four separate learning styles. Much of Kolb's theory is concerned with the learner's internal cognitive processes. Kolb states that learning involves the acquisition of abstract concepts that can be applied flexibly in a range of situations. In Kolb's theory, the impetus for the development of new concepts is provided by new experiences. "Learning is the process whereby knowledge is created through the transformation of experience"(D. Kolb, 1985).

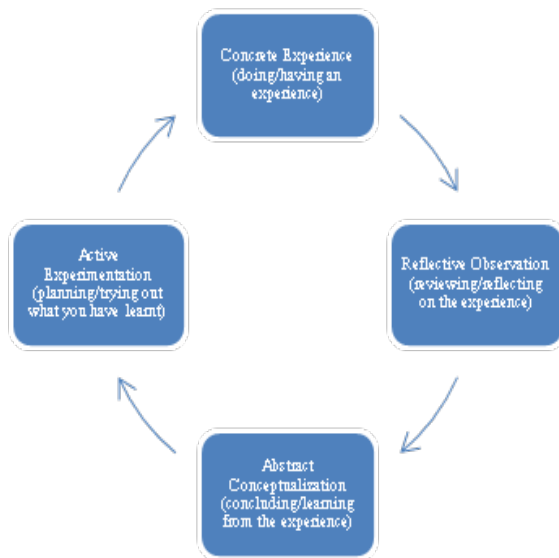


Figure2 – Kolb Learning Style

1. Concrete Experience - (a new experience of situation is encountered, or a reinterpretation of existing experience).
2. Reflective Observation (of the new experience.

of particular importance are any inconsistencies between experience and understanding).

3. Abstract Conceptualization (Reflection gives rise to a new idea, or a modification of an existing abstract concept).
4. Active Experimentation (the learner applies them to the world around them to see what results).

Kolb's learning theory sets out four distinct learning styles, which are based on a four-stage learning cycle. Kolb explains that different people naturally prefer a certain single different learning style (A. Y. Kolb & Kolb, 2013).

Various factors influence a person's preferred style. For example, social environment, educational experiences, or the basic cognitive structure of the individual. Whatever influences the choice of style, the learning style preference itself is actually the product of two pairs of variables, or two separate 'choices' that we make, which Kolb presented as lines of axis, each with 'conflicting' modes at either end:

A typical presentation of Kolb's two continuums is that the east-west axis is called the Processing Continuum (how we approach a task), and the north-south axis is called the Perception Continuum (our emotional response, or how we think or feel about it). Kolb believed that we cannot perform both variables on a single axis at the same time (e.g. think and feel). Our learning style is a product of these two choice decisions. It's often easier to see the construction of Kolb's learning styles in terms of a two-by-two matrix as shown in Table 1. Each learning style represents a combination of two preferred styles. The diagram also highlights Kolb's terminology for the four learning styles; diverging, assimilating, and converging, accommodating:

	Doing (Active Experimentation - AE)	Watching (Reflective Observation - RO)
Feeling (Concrete Experience - CE)	Accommodating (CE/AE)	Diverging (CE/RO)
Thinking (Abstract Conceptualization - AC)	Converging (AC/AE)	Assimilating (AC/RO)

Table1 – Learning Styles Descriptions

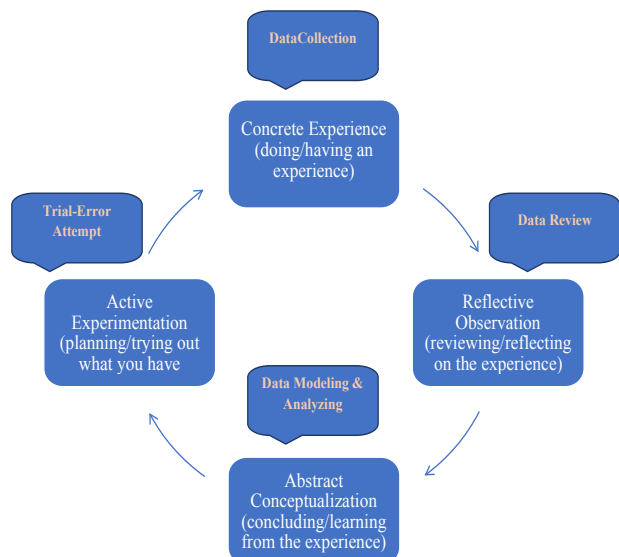


Figure 3 - IoT & Kolb's Learning Style

There are several visions of IoT from different perspectives. As shown in the Figure 3 above, we can define a consistent pattern by using a combination of Kolb's learning style and data centric internet of things. Working with data in IoT is the same as effective learning when a

person progresses through a cycle of four stages: of (1) Data Collection - having a concrete experience followed by (2) Data Review - observation of and reflection on that experience which leads to (3) Data Modeling & Analyzing - the formation of abstract concepts and generalizations which are then (4) Trial-Error Attempt - used to test hypothesis in future situations, resulting in new experiences. Kolb(D. Kolb, 1985) viewed learning as an integrated process with each stage being mutually supportive of and feeding into the next. It is important to follow the stage through its logical sequence and effective learning only occurs when a learner is able to execute all four stages of the model. Therefore, no one stage of the cycle is an effective as a learning procedure on its own.

According to our suggestion accommodators and divergers can perform better in application layer - 60% and 50%, whereas convergers and assimilators in network layer - 50% and perspective layer - 50% respectively as shown in table 2. According to researchers marketing managers are found to be accommodators and engineers tend to be more convergers(D. Kolb & Fry, 1975).

APPLICATION TO STYLE	PER-SPEC-TIVE LAYER	NETWORK LAYER	APPLICA-TION LAYER	STUDENT PERSPEC-TIVE IOT	CLASS PER-SPECTIVE IOT	SCHOOL PER-SPECTIVE IOT
ACCOMODATING	25%	15%	60%			
DIVERGING	40%	10%	50%	Smart bands; smart id cards	Temperature Sensors; Attendance tracking systems;	Environmental Sensors; Smart school bus; Security Cameras
ASSIMILATING	50%	10%	40%	Diary making apps	Interactive displays; visual coding classes	
CONVERGING	40%	50%	10%		AI Robotics Coding Classses; 3D printers	

Table2 – Kolb and IoT Architecture

Conclusion

In this article we displayed the importance of learning style in learning the internet of things and suggested that the same approach may not be suitable for new learners especially in inclusive education. Beginners should consider the way of accommodating according to individual needs. Therefore, some guidelines were suggested in this article. For example, accommodators and divergers can perform better in application layer, whereas convergers and assimilators in network and perspective layers respectively. For software programmers, it is recommended to consider individual's differences which influences on their perceptions, therefore, we suggested that Kolb's learning theory is more practical in IoT applications and best describes the learning process in research and development teams. Moreover, we suggested that the educational environment in inclusive learning should be considered as student, class and campus perspectives of IoT separately, and all the IoT technology and applications, the students will use, should be considered to individual needs. For the future research, it is important to consider the individual difference variables with internet of things' architecture and measure with the method of Kolb's learning style inventory. In order to increase the number of learners and effective users of internet of things, much more investigation is needed to perform. The authors of research tried to make the first attempt toward learning IoT with different individuals by Kolb's theory and they hope that suggestions presented in this study will inspire other researchers to continue efforts in this direction.

With a beginning of Industry 4.0, the Internet of Things has become a driving force and expanding area of research and business. Many efforts from researchers, vendors and governments have been devoted to creating and developing new IoT applications. Along with the current research efforts, we support more insights into the problems of this promising technology, and more efforts in investigating nowadays' research issues.

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Delegation Process in Thai National Digital Identity Platform: A Conceptual Framework

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Abstract

Digital transformation brings great impacts to every economy. Many countries are moving toward setting up a national digital identity platform to facilitate and enable a digital society. Unlike in the physical world where physical documents are needed for delegation, causing handling difficulties on many occasions, the delegation process within the digital platform environment will give stakeholders greater convenience, lower cost, less time consuming, and easier process. The national digital platform can bring about confidence and trust in the user community.

While previous researches on the digital delegation center on the issues of the effectiveness and security of the delegations, no work has yet been focused on the logic based dynamic signature for the blockchain technology which has been implemented as a core block of Thai digital identity platform. This paper proposes a conceptual framework for the delegation process in Thai national digital identity platform (NDID). The framework aims to ensure that the delegation process model can be securely implemented on NDID platform utilizing the blockchain's smart contract to gain users' trust and acceptance.

Keywords

Thai Digital identity platform, Delegation process, Identity delegation, Blockchain, Smart contract

Introduction

Information technology (IT) is a crucial tool for economic development in almost all countries. The Internet also transforms people life by allowing people to access knowledge, products, and services at their fingertips. Social networks formed over the Internet overcome physical territories to connect people nonetheless. Access to social networks and online services requires an individual or entity to enroll or signup for an account to be used as a digital passport with a service provider. The enrollment and identity proofing process may vary by the type of providers and the extent of severity effect of their risk-related services. For example, for financial

services, a strong identity proofing during the enrollment are mandatory; for social networks access, there is no link between real-world identity and digital identity is required. Thus, only email or phone verification is enough (Ali et al., 2017). Nevertheless, the enrollment and identity proofing with every service provider can be cumbersome and creates privacy and security concerns to a user.

To process critical transactions such as accessing to health information, retrieving governmental data, or using financial services, and where physical identity is absent for verification, a trusted digital identity platform would be required (Casillas 2013; Carreto et al., 2016; Mceachern & Cholewa 2017). Therefore, many countries

are heading toward setting up a national digital identity platform to gain users trust, acceptance, and adoption.

While the national digital identity platform alone can bring about confidence and trust to the user community, the delegation within the national digital identity platform is also needed to complete the whole picture of the identity system. In the physical world, the physical documents handling the need for delegation is difficult on many occasions. The delegation process within the digital platform environment will give stakeholders greater convenience, lower cost, less time consuming, and easier process. As the system architecture of a national digital identity platform would be different from one economy to another, the delegation process best fit to a platform should be designed to incorporate the concerned factors of the particular platform. The Digital Identity Platform White Paper (National Digital ID Platform Technical Working Group 2017) for Thailand was published in 2017. The paper points at blockchain technology to be included as a core component but put a pending on the delegation process in the platform system.

Previous research on the digital delegation process centers on the effectiveness issue (Ferraiolo & Kuhn 1992; Ferraiolo et al., 2001; Goyal et al., 2006; Kuhn et al., 2010; Jin et al., 2012), privacy issue (Sanchez et al., 2011; Zhang & Chen 2011), and security issue of delegation (Gomi et al., 2005; Li et al., 2015). However, no work has yet been done on the logic based dynamic signature delegation that uses blockchain technology as a core block for the digital identity platform. This paper proposes a conceptual framework for the delegation process in the Thai National digital ID Platform (NDID). The framework aims to ensure that the delegation process model can be securely implemented on NDID platform utilizing the blockchain's smart contract to gain users' trust and acceptance.

National Digital Identity Models

A secured digital identity platform with a high level of identity assurance and authenticator assurance enables an easier channel for people and all stakeholders to access public and private services such as education, healthcare, and financial services with lower cost, less time consuming, greater convenience, and faster business process (Casillas 2013; Carreto et al., 2016; Mceachern & Cholewa 2017). It also helps reduce risks of privacy leakage through vulnerability channels (Ribeiro et al.,

2017) by reducing duplication of users information maintained by the providers. This is because users can choose to process identity enrollment and proofing with only one provider and use the same identity to access other providers' service without re-iterate the identity enrollment process with another service provider (Tyagi et al., 2018). With these benefits, many countries are heading forward to setup a national digital identity platform (Al-Khouri 2014; Mceachern & Cholewa 2017; Ribeiro et al., 2017; Canadian Bankers Association 2018; Tyagi et al., 2018).

An identity in the digital identity platform normally composes of identification information and personal data such as birthdate, national physical identification number, phone number, gender, contact address, and other attributes which are stored at an identity provider (IdP) or an authoritative source (AS). These data can be requested by a replying party (RP) when users initiate a service request through the RP. The relying party can then store the received information for its own further usage which create concerns to the users in term of their privacy especially on linkage of information between providers that can be used to analyze users' behaviors (Zhang & Chen 2011; Khatchatourov et al., 2015). Therefore, privacy should be focused during the design of a digital identity platform to allow users to give their consent to the processing of their selected data by any provider (Poursalidis & Nikolaou 2006; Saxby 2015).

A digital identity model consists of the following main components:

- (1) Entity or user: a person or a legal entity who wants to apply for a service which requires an identity proofing
- (2) Identity Provider (IdP): a trusted person or organization responsible for:
 - User enrollment and identity proofing by verify the entity and validate entity data and attributes
 - User credential management, which links identity with the user authenticator where user credential might be a document or group of data issued to the entity by a government agency or an authoritative source. For example, identification card, passport, and e-certificate, etc.

- (3) Relying Party (RP): a service provider who benefits from IdP on the platform to verify its potential clients before giving services to them
- (4) Authoritative Source (AS): a registry, a government agency, or a trusted organization who is the source of registered data. For example, Department Of Provincial Administration, Thailand, is the source of a person identification; National Credit Bureau is the source of a person's or entity's credits; Ministry of Foreign Affairs is the source of passport data; the Department of Transport is the source of driving licenses, etc.

With the above basic components, each digital identity platform may be different in details. For example, Grassi et al., (2017) combined IdP and AS under a new role called credential service provider (CSP). The process flow would then start from an entity approaches a CSP for enrollment and identity proofing. Succeed applicant will then become a subscriber of that CSP which will issue or enroll an authenticator of the subscriber in its system for further usage. Once there is a request from RP, CSP will do both the authenticator validation and attributes provider for the subscriber.

Models of national digital identity management can be classified by the data storage and access types into the following three categories:

- (1) Centralized: all users' credentials and attributes are stored and managed by a single IdP to serve many RPs. For example, Aadhaar system of India (Tyagi et al., 2018), e-ID and X-road of Estonia (Martens 2010; Pappel & Pappel 2011), the national digital ID of China (Wildau 2017), and NDI (National Digital ID) of Singapore (Sin 2018).

Centralized identity management has an advantage of easy management because all policies and control can be implemented at a single point (centralized) with the biggest disadvantage of the security threat from a single point of failure. If the system is vulnerable or attacked, the whole system will be out of service. Therefore, the system is targeted for attacks, and if someone can hack into the system, he or she can get information of all identities which was happened to Aadhaar (Mali & Avila-Maravilla 2018). Besides the security issue, this model also suffers from privacy issue as the single IdP has all information and transactions of every user.

- (2) Federated: IdP and RP are registered under an established identity federation which creates a trusted network. Example of economies that use the federated model are Canada (DIACC 2017; Canadian Bankers Association 2018), Australia (Commonwealth of Australia (Digital Transformation Agency) 2018), Denmark (Danish Ministry of Finance 2016), Japan (Nikkei Asian Review 2017), Thailand (National Digital ID Platform Technical Working Group 2017), and EU (Ribeiro et al., 2017).

The federated model has many advantages such as no single entity that stores all users attributes and credentials which limits the data leakage to an attacker if an IdP system is hacked. The model also enhances privacy through the use of multiple IdPs, allows greater cost effective due to the minimum storage and access of RP, and avoids a single point of failure because if an IdP is unreachable the user can still use an alternative IdP. However, this model has some drawbacks such as privacy issues because IdP knows all service requests of its users, and RP has to ask the users for the IdP that they are using the service.

- (3) Distributed: users are equipped with tools to allow or disallow RP to access their identity attributes, and in some cases, a pseudonym can be used to access or request services which help protect their privacy. Example of systems which are implementing under the distributed model is e-Residency of Estonia (Sullivan & Burger 2017), Thai national digital ID platform (National Digital ID Platform Technical Working Group 2017), and a digital identity system in Japan (Nikkei Asian Review 2017).

One example of the technology used to implement this identity management model is the blockchain technology which supports transparency. This model distributes data to store in each member node, but there is only one authorized party having the right to open and read these stored data once the block is created and linked to the chain, proving both tamper evident and tamper resistant (Nakamoto 2008). Even though the system is hacked, no data can be read as it is encrypted. The blockchain technology is an emerging technology. Therefore more efforts are in need to make the technology works in the set environments and requirements.

The delegation is an essential tool for an entity to give its power to one or more delegates to act on its behalf. According to the digital identity management models listed above, the delegation process may differ in each model. While some national digital identity systems offer the delegation services to the end users (Danish Ministry of Finance 2016; Ribeiro et al., 2017), some intend to

offer in the next phase, including the Thai national digital identity platform (National Digital ID Platform Technical Working Group 2017; Commonwealth of Australia (Digital Transformation Agency) 2018). From the review of literature, Table 1 summarizes the digital identity systems in ten economies.

Table 1 - Summary of Digital Identity Systems

Economy	Digital Identity Management Model	Platform/System	Cross Border	Delegation Process	Implemented Industry	Privacy Protection
Australia	Federated	OIDC and SAML	No	Intended	Finance	Yes
Canada	Federated	Blockchain	No	Intended	Multiple Industries	Yes
China	Centralized	WeChat	No	No	Finance	No
Denmark	Federated	XACML and SAML	Within the EU	Yes	Multiple Industries	Yes
Estonia (e-ID)	Centralized	OpenXAdES	Within the EU	Yes	Multiple Industries	No
EU	Federated	SAML and RESTful	Within the EU	Yes	Multiple Industries	Yes
India	Centralized	QR code XML API	No	No	Multiple Industries	No
Japan	Planning for Federated	Blockchain	No	No	Finance	Yes
Singapore	Centralized	RESTful API OAuth2.0	Intended	Yes	Finance E-gov	Yes
Thailand	Distributed Federated	Blockchain RESTful	No	Intended	Finance Insurance	Yes

*Note: Intended — not available now but there is an intention to offer in the future; Multiple industries — i.e., finance, healthcare, e-commerce, insurance, and e-government

Table 2 - Summary of Researches on Delegation Models

Model	Type of Delegation	Main Concept	Privacy Protection	Platform or Language	Identity Management Model
DSUIDM for SOA (2011)	person to person	pseudonym-based and proxy signatures schemes	Yes	WS-Federation	Federated
D1LP (2003)	principles k-out-of-n thresholds	attribute-based delegation and trust management	Not available	D1LP, logic programming-based language	Distributed
DBAC (2005)	person to provider	delegation chain recursively	Yes	SAML	Federated
D-FOAF (2006)	person to resource	Dijkstra algorithm	Yes	P2P FOAFRealm and FOAF metadata	Distributed
Extending SN with Delegation (2017)	person to task	socio-technical design principles and theory of cooperation and collaboration	Yes	Facebook APIs	Centralized
Dynamic groups Signatures (2005)	the entity to group members	trusted party for initial key generation	Not available	Algorithm	Centralized

*Note: Principle — a person or legal entity or computer; entity to group members — organization delegates its power to a group of representatives

Delegation Models

Delegation models to deal with security and authorization issues in digital platform have been studied since the early day when multi-user computer systems were introduced. The role-based access control (RBAC) model was proposed to give permission to a user based on his role(s) to access computer resources (Ferraiolo & Kuhn 1992; Sandhu et al., 1996; Ferraiolo et al., 2001). For example, administrators have permission to access all files and applications on the server, whereas operators can only access a limited set of files and folders which they need to work with. The disadvantages of the RBAC model are that the permission cannot be changed according to the time of access, and the organization needs to set up a structure to fit its work process so that the right groups of users and permission for each group can be established. The situation is a complicated and time-consuming task

for a newly setup organization. The attribute-based access control (ABAC) model was then introduced to give access permissions to users related to their specific attributes (Li et al., 2003; Yuan & Tong 2005; Goyal et al., 2006), i.e., undergraduate students are eligible to get a discount for a cloud storage service, etc. The ABAC model takes less time to set up as the required attributes are easier to plan or set.

With the limitations of the RBAC model and the benefits of the ABAC model, modifications to these models are needed. The drawbacks of the RBAC model are the inability to change the permission of a user upon variables such as working hours, and the complexity of the initial setup roles and permissions structure. The benefits of ABAC model are the fast and convenience permission set-up, and the changeability of options related to any required attributes. Thus, some studies then suggest the addition of attributes

into the RBAC model (Kuhn et al., 2010; Jin et al., 2012) to make the new model more simple and flexible. There are studies that use logic programming to put constraints over the attribute-based access so that the system will process according to the required conditions (Li et al., 2003; Wang et al., 2004). For example, the service request can be initiated by combining the request from 2 people out of 4 representatives or a financial transaction can be submitted if the two financial officers are agreed. The examples above are a normal criterion for a legal entity, a company or an organization to process a legal or binding transaction which might be able to adapt to be used with the delegation on the digital identity platform. Li et al., (2003) did the research in this path, to propose a DILP as a delegation logic program which supports delegation and chain of delegations, that allows a number of maximum iterated delegations set by a user, however, this work still lacks the time constraints for the delegations. As the time constraints option is an important function for the identity delegation in the digital identity platform, further study should work on the issue to extend the DILP capacity if it is used in the digital identity platform.

Moreover, as the structure of the organization can be changed from time to time, the organization management team might also be altered after the delegation was done, the system should be able to handle this dynamic group delegation (Bellare et al., 2005) so that the original delegators during the time of delegation can still be recorded and tracked even after they are no longer be with the organization. The revocation is another attribute which the identity delegation should be provided. Besides, the delegation in the federated identity management platform should be a user-self process so that users can start and manage as well as change or revoke the delegation by themselves. The RP would then control access to the services according to the delegation initiated from the delegator through the authentication of delegatee by IdP (Gomi et al., 2005). Table 2 summarizes 6 main digital delegation models from the literature reviews which should be considered for the delegation in the national digital identity platform. The table includes the model, type of delegation, main concept of the model, whether users are offered with the privacy protection options, platform or language used by the model, and the appropriated identity management that the delegation model is suitable for.

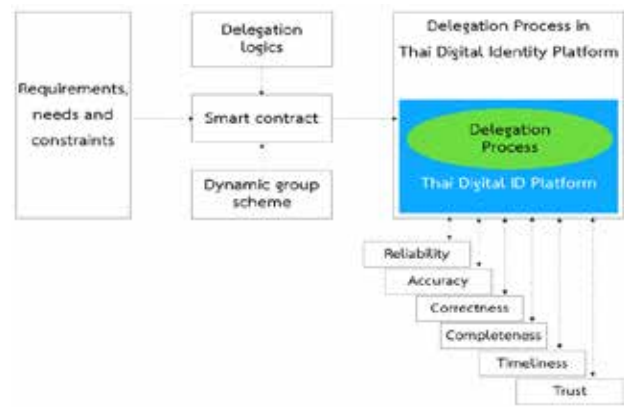


Figure 1 - The conceptual framework for the delegation process in the Thai National Identity Platform

Conceptual framework for the delegation process in the Thai National Identity Platform

The study of the national digital identity platforms and the delegation models as described in previous sections point out the gap of research on the identity delegation model in the Thai national digital identity platform which has not yet been done before. As the Thai digital identity platform is based on the blockchain technology which is an emerging technology (Wolfond 2017; Dunphy & Petitcolas 2018; Gao et al., 2018). The proposed delegation process should address the technology underlining the platform under the Thai contexts; requirements, needs, and constraints. The present study brings the advantage of the smart contract (Buterin 2014; Xu et al., 2018) on the blockchain technology combined with the delegation logics and dynamic group scheme to form an innovative delegation process in the Thai digital identity platform. A full-blown research project of the first author uses the conceptual framework shown in Figure 1. The framework aims to ensure that the delegation process model can be securely implemented on NDID platform utilizing the blockchain's smart contract to gain users' trust and acceptance.

The delegation logic shall be developed under the delegation process to handle the conditions or constraints of the delegation which will be propagated to all member blockchain nodes (refer to the technical architecture of the Thai NDID platform (National Digital ID Platform Technical Working Group 2017)). The members of blockchain nodes include RP, IdP, and AS (Figure 2) so that the delegation process in the Thai NDID platform can be executed properly, correctly, and identically. The advantage of the logic-based smart contract on blockchain is that it is easy to implement and easy to

interpret (Idelberger et al., 2016) which is appropriate for the Thai NDID platform. To gain the most operational and economic benefits of the logic-based smart contract for delegation process, the model should be properly designed (using the requirements, needs, and constraints from the local stakeholders), and tested the reliability, accuracy, correctness, completeness, and timeliness of the model that will create trust to the user and will lead to the adoption of the model.

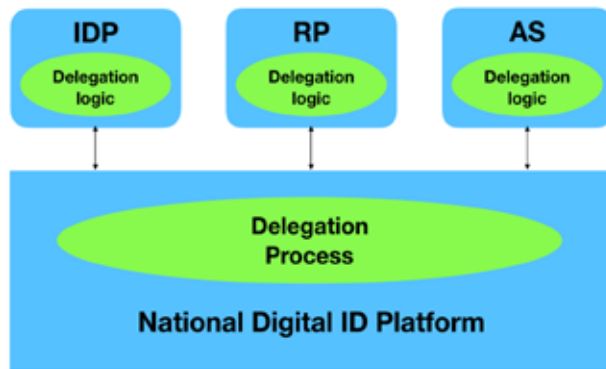


Figure 2 - Delegation logic within blockchain member nodes in the Thai National Digital Identity Platform

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Challenges and Opportunities in Adopting Telemedicine in Yemeni's Healthcare System

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Abstract

The concept of telemedicine is top of the agenda for many healthcare delivery issues worldwide. Yemen healthcare system has difficulties in delivering the healthcare to country wide due to the lack of health facilities and health physician shortages. The objective of this study is to highlight the challenges and opportunities that influence the adoption of telemedicine in Yemeni healthcare system. To achieve current research objective, an intensive literature review has been conducted by analysing what have been done of researches in these arias, spatially for the challenges and opportunities that effect telemedicine technology adoption in Yemen. The findings suggest that telemedicine technology have the potential to help in overcoming the lack and imbalance of health physician as well as improving health accessibility, quality and the cost of medical consultation. These reviews will shed some light and potential health solutions for telemedicine technology applications for future researchers.

Keywords

Technology adoption, telemedicine, health professionals

1. Yemen health status

The current healthcare delivery system in Yemen cannot meet the current healthcare demands (Al-Fadhli, Othman, & Al-Jamrh, 2017; MoPHP, 2010). Yemen has limited resources with large area as to invest in health sector and build an infrastructure countrywide. Health sector in Yemen cannot deliver the health services to entire population specially who lives in rural area which contains 65.4% of total population (Factbook, 2015). Due to the lack of health facilities and health professionals (OCHA, 2016). patients are suffering from the cost of treatment especially those who lives in rural areas that carry heavy burden in term of travel costs, accommodation cost and time spent to get health treatment in cities or in the capital and sometimes overseas if called an emergency case (Al-Fadhli et al., 2017; Campbell, Fauveau, ten Hoope-Bender, Matthews, & McManus, 2011; WHO, 2006). According to (unicef and UNICEF (2014); WHO (2010a)) government health service has low quality and the accurate diagnosis of disease is very difficult, though, patients use

private facilities in spite of their unaffordability. Yemen has poor quality and reliability in services laboratories and physicians failed to make accurate diagnoses (A. W. Al Serouri, Al Rabee, Afif, & Al Rukeimi, 2009; OCHA, 2016).

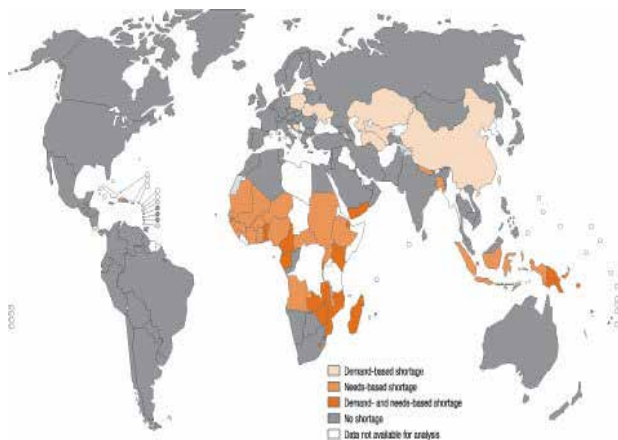
Yemen is one of the developing countries that suffer from its poor health care facilities. Yemen Health sector cannot deliver the health services to entire population specially who lives in rural area due to the lack of health facilities and health professionals (OCHA, 2016; WHO, 2013). Yemen health facilities have increased between 2005 and 2010 (MoPHP, 2010). Although, MoPHP and Local Councils added infrastructure and created further pressure on the system to provide adequate staff and equipment, the existing system was already suffering from severe shortages in all areas (USAID, 2011). Comparing healthcare services with urban, only 25 percent of rural areas in Yemen are covered by healthcare services in contrast with urban areas which healthcare services covers about 80 percent (Van Lerberghe et al., 2014). However,

the operating healthcare facilities of public sector are only 77% and the healthcare services provided is not sufficient to population and human resource will likely alleviate inequity to a greater extent than health care infrastructure investments alone (Elgazzar, 2011). The adoption of a telemedicine technology in a health organization is due to the need to solve health problems and improve the current health status (Buabbas, 2013).

In where , Yemen is one of the poorest countries in the world located in Southwest Asia at the southern tip of the Arabian Peninsula and considers as the second largest country in the peninsula with total area of 527,968 sq km. Yemen has 26,052,966 populations and 67.7% of its population lives in rural areas and 45.2% of population is below poverty line. Yemen has more than 200 islands in both red sea and Gulf of Aden.

1.1 Shortage of health professionals

Health personnel shortage is spread round the world especially in low-income countries(Naicker, Plange-Rhule, Tutt, & Eastwood, 2009; Okyere, Mwanri, & Ward, 2017). The shortage of health workers is greatly affect the healthcare accessibility and health quality (Okyere et al., 2017), 4.3 million health workers is the amount of shortages around the world. The highly affected countries by health professional shortages are those with low-income (WHO, 2010b). Developed countries like US the doctor ratio is 1:200 to 1:500 which means that one doctor serve every 200 to 500 people, meanwhile, Yemen has less than 2 doctors for 10,000 persons (Factbook, 2015).



Physician shortages in 2015 based on demand and need models (Scheffler, Liu, Kinfu, & Dal Poz)

Other indicators can be used to determine the country level of health worker shortage are mortality rates, cross infection, and patient accidents which consider very high in Yemen comparing to other countries (O'Brien & Gostin, 2011). Many people in 57 countries Yemen is one of these countries that suffering from the severe health workforce shortages (Naicker et al., 2009; Rowe, de Savigny, Lanata, & Victora, 2005). This shortage and even imbalance of health worker distributions have impact on access and quality of healthcare services. The shortage of specialists as well as generalists is widespread throughout the country (USAID, 2011). According to Draghma (2012), the major problem Yemen facing in health sector is understaffed medical centers. About 64% of births are attended by unskilled staff because of the shortages of qualified healthcare workforce especially female and poor of public facilities (Kempe, Theorell, Alwazer, Christensson, & Johansson, 2013; USAID, 2011).

1.2 Imbalance of health professionals

Not only health professional's shortage Yemen is suffering from, but also the distribution of health personnel which aggravating the situation. Health workers in Yemen are not distributed equitably. For example, some cities have more concentrated health workforce however, it contains lower population such as Aden city that has 10.7% of the total health workforce with half a million population. While another governorate like Taiz with more population 2.4 million and has less of health workforce 8.3% (WHO, 2009).

The lack of equity of the human resources distribution can affect the ability of the health systems to deliver (Alshakka et al., 2014). Health workers shortage influence the health care accessibility and become more severe when accompanied by unequal distribution of health workers (Okyere et al., 2017). However, it considered very difficult to provide continuous medical education for those doctors who works in rural areas (Al-Fadhli et al., 2017). Thus, developing countries are still investing in health sectors and looking for sustainable solutions

Many specialists operate outside of the public health sector and health professionals are concentrated in urban health facilities and private centers. It is widely accepted that the rural areas are deprived of health professionals and there is a lack of mechanisms (recruitment & retention strategies) that motivate and encourage skilled personnel to move to the rural areas (USAID, 2012). In low income

countries healthcare workers prefer to work at urban areas which cause the shortages (Taylor & Dhillon, 2011). That is how health personnel in Yemen distributed to the stage that become surplus in some urban hospitals and severe shortage in rural hospitals. In 2010 there were no specialist or any physician in the public health facilities in some governorate such as Al Jawf; Amran (USAID, 2011). The USAID (2011) final report recommended that ministry of public health is better off with closing all clinics that have serious staff shortages, poor budget or no equipment.

1.3 Immigrate of health professionals

The current concerns of developing countries is the loss of highly skilled health personnel. One reason for health workers immigration and turnover is due to the wages differences (Bukach, Ejaz, Dawson, & Gitter, 2017). Yemen is exporting large number of its health workers to neighbor countries and some of the developed countries to fill gaps of their own healthcare workers. To deliver basic healthcare services to all population, Yemen needs additional of 75,000 healthcare workers to cover all areas. Moreover, if government train those additional healthcare workers, it will cost more than 136 USD million per year (O'Brien & Gostin, 2011). According to Multilateral agreement amongst all 193 WHO member states the developing countries faced long-standing issue in term of health personnel immigrant; however, it now considered as conflicting with high income countries interests. One of the main reasons for health professional's shortages is the increase of international migration of doctors (WHO, 2010b). According to Global Policy Advisory Council high income countries and Gulf region are attracting highly skilled doctors from low income countries which are in border with Yemen. However, in Gulf region there is more demand for healthcare workers which make negative affect for the poor countries healthcare systems. The reasons behind migration are high wages, working environment, and working opportunities (WHO, 2010b). Thus, Yemen is poor country with limited resources, low salaries and bad working conditions, so any incentives from wealthy destination states will influence health workers to international migration (Taylor & Dhillon, 2011).

1.4 Skills and competences of health professionals

It's believed that the highly skilled health care workers can provide better healthcare services. According to Bukach et al. (2017) career advancement has positive

effect on the health workers turnover. Qualified and motivated healthcare workers are essential for adequate health service provision (Dieleman & Harnmeijer, 2006). To make things worse, Yemen is exporting the highly skilled health workers to other high-income countries. Many people have fled Yemen, including highly trained and specialized medical staff (Marshall, 2012). Migrants who move to high income countries are considered as highly skilled and those highly skilled migrants occupied 65% of the total migrants Stilwell et al. (2004) and most of the highly skilled migrations are health workers (WHO, 2010b).

The cause of shortage, imbalance and immigrate of health professionals, are due to the political and economic crisis of Yemen. For example, low wages of health worker leads to relocation or immigrate of specialist Bukach et al. (2017) that cause the shortage of specialist and highly skilled health care workers which aggravate the problem. Telemedicine have the potential to overcome challenges of health professional's shortage (Marcin, Rimsza, & Moskowitz, 2015), unequal distribution of health personnel (Zollo, Kienzle, Henshaw, Crist, & Wakefield, 1999), moreover, improve healthcare service quality (Hersh et al., 2001).

Yemen healthcare system has challenges of making healthcare service accessible in countrywide especially at rural areas in where three-quarters of the population live (Al-Fadhli et al., 2017; ten Hoope-Bender, Campbell, Fauveau, & Matthews, 2011). Study of Health Needs Assessment by Al-Fadhli et al. (2017) has identifies three main needs; provision of quality health services, provision of health professionals and information management needs; the study also suggested the adoption of telemedicine as to overcome the challenges and to cover those needs.

2. The role of technology in healthcare

Technologies can overcome obstacles; solve problem increase productivities in organizations in different industries. For example, healthcare sector challenges that include the quality of healthcare received by patients. healthcare in least developed countries offer poor quality of medical care in rural facilities due to the fact that qualified doctors available in urban areas in where they can get high wages and to avoid the professional isolation (Som, Norali, & Ali, 2010).

One reason for countries to invest in technologies is to improve healthcare services. Investment in health sector is considered as vital process for economic and social progress. The level of healthcare status of a country is an important indicator of its development (Kickbusch & Nutbeam, 1998; Michalos, 2017). For example, the advancement of technology play a crucial role to the healthcare status of the country, not only in healthcare service content, but also in the way the healthcare is delivered. In developing countries access to healthcare service is one of the critical issues from which health system suffer. According to (Renfrew et al. (2014); UNFPA (2014)) about 3 million newborn babies around the world and an approximate of 289,000 women died in the year of 2013. The most cases are because of the illnesses and complications that could be prevented with basic antenatal care and the availability of midwife during delivery. In developing countries several problems involved in delivering health care services to countrywide such as shortage of trained and experienced doctors, imbalance of healthcare workers (Alshakka et al., 2014), lack of funds and constraint resources, limited healthcare facilities and unequal distribution of an operating facilities (Al-Fadhli et al., 2017; Gollogly, 2009). All these obstacles make it hard for patient to access to healthcare services on time when needed. Patient in rural areas encountered poor roads, limited transportation, and high cost of travel to the nearest health care facility (Al-Fadhli et al., 2017; Van Dyk, 2014).

With the development of science and technologies, there are improvements in the provision of healthcare services over distance, which called telemedicine. Information and communications technology and (ICT) in general are an enabling technology to provide various solutions in the healthcare sector. Telemedicine has been defined by Reid (1996) as “the use of advanced telecommunication technologies to exchange health information and provide healthcare services across geographic, time, social, and cultural barriers”. In fact telemedicine technology in developing countries might have a more profound influence than on developed ones (Edworthy, 2001; Zailani, Gilani, Nikbin, & Iranmanesh, 2014). Health information systems and telemedicine have the potential to overcome the challenges encountered in healthcare systems in least developed countries (Ekanoye et al., 2017; Wootton, 2008)

The deployment of technology like telemedicine is crucial in developing countries in where shortage of doctors exist and patient travel long distance by foot to get access to nearest hospital (Rao & Lombardi 2nd, 2009). Telemedicine technology considered as new technology in the environment of developing countries and has succeeded “in providing quality of health services for people who live in rural areas” with example of such poor country like Nepal which has suffering from the shortages of health specialists and poor healthcare quality (Graham et al., 2003). Another example of telemedicine is on Ethiopia which has 85.3% of total population living in rural area and hard to access medical care due to the shortages of doctor and poor healthcare facilities (Androuchko & Nakajima, 2004). Thus, developing countries have realized the crucial role of telemedicine technology and the benefits in providing high quality of healthcare services (Edirippulige, Rohana, Marasinghe, Abeykoon, & Wootton, 2009). Patient and health service providers in Yemen health system have high level of dissatisfactions due to difficulties in the access and poor quality (A. Al Serouri, Al-Mudhwahi, Øvretveit, & Al-Gonaid, 2011; HESAS, 2003; Serouri, 2004).

Telemedicine can play important role as to overcome several issues, for example, provide high quality of medical care over distance treatment advice and diagnosis. Moreover, telemedicine has the potential to provide continuous education for professionals at remote areas. Implementing technology like telemedicine can improve the quality of healthcare services in remote communities (Nesbitt, Marcin, Martha, & Cole, 2005). Patients are likely to use the telemedicine if they are advised by doctors (Gagnon, Orruno, Asua, Abdeljelil, & Emparanza, 2012).

With the development of telecommunication technology and internet revolution, technology spread in several industries and the cost become cheaper. Limited resources organizations in developing countries invest in technology as to improve the productivity and the cost. In healthcare sector with the availability and advanced of telecommunication technologies, the investment of such a health information system and telemedicine technology is affordable by developing countries and rural health facilities. In fact offering healthcare services to poor societies under the traditional healthcare system is inefficient and required high cost to operate (Gollogly, 2009). Health information technology has

great opportunities for improving efficiency and reduces the medical cost which has been proved by researchers, however, these technologies are widely available and have not utilized properly (Ahlan & Ahmad, 2015)

Telemedicine solutions have the potential to improve the quality of healthcare and offer efficient way to access to medical expertise with low cost (Menko, Visser, Janssen, Hettinga, & Haaker, 2013). Researchers have indicated that telemedicine will become essential part of healthcare to fill up the need of healthcare to societies (Khan, Qurashi, & Hayee, 2007). Patients in remote communities would decrease the travel to urban for healthcare services in where telemedicine technologies exist, although, telemedicine has the potential to make great economic contribution in rural community (McCarthy, 1995).

Telemedicine has the potential to make healthcare service accessible regardless of the obstacles such as social, economic place and time (Jennett et al., 2005). In this case rural providers and patients are highly satisfied with telemedicine (Nesbitt et al., 2005).

Conclusion

This paper presents the challenges and opportunities for Yemeni healthcare system in adopting telemedicine technology. The above discussion highlighted the current health status in Yemen and focus on the health delivery, and quality of healthcare service. The main challenges this paper focus is the lack of health facilities and the shortages, immigrant and the imbalance of health professionals. This study pointed out the role of telemedicine technology in overcoming challenges with example of similar countries environment, these reviews will shed some light and potential health solutions for telemedicine technology applications for future researchers.

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The Study on the Effect of Self-Service Technologies Service Quality, Novelty, and Social Presence on Repatronage Intention of Cashierless Store

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Abstract

Due to the rapid advancement of technology, cashierless stores, which combine artificial intelligence (AI) and Internet of Things (IoT), emerged. After the launching of Amazon Go, countries around the world followed this trend, for instance Taiwan's X-Store and China's Bingo Box. In addition to reducing labor costs, company anticipates by setting up cashierless store can increase shopping speed, autonomy, and convenience through self-service technologies (SSTs) and cashless transaction and thereby increase customers' shopping experience and loyalty. However, what customers anticipate is the value they perceived. Furthermore, human warmth is one of the important traits that Taiwan people valued. Since cashierless stores are unmanned, whether cashierless stores can provide the warmth that is similar to regular store remain unknown. Thus, this study aims to explore the effect of self-service technologies service quality, novelty, and social presence on repatronage intention through perceived risk and perceived benefit.

Keywords

Cashierless Store, Self-Service Technologies Service Quality, Novelty, Social Presence, Repatronage Intention

Introduction

With the rapid development of artificial intelligence (AI) and Internet of Thing (IoT), the increase cost of human resource and the approach of aging society, retailers around the world are paying attention to cashierless store. For example, according to the U.S Department of Labor, U.S employment costs increased greatly in the second quarter of 2018 when compare to last year due to accelerated worker compensation and welfare growth [1]. Minimum wages in China are also continue to grow rapidly [2]. On the aging society side, Taiwan now officially becomes an aged society [3]. Japan is also facing the challenge of shrinking and aging population [4]. In fact, 7-Eleven of Japan is considering ending the practice of running its store for 24 hour a day due to labor shortage. In addition to this, 7-Eleven of Taiwan has announced that 400 of the Taiwan 7-Eleven store

will no longer operating for 24 hours a day [5]. Under those circumstances, at the end of 2016, Amazon opened their first cashierless store for employee, Amazon Go. It provides the most advanced shopping technology and incorporates automated self-checkout system for customers to experience. In the following year, 7-Eleven in Korea also launched their cashierless store, 7-Eleven Signature. Moreover, China's startup company launched Bingo Box in 2017 as well, a cashierless convenience store chain. Two years after Amazon's launch, Japan's Lawson, Taiwan's 7-Eleven and FamilyMart started to introduce their own cashierless store. From retailers' point of view, by launching cashierless stores they can achieve cost reductions, efficiency, flexibility, and productivity and improve corporate performance [6,7]. Furthermore, to solve the problem of labor shortage. In addition, retailers believe cashierless stores can increase customers

shopping experience, which will lead to customer loyalty in the long run. However, from customers' point of view, cashierless store does not necessary satisfy customer's need [8].

Cashierless stores provide two characteristics to their customers, self-service technologies (SSTs) and novelty. Self-service technology technologies (SSTs) are the fundamental requirement for cashierless store [9]. These technologies altered not only the way customers interact with retailers but also the way retailers communicate with their customers by allowing customers to create service outcomes without direct involvement of service employee. Novelty is another fundamental characteristic. It is, in fact, a fundamental characteristic of any innovation [10]. As a matter of fact, cashierless stores in Taiwan are still considered as IT innovations since it currently only open for less than a year. When compare to regular stores, they may be considered to be novel, in other word, new and refreshing. However, when a customer evaluate a product or service, they weigh its perceived value against the asking price [11]. To put it another way, customers value their benefit and their cost. Therefore, their perceived benefits and perceived risks will influence their decision of adoption. Given these points, one of our research questions is as follows: How does SSTs service quality and novelty influence perceptions of risk and benefit when considering the repatronage intention of cashierless store?

With the growing popularity of cashierless store around the world, an argument arises, which is cashierless stores results in a reduction in customer service and the depersonalized atmosphere [12]. Similar to electronic commerce, a notable difference between cashierless stores and regular stores is the decreased presence of human and social element in the cashierless environment [13]"container-title":"International Journal of Human-Computer Studies","page":"689-708","volume":"65","issue":"8","source":"ScienceDirect","abstract":"Electronic commerce typically lacks human warmth and sociability, since it is more impersonal, anonymous and automated than traditional face-to-face commerce. This paper explores how human warmth and sociability can be integrated through the web interface to positively impact consumer attitudes towards online shopping. An empirical study was undertaken to investigate the impact of various levels of socially rich text and picture design elements on the perception of online social presence and its subsequent effect on antecedents of attitudes towards websites. Higher

levels of perceived social presence are shown to positively impact the perceived usefulness, trust and enjoyment of shopping websites, leading to more favourable consumer attitudes. Implications of these finding for practitioners and future research are outlined.","DOI":"10.1016/j.ijhcs.2006.11.018","ISSN":"1071-5819","journalAbbreviation":"International Journal of Human-Computer Studies","author":[{"family":"Hassanein","given":"Khaled"}, {"family":"Head","given":"Milena"}],"issued":{"date-parts":[["2007",8,1]]}}},"schema":"https://github.com/citation-style-language/schema/raw/master/csl-citation.json"} . Regular store shopping experience involve various types of social interaction with humans [14]. On the other hand, cashierless store shopping experience can be seen as lack of human warmth and sociability since it tends to be more automated. As a matter of fact, Taiwan's X-Store's expansion plan has been shelved due to customers still prefer a service with warmth, thinking that cashierless store is too deserted. Shopping experiences that associate with positive emotions are, in fact, linked to several important results. For example, increased time spent in the store and increased spending and unplanned purchasing [15,16]. In all honesty, the social aspect of shopping are one of the major contributor to positive emotion [16,17]. Since cashierless stores are unmanned, retailers face a challenge in making their cashierless store socially rich. Therefore, another research question emerged, does social presence, which provided by the technology-based communication channel of cashierless store, influence customers' perceived risk and customers' perceived benefit and further influence customers' repatronage intention? With these research question, our purpose of this study is to explore the relationship within SSTs service quality, novelty, social presence, perceived risk, perceived benefit, and repatronage intention.

Literature Review and Hypotheses

Self-Service Technologies Service

Self-service technologies (SSTs) are one of the necessary part in cashierless store. It can be defined as technological mediums that allow customers to perform a service independently without direct involvement of service employee [18]. In other words, SSTs require customer's active engagement with the technological mediums. Therefore, the delivery of services is different from face-to-face interaction with service employee. The success of services delivery is depends on customer's engagement, knowledge, behavior, and skills to complete the

transactions [9]. Hence, the quality of service provided to customers becomes critical. SSTs' service quality is defined as an overall assessment of a particular service company by comparing that company's performance with customer's general expectations of how the industry should [19,20].

Many literature provides different scales to measure service quality. Parasuraman, Zeithaml, and Berry [19] developed a 22-item SERVQUAL scale of five dimensions that can be used to measure customer perception of service quality provided by service employee. However, this scale may not be suitable to measure the different aspects of SSTs' service quality. Over the past decades, measures that can evaluate technology based services are also developed. Zeithaml, Parasuraman, and Malhotra [21] developed seven dimensions that can be used to measure e-service quality. These dimensions included efficiency, reliability, fulfillment, privacy, responsiveness, compensation, and contact. Barnes and Vidgen [22] extended the SERVQUAL scale and developed WebQual Index that can be used to measure customer perceptions of Web site quality. Their index included ten dimensions: aesthetics, navigation, reliability, competence, responsiveness, access, credibility, security, communication, and understanding the individual. In addition to this, Yoo and Donthu [23] also developed an instrument to measure the perceived quality of internet shopping site (i.e., SITEQUAL) including the following four dimensions: ease of use, aesthetic design, processing speed, and security. Similarly, Madu and Madu [24] proposed 15 dimensions that measure online service quality: performance, features, structure, aesthetics, reliability, storage capacity, serviceability, security and system integrity, trust, responsiveness, product differentiation and customization, web store policies, reputation, assurance, and empathy.

Most of the existing research on the measurement of the SSTs service quality has focused on e-service. However, Lee et al. [7] adopted Dabholkar, Shepherd, and Thorpe's [25] difference scores scale to measure the self-service kiosks' service quality, which include four factors, reliability, personal attention, comfort, and features. In addition to this, Lin and Hsieh [26] developed a seven dimensions scale, which includes functionality, enjoyment, security, assurance, design, convenience, and customization, specifically for SSTs.

Perceived Risk

Perceived risk is often considered to be the possible negative outcome of using a product or service. Bauer [27] formally defined perceived risk as "a combination of uncertainty plus seriousness of outcome involved" and Peter and Ryan [28] defined perceived risk as "the expectation of losses associated with purchase and acts as an inhibitor to purchase behavior." According to Featherman and Pavlou [29], Likert scales has been used to measure perceived risk in order to evaluate the perception of risky events occurring in a service or product. In other words, perceived risk is measured through expectancy-value methodology, which is typically multiplying the probability of loss or danger by the cost or significance of that possible loss or danger. In view of above explanation, Featherman and Pavlou [29] defined perceived risk as "the potential loss when pursuit desired outcome while using service", which is adopted in this study.

Perceived risk was identified into two major categories by Cunningham [30], which were performance and psychosocial. He first divided performance into three parts, which were economic, temporal, and effort; and then divided psychosocial into two parts, which were psychological and social. Furthermore, he characterized perceived risk into six dimensions, which include performance, financial, opportunity/time, safety, social, and psychological loss. In addition to these dimensions of risks, Bellman, Lohse, and Johnson [31] NY", "genre": "SSRN Scholarly Paper", "source": "papers.ssrn.com", "event-place": "Rochester, NY", "abstract": "Consumers worldwide can shop online 24 hours a day, seven days a week, 365 days a year. Some market sectors, including insurance, financial services, computer hardware and software, travel, books, music, video, flowers, and automobiles, are experiencing rapid growth in online sales. For example, in Jan. 1999, Dell Computer Corp. was selling an average of \$14 million of equipment online per day, and Amazon.com has become the third largest bookseller in the U.S., despite being in business only since 1995. With projections that the Internet will generate consumer and business-to-business sales in excess of \$294 billion by 2002, online retailing raises many questions about how to market on the Net. stated the importance of time consideration. In today's fast paced world, people are very time oriented and they may be concerned about potential risks of wasting time on learning how to use, getting used to, and troubleshooting a

new service. These time-conscious people are very likely will avoid the possible loss of time risk. Therefore, are less likely to adopt new service due the possibility of high switching, setup and maintenance costs.

Another dimension of risk is privacy risk. Privacy risk can be considered one of the most important dimensions in regard of cashierless store since it depends on all sorts of technologies, such as mobile payment, face recognition access control system. According to Featherman and Pavlou's [29] pilot test, people do concern about their private information being misuse by the company collecting it or stolen by identity theft. Jacoby and Kaplan [32] suggested that perceived risk should be considered as a multidimensional concept that includes different types of risks. In order to match our scenario, performance risk, time risk, and overall risk are used to measure perceived risk.

In the service quality literature, many studies show that service quality leads to perceived risk. For example, Chen and Dubinsky [33] stated that as service quality increases, uncertainty associated with product or service performance will decrease. In addition to this, Sweeney, Soutar, and Johnson [34] price and risk and willingness-to-buy. The results obtained have major implications for retailers as well as for future research in this strategically important area of consumer research.", "DOI": "10.1016/S0022-4359(99) founded that perceived risk can be reduced by offering quality in a retail environment. Customer who have positive service quality experience are less likely to be disappointed at product or service performance. Therefore, it follows that:

H1: Self-service technologies service quality in cashierless store is negatively related to perceived risk.

Perceived Benefit

The utility theory can provide a theoretical basis for value, and it is also the foundation of the modern microeconomic theory [35]. In other words, customers very often do not purchase products or services for their own benefit. When they purchase the product, they actually purchase a set of attributes that are valued based on the utility (benefits) provided by the combination of attributes minus the sacrifices [36]. That is to say, there is a tradeoff between all relevant benefit and costs or sacrifices delivered by a product or service and its use. Perceived benefits are a combination of different attributes of products, tangible and intangible, intrinsic and extrinsic, etc. This

combination of different attribute is available in relation to a particular buy and use situation [36]. In addition to this, Chandon, Wansink, and Laurent [37] defined that perceived benefit is belief in positive outcome which related to behavior.

Perceived benefits can be classified into two types: utilitarian (extrinsic) and hedonic (intrinsic) [38,39]. This classification can be applied to shopping since shopping provides utilitarian benefits, which by assisting customers to find their product efficiently and purchase it, and hedonic benefits, which by providing entertainment and increasing self-esteem [15]. In fact, Sheth [40] assumed that personal determinants of shopping in physical store can be understood as being influenced by functional (utilitarian) and nonfunctional (hedonic) motive. Benefits provided by cashierless store can also classified into utilitarian and hedonic. As utilitarian, cashierless store helps customer to maximize their utility, efficiency, and economy of their shopping. As hedonic, cashierless store provides intrinsic stimulation, fun, and self-esteem. These benefits will not be perceived by customers if SSTs do not provide decent service quality since perceived benefit is a tradeoff between benefit and cost or sacrifices.

We assume that customers' perceptions of shopping benefits in terms of convenience, cost reduction, and time saving increase when first, the SSTs are easy to be used, second, information about products and services can be found easily and quickly, third, SSTs can load information promptly and correctly, and fourth, the check-out processes can be accomplished easily and securely. As Fararah and Al-Swidi [41] and Akroush, Al-Debei, and Ashouri [42] suggested service quality has a positive significant effect on the perceived benefits. Therefore, it follows that:

H2: Self-service technologies service quality in cashierless store is positively related to perceived benefit.

Novelty

Tokunaga [43] explained that novelty "reflects the view of a technology as new, interesting, and identifiably different from others used or understood at the time of the introduction." Novelty is also defined as "the degree to which a user perceives an innovation to be a new and exciting alternative to an existing technology" [44].

According to Wells et al. [44], seminal psychology literature claims that the characteristics of novelty stimulates affective reaction. However, it can either be positive or negative. Moreover, researchers also found

that novel stimuli will cause strong arousal or emotion, which are highly affective reactions [45,46]. Novel stimuli can create a feeling of unfamiliarity and further inspire interest to the content [47,48]. However, as mentioned above, these kind of affective reactions can bring out different emotions, which can range from negative (fear) to positive (interest) [49]. For example, the newness of an innovation may create perceptions of uncertainty which stimulate fears, such as risk that associate with adoption [50]. On the other hand, novelty of an innovation may also create positive affective such as interest [51] and excitement [52]. Even though novelty may create either positive or negative affective reaction, the word “novelty” is generally associated with positive image [53]. We believe novelty, in this study, will bring positive affective reaction (fresh and exciting) rather than negative (scary and risky).

Novelty can provide an implication on how individuals perceive risk and benefit associated with IT innovation [44]. A research about RFID technology, which at that time is considered as IT innovation, showed that individuals will often make decision on whether adopt the technology or reject the technology based on their own risk and benefit equation [54]. The following research supported this statement. Lin and Yu [55] found that individuals who involve in novelty may “enlarge their perceived usefulness and playfulness (benefit) and underestimate their anxiety (risk)”. Novelty, in this study, is consider as an affective belief and we assume that individual will rely on emotional or experiential processing when adopting a IT innovation through assessing risk and benefit [44]. Using affective belief to help and affect decision making process is so called “affect heuristic” [56], and the affect heuristic stated that individuals with positive affective belief will minimize the risks while adopting products or technologies and vice versa [57]. As mentioned before, we believe novelty will bring positive affective belief. Thus, it follows that:

H3: Novelty of cashierless store is negatively related to perceived risk.

H4: Novelty of cashierless store is positively related to perceived benefit.

Social Presence

Since humans usually do treat systems and devices as social beings [58], a factor that make human to do this connection seems to be related to presence or more

specifically social presence [59]. Social presence was introduced by Short, Williams, and Christie [60] and they defined social presence as the level of a communication medium is perceived to deliver the presence of the communicating participants. In addition to this, Fulk, Steinfield, Schmitz, and Power [61]1978 defined social presence as “the extent to which a medium allows a user to experience others as being psychologically present.”

Social presence can, in fact, be viewed as an essential quality of a communication medium [62]. On the other hand, social presence is closely related to intimacy and psychological closeness when viewing from a psychological standpoint [60]. With this point of view, social presence is often used to measure perceived warmth, feeling of human contact, sociability, and sensitivity that reflect by a medium [63]. There are two research streams in regard to social presence. The first stream is on the technology-centric side. Researchers in this stream view computers/robots as having affective attributes which can replace human interaction by implementing verbal and non-verbal social cues. In other words, it can be related to the feeling of being accompanied by someone [64]. In this case, social presence is conceptualized as an overall assessment of the degree of human intimacy in the technology-based communication channel [65]. The other stream is focus on the information richness theory side [66] and is usually related to website. A website that can contain multimedia contents and socially rich text can deliver a sense of personal, sociable and sensitive human contact [62]. In other words, it is relate to the feeling of actually being in a virtual environment and can be defined as “a sense of being there”[67]even when one is physically situated in another.. In our context, the first stream of research is more relevant.

Since cashierless stores are unmanned, which means they do not facilitate direct interaction with service employee. However, it does not mean that cashierless store cannot deliver social presence. For example, adding social touch to the interaction can influence customers’ perceived social presence. This can be done by welcoming the customers by his/her name when he/she enters the store [68]. In the past research showed that social presence enhance purchase intention [68]. Hajli, Sims, Zadeh, and Richard [69] also found that social presence increased intentions to purchase. Moreover, social presence had also been found that it has influence on perceived usefulness, trust, enjoyment, attitude, and customer loyalty

[13,70]"page": "43-56", "volume": "19", "issue": "1", "source": "academic.oup.com", "abstract": "Abstract. Compared to offline shopping, the online shopping experience may be viewed as lacking human warmth and sociability as it is more impersonal, anonymous", "DOI": "10.1016/j.intcom.2006.07.010", "ISSN": "0953-5438", "journalAbbreviation": "Interact which is related to perceived risk and perceived benefit [71,72] despite its phenomenal growth and although M-Internet essentially provides the same services as stationary Internet, its adoption rate in many countries is very low compared to that of stationary Internet. The well-known Technology Adoption Model (TAM). Thus, in this study, we assume that social presence will influence customers' perceived risk and perceived benefit. Therefore, we hypothesize the following:

H5: Social presence in cashierless store is negatively related to perceived risk.

H6: Social presence in cashierless store is positively related to perceived benefit.

Repatronage Intention

Repatronage intention refers to customer's emotional attachment, which often show customer's attitude toward revisiting the particular store [73]. Repatronage intentions reveal the possibility that a customer will shop at a particular store again and again [74]. Featherman and Pavlou [29] stated that perceived risk will influence one's adoption decision when results of the decision create (a) feeling of uncertainty, (b) discomfort and/or anxiety [75], (c) conflict aroused in the consumer [76], (d) concern, (e) psychological discomfort [77], (f) making the consumer feel uncertain [78], (g) pain due to anxiety [79], and (h) cognitive dissonance [80,81] in a wide variety of contexts, the consequences of the existence of cognitive dissonance and the attempts on the part of humans to reduce it. . . . This book explores contexts ranging from individual decision situations to mass phenomena. Since reduction of dissonance is a basic process in humans, it is not surprising that its manifestations may be observed in such a wide variety of contexts. (PsycINFO Database Record (c. That is to say, when customers evaluate products or services before purchase and/or adoption, they will perceive risk consciously and unconsciously [27].

In fact, there are several consumer behavior literature shows that the risk facets can be used to understand

consumers' evaluations and purchases of a product and service [29]. Bobbitt and Dabholkar [82] showed that individual's attitude toward using a technology does influence by individual's perceived risk. In addition to this, Jarvenpaa, Tractinsky, and Vitale [83] also showed how perceived risk can negatively affect customers' attitude toward using online shopping. In both cases, perceived risk is seen as a cognitive belief that will bring negative consequences to technology adoption. By using cashierless store to shop also create uncertainties and possible negative outcome since it is considered as IT innovations. As Ajzen & Fishbein [84] proposed, the more positive an individual's attitude towards a particular behavior, the higher the behavioral intention will be and, vice versa. Therefore, it follows that:

H7: Perceived risk is negatively related to cashierless store's repatronage intention.

Perceived benefit can be used apply in shopping behavior and is individuals' perception of benefits that lead to satisfaction by participating in a particular shopping behavior [85]. In fact, customers incline to purchase and repurchase products or services that maximize their benefits [86]. Perceived benefits have been empirically shown to influence technology adoption [87]. The findings of Zheng et al. [88] showed that perceived benefit affects the adoption of e-business significantly. Furthermore, Beatty, Shim, and Jones [89] also found that perceived benefit has a positive effect on the adoption of corporate website. According to above two studies, it is reasonable to assume that perceived benefit will affect user attitude positively and their intention to repatronage cashierless store. Thus, it follows that:

H8: Perceived benefit is positively related to cashierless store's repatronage intention

Research Methods

Research Model

The purpose of this study is to explore the effect of SSTs service quality, novelty, and social presence on repatronage intention from the perspective of perceived risk and perceived benefit. We have found our research topic and developed hypotheses according to research background, motivation, and literature review. The research model of

this study is shown in Figure 1, including SSTs service quality, novelty, social presence, perceived risk, perceived benefit, and repatronage intention.

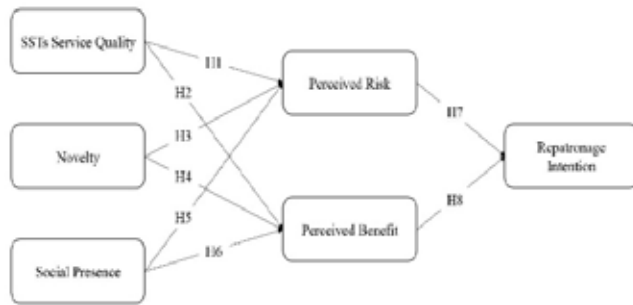


Figure 1 - Research Framework

Hypotheses

This study explore four parts: (1) the effect of SSTs service quality on the perception of risk and benefit, (2) the effect of novelty on the perception of risk and benefit, (3) the effect of social presence on the perception of risk and benefit, and (4) the effect of perceived risk and perceived benefit on repatronage intention. The proposed research hypotheses are organized and shown in Table 1.

Table 1 - Hypothesis Statements

Hypothesis	Hypothesis Statement
H1	SSTs service quality in cashierless store is negatively related to perceived risk.
H2	SSTs service quality in cashierless store is positively related to perceived benefit.
H3	Novelty of cashierless store is negatively related to perceived risk
H4	Novelty of cashierless store is positively related to perceived benefit.
H5	Social presence is negatively related to perceived risk.
H6	Social presence is positively related to perceived benefit.
H7	Perceived risk is negatively related to cashierless store's repatronage intention.
H8	Perceived benefit is positively related to cashierless store's repatronage intention.

Measurement of Constructs

This study is collected via an online questionnaire, which measured the constructs of SSTs service quality, novelty, social presence, perceived risk, perceived benefit, and repatronage intentions. Existing measures were used or modified to meet the purpose of this study wherever possible. Likert five-point scale was adopted to measure

each construct, with 1 being “strongly disagree”, 2 being “disagree”, 3 being “neutral”, 4 being “Agree”, and 5 being “strongly agree”. References of the measure of construct are shown in Table 2.

Table 2 - Reference Source for the Measure of Construct

Construct	Number of Items	Reference
SSTs Service Quality	15	Lin & Hsieh (2011)
Novelty	3	Wells, Campbell, Valacich, & Featherman (2010)
Social Presence	5	Gefen & Straub (1997)
Perceived Risk	8	Featherman & Pavlou (2003)
Perceived Benefit	5	Yiu, Grant, & Edgar (2007)
Repatronage Intention	6	Bhattacharjee (2001); Lee, Lee, & Fairhurst (2009); Žabkar, Brenčič, & Dmitrović (2010)2001; Lee, Lee, & Fairhurst, 2009; \\uc0\\u381{}abkar, Bren\\uc0\\u269{}i\\uc0\\u269{}, & Dmitrovi\\uc0\\u263{}, 2010

Sample and Data Collection

For the purpose of data collection, structured questionnaire was developed and distributed in Taiwan during the beginning of December 2018 to the beginning of January, 2019 through online and convenience sampling was used. Participants, who had shopping experience in convenience store type of cashierless store, were asked to complete the questionnaires anonymously. Questionnaire took about 5 minutes to finish, and a total of 304 responses were obtained. After controlling the missing values and eliminating 73 unqualified questionnaires, it yielded to 231 statistically usable questionnaire.

Data Analysis Method

Confirmatory factor analysis (CFA) was used to assess the reliability and the discriminant validity, concurrent validity, and convergence validity of the scales that measure the constructs. Structural equation modeling (SEM) [94] was conducted mainly to assess normlogical validity, and it combines regression and factor analyses to resolve general regression problems and the causal relationship between manifest and latent variables.

Data Analyses and Results

Descriptive Statistics

A total of 231 valid responses were used in the empirical analysis. These sample include diverse demographic backgrounds of respondents (gender: female, 48.1% and male, 51.9%; education level: high school, 8.2%, bachelor's degree, 55.4%, and master's or doctor's degree 36.4 %; age, under 25, 29.9%, 25-44 years, 54.5%, and above 45, 15.6%). Table 3 illustrates the descriptive statistics.

Table 3 - Frequency Distribution of Features of the Sample

Feature		Frequency	%
Number of Visit	1 st	124	53.7
	2 nd	48	20.8
	3 rd	23	10.0
	4 th or more	36	15.6
	Total	231	100
Alone/ Companion	Alone	122	52.8
	Companion	109	47.2
	Total	231	100.0
Amount of consumption	Below 100	122	52.8
	101~300	82	35.5
	301~500	24	10.4
	Above 501	3	1.3
	Total	231	100.0
Most impressed store	X-Store	87	37.7
	Bingo store	16	6.9
	iCarrefour	36	15.6
	Family technology concept store	70	30.3
	RT mini station	21	9.1
	Other	1	0.4
	Total	231	100.0
Gender	Male	120	51.9
	Female	111	48.1
	Total	231	100.0
Age	Under 17	1	0.4
	18 to 24	68	29.4
	25 to 34	76	32.9
	35 to 44	50	21.7
	45 to 54	20	8.7
	55 to 64	7	3.0
	Above 65	9	3.9
	Total	231	100.0

Education- al Level	High School	19	8.2
	Undergraduate	128	55.4
	Postgraduate	84	36.4
	Total	231	100.0
Marriage Status	Single	173	74.9
	Married	57	24.7
	Other	1	0.4
	Total	231	100.0
Current Job	Student	59	25.5
	Office worker	132	57.2
	Entrepreneur	9	3.9
	Govt. employee	14	6.1
	Homemaker/Re-tired	16	6.9
	Other	1	0.4
	Total	231	100.0
M o n t h - ly Salary (NT\$)	Under 20,000	57	24.7
	20,001~40,000	91	39.4
	40,001~60,000	46	19.9
	60,001~80,000	20	8.7
	80,001~100,000	11	4.8
	Above 100,001	6	2.6
	Total	231	100.0

Measurement Model

This study employed confirmatory factor analysis (CFA) through LISREL 8.80 to examine reliability, convergent validity, and discriminant validity. In order to purify the 42 items of the original measurement model, exhaustive checks were taken on each scale. Due to poor factor loadings or excessive cross-loadings, 13 items were eliminated since their loadings were lower than 0.5. The process of purifying scales produced 29 items, as shown in Table 4, which summarized the results of CFA for the measurement model on standardized factor loadings (>0.5), composite reliabilities (CR), average variances extracted (AVE), square root of average variance extracted and other appropriate data.

To check reliability, Cronbach's alpha was computed for each of these variables and their range are greater than 0.7 (0.74-0.90), which is above the general accepted minimum standards in research studies, and exceeds Nunnally's [95] recommended minimums. As presented in Table 4, the composite reliability of all constructs are greater than the recommended minimum of 0.60 (0.75-0.90) based on the suggestion of [96] in addition to the known problems

related to sample size and power, is that it may indicate an increasing correspondence between the hypothesized model and the observed data as both the measurement properties and the relationship between constructs decline. Further, and contrary to common assertion, the risk of making a Type II error can be substantial even when the sample size is large. Moreover, the present testing methods are unable to assess a model's explanatory power. To overcome these problems, the authors develop and apply a testing system based on measures of shared variance within the structural model, measurement model, and overall model. showing this measurement has good reliability. Each item loads significantly on its respective constructs ranging from 0.59 to 0.85 which demonstrates middle to high convergent validity [97].

Table 4 – Factor and Reliability Analyses

Con-struct	Item	Factor Load-ing	CR	AVE	Cronbach's α
S S T s Service Quality	SST1	0.81	0.89	0.54	0.89
	SST2	0.77			
	SST3	0.79			
	SST4	0.68			
	SST5	0.71			
	SST6	0.73			
	SST7	0.63			
Novelty	NVL1	0.79	0.75	0.51	0.74
	NVL2	0.74			
	NVL3	0.59			
Social Pres- ence	SP1	0.77	0.89	0.61	0.89
	SP2	0.68			
	SP3	0.81			
	SP4	0.85			
	SP5	0.79			
P e r - ceived Risk	PR1	0.75	0.87	0.57	0.87
	PR2	0.73			
	PR3	0.82			
	PR7	0.73			
	PR8	0.74			
P e r - ceived Benefit	PB1	0.74	0.76	0.51	0.76
	PB2	0.73			
	PB4	0.67			
Repa- tronage Inten- tion	RPI1	0.82	0.90	0.59	0.90
	RPI2	0.73			
	RPI3	0.79			
	RPI4	0.77			
	RPI5	0.72			
	RPI6	0.72			

CR: Composite Reliability; AVE: average variance extracted

The average variance extracted (AVE) estimates are greater than 0.5 and the results are satisfactory on all account [97]. Table 5 and 6 shows the means, standard deviations, and correlations among these variables. Correlations between the overall variables are significant at the 0.05 level (one-tailed). Furthermore, this study also confirms discriminant validity in terms of the square root of average variance extracted, which exceeds the off-diagonal correlation coefficients [96] in addition to the known problems related to sample size and power, is that it may indicate an increasing correspondence between the hypothesized model and the observed data as both the measurement properties and the relationship between constructs decline. Further, and contrary to common assertion, the risk of making a Type II error can be substantial even when the sample size is large. Moreover, the present testing methods are unable to assess a model's explanatory power. To overcome these problems, the authors develop and apply a testing system based on measures of shared variance within the structural model, measurement model, and overall model and the above items loading are significant ($p < .05$) and provide evidence of convergent validity. The confidence intervals do not include 1.0, which demonstrates discriminant validity support. In summary, all of the constructs achieve the criterion of discriminant validity.

Table 5 – Means and Standard Deviations

Variable	Mean	SD
1. SSTs Service Quality	3.90	0.60
2. Novelty	4.36	0.55
3. Social Presence	3.02	0.75
4. Perceived Risk	3.35	0.72
5. Perceived Benefit	3.86	0.67
6. Repatronage Intention	3.79	0.68

Table 6 – Correlations among the Analysis Variables

Vari- able	1	2	3	4	5	6
1	0.73					
2	0.49***	0.71				
3	0.31***	0.19**	0.78			
4	-0.34***	-0.15*	-0.20**	0.76		
5	0.66***	0.56***	0.38***	-0.23***	0.71	
6	0.61***	0.54***	0.48***	-0.26***	0.65***	0.77

Note: The square root of AVE is presented in bold on the diagonal of the table. ***: $p<0.001$; **: $p<0.01$; *: $p<0.05$

Additionally, this study used LISREL 8.80 to examine the measurement model. Table 7 listed goodness of fit statistics. Although both the goodness-of-fit index [GFI], and the adjusted-goodness-of-fit index [AGFI] showed poor fit (GFI=0.79; AGFI=0.74), the fit of the structural model was still acceptable, with Chi-square= 918.62, the d.f.=362, the Chi-square/d.f.=2.54; the normed-fit index [NFI]=0.92; the non-normed-fit index [NNFI]=0.94; the comparative-fit index [CFI]=0.95; the incremental-fit index [IFI]=0.95; the relative-fit index [RFI]=0.91; the root-mean-square residual [RMR]=0.04; the standardized-root-mean-square residual [SRMR]=0.06; the parsimony-goodness-of-fit Index [PGFI]=0.65, and the root-mean-square error of approximation [RMSEA]=0.08.

Table 7 – Goodness of Fit Statistics

Model-fit Statistics	Value of Model	Critical Value of Goodness-of-Fit
d.f.	362.00	
χ^2	918.62	
$\chi^2/d.f.$	2.54	≤ 3.00 [98]
RMSEA	0.08	≤ 0.08 [99]"container-title":"Psychological methods","page":"64-82","volume":"7","source":"ResearchGate","abstract":"Principles for reporting analyses using structural equation modeling are reviewed, with the goal of supplying readers with complete and accurate information. It is recommended that every report give a detailed justification of the model used, along with plausible alternatives and an account of identifiability. Non-normality and missing data problems should also be addressed. A complete set of parameters and their standard errors is desirable, and it will often be convenient to supply the correlation matrix and discrepancies, as well as goodness-of-fit indices, so that readers can exercise independent critical judgment. A survey of fairly representative studies compares recent practice with the principles of reporting recommended here.
NFI	0.92	≥ 0.90 [100]
NNFI	0.94	≥ 0.90 [100]
CFI	0.95	≥ 0.95 [101,102]
IFI	0.95	≥ 0.90 [103]
RFI	0.91	≥ 0.90 [104]
RMR	0.04	≤ 0.05 [103]
SRMR	0.06	≤ 0.08 [102]
GFI	0.79	≥ 0.90 [102,105]

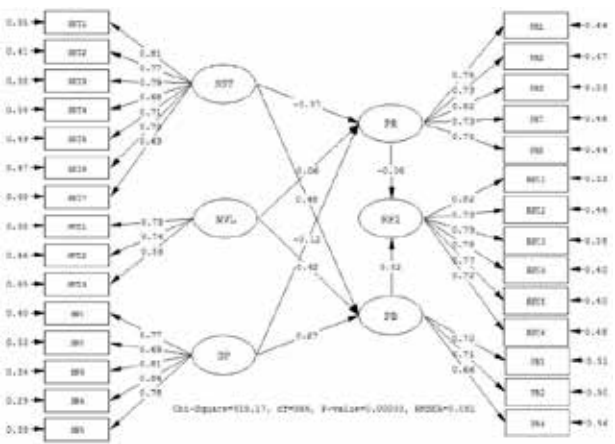


Figure 2 - The Structural Path Model's Estimates

First, SSTs service quality affects both perceived risk ($\beta=-0.37$, $p<0.001$) and perceived benefit ($\beta=0.48$, $p<0.001$). On the other hand, novelty only affects perceived benefit ($\beta=0.42$, $p<0.001$) but not perceived risk ($\beta=0.06$, $p>0.1$). Moreover, social presence affects both perceived risk ($\beta=-0.12$, $p<0.1$) and perceived benefit ($\beta=0.27$, $p<0.001$). Secondly, perceived risk does not affect repatronage intention ($\beta=-0.06$, $p>0.1$). Lastly, perceived benefit affects repatronage intention ($\beta=0.82$, $p<0.001$). Table 8 presents the structural model estimates.

Table 8 – Structural Model Estimates

Hypothesized Path		β	t-value
SSTs Service Quality →			
Perceived Risk	H1	-0.37	-3.66***
SSTs Service Quality →			
Perceived Benefit	H2	0.48	6.06***
Novelty → Perceived Risk	H3	0.06	0.58
Novelty → Perceived Benefit	H4	0.42	5.19***
Social Presence → Perceived Risk	H5	-0.12	-1.63†
Social Presence → Perceived Benefit	H6	0.27	4.82***
Perceived Risk →			
Repatronage Intention	H7	-0.06	-1.02
Perceived Benefit →			
Repatronage Intention	H8	0.82	9.50***

β : Standardized Parameter

†: $p<0.1$; *: $p<0.05$; **: $p<0.01$; ***: $p<0.001$

Result

Table 9 lists hypothesis statements and the results. The findings of this study provide evidence that the effects between self-service technologies service quality, novelty, social presence, perceived risk, perceived benefit, and repatronage intention.

Hypothesis	Hypothesis Statement	Results
H1	SSTs service quality in cashierless store is negatively related to perceived risk.	Supported
H2	SSTs service quality in cashierless store is positively related to perceived benefit.	Supported
H3	Novelty of cashierless store is negatively related to perceived risk.	Not Supported
H4	Novelty of cashierless store is positively related to perceived benefit.	Supported
H5	Social presence in cashierless store is negatively related to perceived risk.	Supported
H6	Social presence in cashierless store is positively related to perceived benefit.	Supported
H7	Perceived risk is negatively related to cashierless store's repatronage intention.	Not Supported
H8	Perceived benefit is positively related to cashierless store's repatronage intention.	Supported

Discussion and Conclusion

Discussion

Firstly, the finding support a negative linkage between SSTs service quality and perceived risk (H1) and a positive linkage between SSTs service quality and perceived benefit (H2). Moreover, the finding support a positive linkage between novelty and perceived benefit (H4). However, it does not support a negative linkage between novelty and perceived risk (H3). The finding support a negative linkage between social presence and perceived risk (H5) and a positive linkage between social presence and perceived benefit (H6). Lastly, the finding also support a positive linkage between perceived benefit and repatronage intention (H8), but do not support a negative linkage between perceived risk and repatronage intention (H7).

Regard to H1, the result of this study is consistent with the studies conducted by Chen and Dubinsky [33] and Sweeney et al. [34] price and risk and willingness-to-buy. The results obtained have major implications for retailers as well as for future research in this strategically important area of consumer research.", "DOI": "10.1016/S0022-4359(99, suggesting that with higher service quality will lead to lower perceived risk. Regard to H2, the result of this study is consistent with the study conducted by Fararah and Al-Swidi [41]. Regard to H4, the result of this study is consistent with Wells et al.'s study [44]. Regard to H5 and H6, the result of this study is consistent with these previous studies "Electronic commerce typically lacks human warmth and sociability, since it is more impersonal, anonymous and automated than traditional face-to-face commerce. This paper explores how human warmth and sociability can be integrated through the web interface to positively impact consumer attitudes towards online shopping. An empirical study was undertaken to investigate the impact of various levels of socially rich text and picture design elements on the perception of online social presence and its subsequent effect on antecedents of attitudes towards websites. Higher levels of perceived social presence are shown to positively impact the perceived usefulness, trust and enjoyment of shopping websites, leading to more favourable consumer attitudes. Implications of these finding for practitioners and future research are outlined." Social Comparison, Social Presence, and Enjoyment in the Acceptance of Social Shopping Websites", "container-title": "Journal of Electronic Commerce search", "With businesses seeking to seize the momentum of social media and social networking, technology-enabled social commerce has emerged to combine the power of online social networking with shopping. This study examines an emerging area in E-commerce, i.e., social commerce. Extending the online consumer behavior typology, this study categorizes online consumer behaviors into three types: transactional, informational, and social. While traditional E-commerce supports the transactional and informational aspects of online shopping, social commerce fulfils the social aspects of shopping, and potentially enhances the informational aspect as well. This research examines the online shopper as a prospective user of an emerging social commerce platform, the social shopping website, which are sites designed specifically to support social interactions while online consumers shop. The study augments the Technology Acceptance Model with

constructs that enhance the specificity of the model to the social shopping application of social commerce. The model was empirically tested and supported. The results provide empirical evidence to support the importance of distinguishing the social aspect of shopping from the information and transactional aspects, as well as the potential advantage to using technology to promote social interactions on E-commerce sites. Implications and future research are discussed.", "journalAbbreviation": "Journal of Electronic Commerce Research", "author": as well as the view of Gefen and Straub [68]. Regarding H6, the result of this study is consistent with the studies conducted by Tezcan and Akturan [108] and Lee [109]. Both identify the positive relationship between perceived benefit and repatronage intention.

However, the result of H3 is not consistent with previous study [44]. A possible explanation for this is innovations are inherently risky, and although the potential benefits of adoption may be recognized by all adopters, but there is no guarantee that adoption will produce the anticipated outcome [110] some questions with regard to both the antecedents as well as the consequents of perceptions remain unanswered. This paper reports the results of a field study examining adoption of an information technology innovation represented by an expert systems application. Two research objectives that have both theoretical and practical relevance motivated and guided the study. One, the study challenges an assumption which is implicit in technology acceptance models: that of the non-existence of moderating influences on the relationship between perceptions and adoption decisions. Specifically, the study examines the effects of an important moderating influence – personal innovativeness – on this relationship. Two, the study seeks to shed further light on the determinants of perceptions by examining the relative efficacy of mass media and interpersonal communication channels in facilitating perception development. Theoretical and practical implications that follow from the results are discussed.", "DOI": "10.1016/S0167-9236(97. For those who adopt innovation, they may have risk taking propensity. According to Rogers [10], these people can be considered as innovators, which mean they are fully aware the uncertainty they are facing and have low perception of risk. Since cashierless store in Taiwan currently only open for less than a year, it still can be considered as IT innovation. In other words, for those who have experienced cashierless store, our respondents, are considered as innovators. Therefore, our H3 did not get supported.

The result of H7 is also not consistent with previous studies [111,112], as well as the views of Chiu, Wang, Fang, and Huang [113] that once consumers have learned that a service or product could produce negative consequences, they will avoid those negative consequences by ceasing. A possible explanation for this is most of our respondent are below 34 years old, in other words, they grew up in an environment full of information technology, a digital age, so they are familiar with the use and the operation of information technology. According to Prensky [114], they are so called “digital native”. They are exposed to digital technology and digital culture from birth. Therefore, they are used to using technology. As a result, they may be less concern with risk associated with using cashierless store. Hence, our H7 did not get supported.

Implication

For practitioners, the finding of this study suggest that customers’ perceived benefit has an important role on repatronage intention. Therefore, we suggest practitioners focus on improving customers’ perceived benefit rather than perceived risk. First of all, SSTs service quality has an important role on perceived benefit. Therefore, we suggest that practitioners to upgrade their self-service technologies’ stability continually and provide clear privacy policy in order to increase self-service technologies service quality. Furthermore, practitioners can also provide clear and easy to understand of “How to Use” instruction, comfortable shopping environment, and variety of product at lower price to customer in order to increase customer’s perceived benefit. In addition, it is important for practitioners of cashierless store to investigate their customers’ experience and evaluation of their SSTs continually and identify what other factors will affect customer perceived benefit. Secondly, novelty has influence on perceived benefit. Practitioners should also continue to keep their cashierless store “novel”, which means new and refreshing [44], in order to give customers affective belief and increase their perceived benefit. Last but not least, social presence affects both perceived risk and perceived benefit, hence, practitioners have to pay attention to it. We suggest practitioners invest in creating and maintaining effective social presence channels with customers, such as applying verbal or nonverbal social cues in their store in order to create a sense of human contact, warmth and sociability.

Limitations of the Study

It should be noted that this study has certain limitations. Since the cashierless stores in Taiwan have only started to operate less than a year ago, and there is only small number of cashierless store, it raises difficulties of collecting questionnaire. As a result, we are unable to collect large number of questionnaire. This may lead to bias in our study's result. Furthermore, it was a convenient sample collected from North Taiwan only due to cashierless store currently only operate at North Taiwan. In addition to this, the model was tested only with the data collected from Chinese culture. Therefore, the generalizability of this study to the entire population may be limited. Further exploration and validation may be needed.

Suggestions for Future Research

In this study, we only focused on convenience store type of cashierless store. However, there are more and more supermarket company also started to implement their supermarket type of cashierless store [115]. Future studies can examine the different factors that will affect repatronage intention between convenience store type and supermarket type. In addition to this, we focused on the effect of SSTs service quality, novelty, and social presence on perceived risk and perceived benefit. However, it must be acknowledged that other factors may also affect perceived risk and perceived benefit. Store atmosphere may also be one of it since the store is cashierless, in other words, unmanned. By creating a nice store atmosphere may also has effect on customers' perceived risk and perceived benefit. Furthermore, cross analysis of age on the effect of perceived risk on repatronage intention could also be a possible future research. Last but not least, we recommend that future researches can expand sample size or involve the use of diversified sample to improve the findings of this study.

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Toward an Understanding of Mobile Banking Adoption

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Abstract

With the proliferation of smart devices, mobile banking has become increasingly important. Customers can manage their banking needs without desktop computers or a face-to-face meeting with bank tellers. However, contrary to expectation of wide-spread use of mobile banking, several factors restrict its adoption. The purpose of this study is to explore what factors affect positively or negatively the adoption of mobile banking from economic (operational competence, convenience, mental accounting), psychological (hope, self-efficacy, optimism, resiliency) and social perspectives (normative social pressure, embarrassment avoidance). This paper suggests that three enablers would consequently affect a customer's perceived utilitarian and hedonic value in mobile banking, followed by trust and intention to use. In testing the hypothesized research model, survey and analysis of a structural equation model using Amos are conducted. The findings emphasize that banks need to focus on perceived utilitarian and hedonic values when considering economic, psychological and social enablers most salient to customers in order to promote greater adoption of mobile banking services.

Keywords

Mobile banking, Economic-Psychological-Social enabler, Utilitarian value, Hedonic value, Trust.

Introduction

FinTech is the short form of the phrase financial technology, denoting companies or representatives of companies that combine financial services with modern, innovative technologies (Kawai, 2016). According to a survey by the Korea Internet & Security Agency (2018), mobile banking (e.g., P2P lending, payment, and billing) of all FinTech services has the highest rate of use (38.2%) compared to other services. Shareef, Baabdullah, Dutta, Kumar & Dwivedi (2018) defines mobile banking as “a specific type, as well as an extension of certain functional features, of Internet banking where consumers can seek different kinds of financial services from banks through the use of a mobile device under the wireless application protocol (WAP)” (p.54). The spread of mobile phones and tablets has increased the demand for mobile banking services. Compared to traditional offline banking, mobile banking provides anytime, anywhere accessibility and flexibility. With greater acceptability over time, mobile

banking is expected to replace offline banking. However, the current use of mobile devices to conduct banking transactions is less widespread than anticipated (Shaikh & Karajaluoto, 2015). Many mobile banking adopters use it only to check account balances or pay a small sum of money (Malaquias, Malaquias & Hwang, 2018). Due to the low level of adoption, researchers need to understand which elements of mobile banking add value from a customer's perspective (Verissimo, 2016).

Previous research considered mobile banking as innovative information technology (IT) and explored enablers affecting mobile banking adoption based on innovative IT adoption models, such as the technology acceptance model (TAM) (Davis, 1977), theory of reasoned action (TRA) (Fishbein & Ajzen, 1977) or theory of planned behaviour (TPB) (Ajzen, 1985). The list of enablers of mobile banking adoption in the literature include perceived ease of use (PEU), perceived usefulness (PU), social influence, such as subjective norm, self-efficacy,

perceived behavioral control like internal and external constraints and compatibility (Malaquias et al., 2018; Shareef et al., 2018; Veríssimo, 2016; Choudrie, Junior, McKenna & Richter, 2018; Mehrad & Mohammadi, 2017; Baptista & Oliveira, 2015; Konana & Balasubramanian, 2005). Furthermore, numerous studies have examined the enabler led by IT product characteristics (Rao & Lynch, 1993). While research into the enablers and implications of IT adoption under various conditions has steadily progressed, it has been argued that IT artifacts are either absent, black-boxed, abstracted from social life or reduced to surrogate measures. Konana and Balasubramanian (2005) suggest a multidisciplinary approach, paying particular attention to economic, social and individual psychological aspects of mobile banking adoption. The IT adoption models discussed above have empirically verified the effect of enablers: self-efficacy, PEU and PU from a psychological perspective (Veríssimo, 2016); subjective norm and external behavioral constraints from a social perspective (Malaquias et al., 2018); and convenience from an economic value perspective generated through IT characteristics (Konana & Balasubramanian, 2005).

Although strong arguments have been addressed, it seems to be a lack of consideration of the unique IT characteristics of mobile banking, as well as a limit to understanding enablers in the multidisciplinary viewpoint because the enablers affecting mobile banking adoption are randomly selected. This study is based on previous literature and attempts to classify enablers of mobile banking adoption into economic, psychological and social factors. In addition, the current study suggests the mediators of utilitarian / hedonic value and trust in the relationship between enablers of mobile banking and intention to use. Kim, Park, Kim & Lee (2014) divide mobile applications (apps) into utilitarian and hedonic apps. Generally, products with utilitarian benefits are mainly instrumental and functional while those with hedonic benefits are related to experiences, fun, pleasure and excitement. Mobile banking has been classified as a typical utilitarian app because it is used with rationality rather than emotional reason (Kim et al., 2014). However, it is increasingly argued that various mobile banking services of the do-it-yourself type can give not only utilitarian but also hedonic gains to customers. For example, Konana and Balasubramanian (2005) propose that online trading on mobile banking can yield hedonic value. Online traders making their own decisions in

buying and selling stocks can have fun in the trading process and even feel legitimate gambling experiences. They can also achieve utilitarian gains through increased control in online trading. Accordingly, as mobile banking allows customers to search for and choose financial products to meet their preferences for interest rates or payment installment methods, they can enjoy hedonic gains in the process.

This study uses these insights to suggest a research model hypothesizing the interrelationships between enablers of mobile banking adoption, utilitarian and hedonic value, trust and intention to use. This paper answers the following questions based on this objective: 1) do three enablers (economic, psychological, social aspects) positively affect utilitarian and hedonic value; 2) does utilitarian and hedonic value positively affect trust; and 3) does trust positively affect intention to use of mobile banking.

Literature Review

Utilitarian and hedonic value

Shopping values are derived from customer experience in what is received in benefits and what is given up to acquire those benefits, such as prices or sacrifices (Dlodlo, 2014). If the differences are trivial, customer preference will create future business opportunities from customer loyalty. Shopping values are one of the most powerful ways in the retail channel to understand customer behavior (Zeithmal, Parasuraman & Malhotra, 2002). Marketing research classifies shopping values into utilitarian and hedonic values. Utilitarian values are based on rational judgement and have the task-related meaning that a product is purchased efficiently for functional shopping goals (Babin, Darden & Griffin, 1990). Hedonic values, on the other hand, are obtained when a customer experiences enjoyment and pleasure through shopping (Zeithmal et al., 2002).

Despite the importance of customer experience of business performance, little attention has been given to customer experience in technological development. This results from customer interaction with technology services (Rose, Clark, Samouel & Hair, 2012). Several previous works have sought to understand customer experiences in IT-related services (Jamshidi, Keshavarz, Kazemi & Mohammadian; Kim et al., 2014; Hu, Kim & Kim, 2013; Ankar & D'Incau, 2002). In common with shopping value, mobile customers also obtain mobile

value through the use of mobile app services (Kim et al., 2014). Anckar and D’Incau (2002) identify mobile value based on distinctive features of mobile technology as ubiquity, time-criticality, spontaneity, accessibility, convenience, localization and personalization. On the other hand, different researchers have expressed mobile value in terms of the experience by customers of the motivations for consumption (Park, 2006), i.e., utilitarian and hedonic value (Jamshidi et al., 2018; Kim et al., 2014; Hur, Kim & Kim, 2012; Park, 2006).

Utilitarian value is composed of the motivation of a goal-oriented service use, such as price, ease of use and service offering comparison. Hedonic value comprises motivation, such as experiential, fun, enjoyable and visually appealing (Kim et al., 2014; Jamshidi et al., 2018). Some research has assumed that mobile services belong to the utilitarian app category (Kim et al., 2014; Kleijinen, De Ruyter & Wetzels, 2007), while others have argued that mobile banking customers may consider hedonic value, as well as utilitarian value (Jamshidi et al., 2018; Konana & Balasubramanian, 2005). Jamshidi et al. (2018) notes that feelings, such as fantasy, happiness or enjoyment, can be reasons why people use mobile banking. As the unique features of mobile banking have shifted from static to more interactive components, the importance of hedonic value has increased. Therefore, this study explores utilitarian and hedonic value of mobile banking.

Enablers of mobile banking

The development of mobile technologies and devices has led to change in the financial sector. Mobile banking enables people to conduct banking transactions with mobile apps. However, contrary to expectations, the adoption rate of mobile banking is still low, leading researchers to try to identify the enablers of mobile banking adoption. As Dineshwar and Steven (2013) indicate, the use of mobile banking to access financial information and conduct transactions is not as widespread as expected. This situation evoked a need to explore what the enablers of mobile banking acceptance and continues usage. Numerous enablers based on innovative IT adoption models such as TAM and Unified Theory for the Acceptance and Use of Technology (UTAUT) have been suggested and empirically investigated (see Table 1).

Table 1. Previous research on enablers of mobile banking adoption

Authors	Enablers of mobile banking adoption
Malaquias et al. (2018)	task activities, trust in mobile banking, ease of use, social influence, perceived innovativeness
Shareef et al. (2018)	attitude to use, ability to use, assurance to use, adherence to use
Choudire et al. (2018)	trust, service quality, compatibility, UTAUT (performance expectancy, effort expectancy, facilitating condition, social influence)
Mehrad et al. (2017)	word-of-mouth, social norms, trust, PU, PEU
Verissimo (2016)	perceived risk, PEU, PU, compatibility, age, income
Baptista & Oliveira (2015)	UTAUT variables (performance expectancy, effort expectancy, facilitating condition, hedonic motivations, price value, habit)
Jeong & Yoon (2013)	PEU, PU, perceived credibility, perceived self-efficacy, perceived financial cost
Al-Jabri & Sohail (2012)	relative advantage, complexity, compatibility, observability, trialability, perceived risk
Püschel et al. (2010)	relative advantage, compatibility, image, result demonstrability, trialability, visibility, PEU, self-efficacy, resource facilitating condition, technology facilitating condition, subjective norm

Despite rigorously examining the concept of enablers in the literature, there are evident limitations in reflecting unique characteristics of mobile banking and identifying causal interrelationships. Reflecting on the unique properties of mobile banking, consideration is required of the new functions of mobile banking. Mobile banking provides similar financial services to offline banking but mobile banking can also be used as a convenient communication tool rather than solely a financial lending or depositing service for customers in their teens and twenties. After spending money in social media sites, the expenditure can then be divided evenly and transferred easily using individual identification from social network services without any inconvenient transfer process. If a customer

does not use mobile banking, they may be embarrassed or feel out of date among their peers. Thus, there are an increasing number of reasons to use mobile banking. In order to identify which enablers most affect the adoption of mobile banking as an innovative IT, it is necessary to expand previous IT adoption models by identifying new trending characteristics of mobile banking.

Previous research has tended to identify various enablers as having the same impact on IT adoption. Social influence and hedonic motivation equally affect intention to use mobile banking (Baptista & Oliveira, 2015). However, there may exist a causal relationship between social influence and hedonic motivation. If a referent who has some power by virtue of specific status recommends online trading to others, once the others start trading, the referent may achieve a greater enjoyment from the online trading. People may feel they belong to a particular group through using mobile banking. From this perspective, the interrelationships among enablers can be identified. The socio-economic-psychological model of technology adoption of Konana and Balasubramanian (2005) is especially useful in this regard. They posit the enablers of mobile banking adoption are divided into economic, psychological and social factors based on the difference between utilitarian and hedonic values.

Research Model and Hypotheses

A customer's perceived utilitarian and hedonic value toward mobile banking is affected by three economic (operational competence, convenience, mental accounting), psychological (hope, self-efficacy, optimism, resiliency) and social enablers (normative social pressure, embarrassment avoidance). A customer's trust toward mobile banking is also positively affected by utilitarian and hedonic IT value. Furthermore, trust in mobile banking has an effect on intention to use.

Economic enablers and utilitarian value

Hypothesis 1: Economic enabler of mobile banking is positively related to utilitarian value.

Psychological enablers and utilitarian / hedonic values

H2. Psychological enabler of mobile banking is negatively related to utilitarian value.

H3. Psychological enabler of mobile banking is positively related to hedonic value.

Social enablers and utilitarian gains

H4. Social enabler of mobile banking is positively related to hedonic value.

Utilitarian / hedonic values and trust

H5. Perceived utilitarian value toward mobile banking will positively affect trust.

H6. Perceived hedonic value toward mobile banking will positively affect trust.

Trust and intention to use

H7. Customers' trust in mobile banking will positively affect actual usage.

Research Methodology

The target respondents of this research were customers over 19 years old who have used mobile banking in the three months preceding the survey. Once a research instrument was developed with multiple-item scales for various levels of interest, a total of 300 questionnaires with a 5-point Likert scale were distributed. A total of 247 were returned and usable, representing a response rate of 82.3%. Most of the measurement items relating to mobile banking enablers (economic, psychological social factor), utilitarian and hedonic value, trust and intention to use were taken from relevant studies.

First, economic factor consists of *operational competence* (e.g., "Mobile banking service provides current and correct information related to transactions"), *convenience* (e.g., "Mobile banking service channel is available at any time"), and *mental accounting* (e.g., "I evaluate the gains and losses related to using mobile banking services"), which of them is measured with 3 items (Konana & Balasubramanian, 2005). Second, with regard to psychological factor, each construct of *hope* ("I will seek ways to successively perform my transactions in mobile banking") (Jeong & Chung, 2017), *self-efficacy* (e.g., "I have skills in using mobile banking service channel") (Shareef et al., 2018), *optimism* ("I always think positively with regard to my mobile banking transactions") (Jeong & Chung, 2017), and *resilience* (e.g., "I can overcome difficulties in relation with my transactions in mobile banking") (Jeong & Chung, 2017) uses three indicators. Next, social factor is composed of *normative social pressure* (e.g., "The people that influence my behavior that I should use mobile banking") (Malaquias et al., 2018) and *embarrassment avoidance* (e.g., "I prefer privately handle

my transaction in mobile banking without the intervention of bank teller”) with 3 items (Konana & Balasubramanian, 2005), respectively. Three items measure *utilitarian* (e.g., “Mobile banking services are a good value for the money”) and *hedonic value* (e.g., “Using mobile banking services is fun”) (Baptista & Oliveira, 2015), respectively. *Trust* (e.g., “Mobile banking seems *reliable*”) is measured with three indicators (Jamshidi et al., 2018). Finally, two items measure *intention to use* (e.g., “I will always try to use mobile banking services”) (Jamshidi et al., 2018).

Results

Unidimensionality

To assess unidimensionality, internal consistency and confirmatory factor analyses were performed. A reliability test was used to purify the measurement scale for each construct. All coefficient alphas of the seven constructs reported surpassed .70 criteria for reliability acceptance. To examine an acceptable fit of the employed measurement model, each construct was evaluated by examining the statistical significance of its estimated loading and the overall model fit. All loadings exceeded .72 and each indicator t-value exceeded 12.62 ($p < .001$). The other statistics set out also supported the overall measurement quality. To assess discriminant validity, the square root of the average variance (AVE) between a construct and its measures was used. The AVE was over .50, indicating adequate discriminant validity.

Hypotheses testing

Using IBM SPSS AMOS 22.0, a structural equation model is employed to test the hypothesized model. The hypothesized model shows a good fit to the data ($\chi^2 = 258.31$, $df = 111$ ($p < .001$); TLI = .93; CFI = .94; RMSEA = 0.07). In the relationships between enablers and utilitarian and hedonic values, the effects of economic (H1. $\beta = 0.34$, $p < .001$) and psychological factor on utilitarian value (H2. $\beta = -.69$, $p < .001$) were significant. In addition, social factor has a significant effect on hedonic value (H4. $\beta = .61$, $p < .001$). However, contrary to expectation, the relationship between psychological factors and hedonic values were not significant and therefore H3 was rejected. H5 addressed the positive relationship between utilitarian value and trust in mobile banking. The effect of utilitarian value ($\beta = .67$, $p < .001$) was significant but H6 on the relationship between hedonic value and trust was rejected. Trust in mobile banking has a significant effect on intention to use ($\beta = .81$, $p < .001$). Thus, H7 was also confirmed by the data.

Conclusions

Focusing on the context of mobile banking led to various hypotheses related to enablers of the adoption of mobile banking from the economic, psychological and social aspects. These enablers affected customer perception of utilitarian and hedonic values and trust toward intention to use.

Test results showed that an economic enabler positively affected utilitarian value. The service provider’s operational competence to offer effective mobile banking services, convenience to use anytime and anywhere and relative advantage of mobile banking in preference to traditional offline banking services had a positive effect on customer’s perceived utilitarian value.

The results also found that a customer’s perceived psychological factor on mobile banking had a negative effect on utilitarian value. Customers with high self-efficacy from attributes, such as such as digital literacy, seemed more easily to conduct mobile banking transactions without any difficulty. Although they had some problems, they were able to solve such problems by themselves. For them, the relationship between psychological enablers and utilitarian value was negative. This type of customer was expected to focus on hedonic rather than utilitarian value. However, H3 on the relationship between psychological enabler and hedonic value was rejected. The plausible reason was that hedonic value in mobile banking was not perceived to be important for customers with high self-efficacy because they tend to be comfortable performing traditional banking tasks rather than using mobile banking to maintain social relationship for pleasure.

Conversely, social factor positively affected hedonic value. It would appear many people prefer to handle certain tasks through mobile banking without face-to-face contact. Customers gain a feeling of comfort and fun from using mobile banking services. The relationship between utilitarian and hedonic value and trust in mobile banking tested in H5 on the effect of hedonic value on trust was not supported. Customers cognitively have trust when mobile banking provides lower service fee or convenient access rather than offline banking service. In other words, only affective and emotional reason that services are fun or entertaining does not make customer have trust, followed by intention to use.

There are a few lines of enquiry thrown up by this paper requiring further exploration and future research. As

Konana and Balasubramanian (2015) noted earlier, the economic-psychological-social model can be applied, with due adjustments, to other mobile banking contexts. The enablers discussed here would not be equally relevant within other service contexts. Future works may consider the characteristics of distinct contexts. Therefore, future studies can compare the effect of enablers among different mobile banking types.

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The Effect of E-Learning Actual Use on the Net Benefit among Public Universities Students in Nepal

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Abstract

E-learning is on the rise growing rapidly because it offers clear advantages over conventional or traditional learning. The fastest and easiest learning experience is the need for time. In recent years, e-learning has been the subject of many innovations and its benefits are expected to improve each year. More and more students should have access to e-learning programs that take their learning experience to a whole new level. The main issue is the lack of researches that focus on measuring the actual use and the net benefit of these kinds of technology in Nepal. The main aim of the current study is to test the actual use factor on the net benefit factor. To achieve this aim of this study, the questionnaire was utilized to collect data from the population of public universities students in Nepal by using probability random sampling. To test the research model, the Structural Equation Modeling-Variance Based (SEM-VB) has been utilized, by harnessing the SmartPLS 3.0 software. The result from the analysis shed lights on the impact the actual use factor on the net benefit factor. The proposed research model explained 32% actual use (AU). actual use (AU) had a positive direct effect on the net benefit (NB) within the public university's students in Nepal. The results of the current study have the potential to give further insights into the e-learning general policies and nation strategies.

Keywords

E-Learning, Actual Use, Net Benefit

1. Introduction

E-learning is no longer an alternative technique of daily teaching, but rather an urgent necessity, especially in light of the Fourth Industrial Revolution (IR 4.0). This revolution works to harness digital technologies in all the details of daily life. Artificial Intelligence and the Big Data as well as the internet of things. E-learning is not in isolation from this and that. E-learning is not a new concept, but many people do not realize its impact on educational programs. Because education aims to develop life, e-learning is an advantage that can enhance improvements in knowledge and innovation. E-learning includes online courses, tutorials and everything available in digital formats over the Internet or offline [1]–[4] there is limited evidence on how institutions can be strengthened. Evaluating the effects of specific reforms is complicated by the lack of exogenous variation in institutions, the difficulty of measuring institutional performance, and the temptation to “cherry pick” estimates from among the large number of indicators required to capture this multifaceted subject. We evaluate one attempt to make

local institutions more democratic and egalitarian by imposing participation requirements for marginalized groups (including women. Ranging from simple digital books to printed programs, to web-based symposia, to the use of enhanced reality [5]–[8].

In recent years, digital development has become a determining factor in the selection of future jobs requiring skills to cope with the Fourth Industrial Revolution, called 21st century skills. In order to prepare a generation capable of keeping pace with developments in various fields, it is necessary to work hard to improve the learning environment and develop their systems, and to present ideas that contribute to the culture of the Innovation community, change and development in schools and colleges [5], [8]–[14].

In spite of the fact that various studies have researched the effect of pioneers on creativity, these studies have to a great extent concentrated on issues of leader support. In spite of the fact that various studies have researched the effect of Actual use of e-learning, these studies have to a great

extent concentrated on issues of net benefits (Mohammedi 2015; Khasawneh 2015; Freeze, Alshare, Lane, and Joseph Wen 2010; Sun, Tsai, Finger, Chen, et al. 2008; Sommer n.d.; Aparicio, Bacao, and Oliveira 2017; Nations and On 2008; With) the development of ICT strategy is vital for the growth of the knowledge economy in developing countries. Information and Communication Technology (ICT).

As a practical translation, this study tested the theory, as the main object, on the relationship between the actual user and net benefits, including many important interrelated factors. The main objective of this research is to examine the impact of actual use of e-eLearning on the net benefits within the in the privets universities sector in the Nepal.

2. Literature Review

2.1 Actual Usage (USE)

Actual usage is defined as the degree and manner in which users utilize the capabilities of an information system. For example, amount of use, frequency of use, nature of use, appropriateness of use, extent of use, and purpose of use (DeLone & McLean, 2016). Actual usage is considered as one of the core constructs in the IS field, literature is full of studies where actual usage is used in numerous contexts and applications because it is the ultimate goal of any technology or application. In a study about information systems in Mexico by Abrego-Almazán et al. (2017) and after analysing data collected from 133 users using SEM-PLS, it was found that use construct has a positive significant relationship with organizational results. Actual usage is mainly measured using a different method like Likert scale and other types of scales as well. The most used indicators are frequency and time length (Mohammedi, 2015).

2.2 Net Benefit (NB)

Net benefits is defined as the extent to which information systems are contributing to the success of individuals, groups, organizations, industries, and nations, for example, improved decision-making, greater productivity, increased sales, cost reductions, better profits, greater market efficiency, heightened consumer welfare, job creation, and economic development [23]. There are few notable studies which focus on performance or net benefits as an output variable in the context of IS (Hou, 2012; Norzaiddi & Salwani, 2009; Son et al., 2012). In this study, net benefits is defined as the degree to which the system usage

effect the knowledge acquisition, communication quality and decision quality (Princely, 2014; Khayun & Ractham, 2011) Perceptions of Information Quality, Perceptions of System Quality, and Perceptions of Service Quality will influence System Usage and User Satisfaction, and will ultimately have consequences for the Perceived Net Benefits." : "Khayun & Ractham, 2011.

One of the contributions of this study relates to the examination of the net benefits. While previous studies have evaluated net benefits and performance as one construct with multiple indicators (Cheng, 2011; Hasim & Salman, 2010; Hou, 2012; McGill & Klobas, 2009; Norzaiddi, Chong, Murali, & Salwani, 2007), this study has made a step forward to deal with net benefits construct as four separate constructs; process, knowledge acquisition, communication quality, and decision quality. Each of the four variables has multiple indicators. This step is made in order to increase the power of explaining the output by the model. Consequently, the following hypotheses are proposed:

H1: Actual usage of e-learning has positive effect on net benefits among public universities students in Nepal.

3. Research Method

3.1 Overview of the Proposed Conceptual Framework

Based on the resource-based view and resource dependence theory, this study built the main relationship between empowering leadership and organizational innovation. In respect of empowering leadership, Kim & Beehr (2017), Zhang & Bartol (2010), and Zhang & Zhou (2014b) found that this kind of leadership style influences positively the innovation. Figure 1 depicts the conceptual model that was built on the review on the literature review.

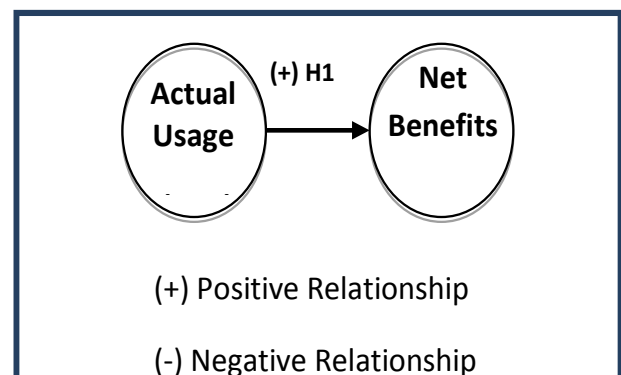


Figure 1: The proposed conceptual framework

3.2. Development of Instrument and Data collection

A questionnaire specially designed to measure all the main constructs of the research model was used to collect data for this study, it contained close-ended questions that were tested and translated into the Nepali language since the respondents would be from the Nepal. The study selected the sample from the population of privet universities in Nepal by using probability random sampling. This is when every element in the population have an equal chance of being selected as a subject [32]. Probability random sampling, in particular, gives the researchers the chance to choose equally from the sample frame.

4. Data Analysis and Results

4.2 Measurement Model Assessment

Construct reliability as well as validity (comprising discriminant and convergent validity) were used to examine the measurement model. The particular alpha coefficients of Cronbach were tested to determine the reliability of every core parameter in the measurement model (construct reliability). The quantities of all the unique alpha coefficients of Cronbach in this research ranged from 0.762 to 0.923, which went beyond the proposed value of 0.7 (Kannana & Tan, 2005; Nunnally & Bernstein, 1994). Moreover, for inspecting construct reliability, all the CR

(composite reality) values ranged from 0.863 to 0.938, which went beyond 0.7 (Werts, Linn, & Jöreskog, 1974; Kline, 2010"Principles and practice of structural equation modeling", "manualFormatting": "Gefen, Straub, & Boudreau, 2000. Thus, as Table 1 shows, construct reliability has been fulfilled as Cronbach's CR and alpha was rather error-free for all the parameters.

Analysis of indicator reliability was conducted by utilizing factor loadings. When the related indicators are very similar, this is reflected in the construct and signified by the construct's high loadings [37] by Hair, Hult, Ringle, and Sarstedt, provides a concise yet very practical guide to understanding and using PLS structural equation modeling (PLS-SEM. As per Hair et al. (2010), the exceeding of values beyond 0.70 suggests substantial factor loadings. Table 1 displays that all items in this research had factor loadings greater than the suggested value.

AVE (average variance extracted) was employed in this study to analyze *convergent validity*, which represents the degree to which a measure is correlated positively with the same construct's other measures. All the AVE values ranged from 0.678 and 0.685, which went beyond the proposed value of 0.50 [38]. Thus, all constructs have complied with the convergent validity acceptably, as shown in Table 1.

Table 1: *Measurement model assessmen*

Constructs	Item	Loading (> 0.7)	M	SD	α (> 0.7)	CR (> 0.7)	AVE (> 0.5)
Actual Usage (USE)	USE1	0.784	3.46	0.90	0.762	0.863	0.678
	USE2	0.867					
	USE3	0.818					
Net Benefits (NB)	NB1	0.849	3.98	0.871	0.923	0.938	0.685
	NB2	0.834					
	NB3	0.839					
	NB4	0.859					
	NB5	0.818					
	NB6	0.771					
	NB7	0.820					

Note: M=Mean; SD=Standard Deviation, α = Cronbach's alpha; CR = Composite Reliability, AVE = Average Variance Extracted.

Key: USE: actual usage, NB: net benefits.

4.3 Structural Model Assessment

The structural model can be tested by computing beta (β), R^2 , and the corresponding t-values via a bootstrapping procedure with a resample of 5,000 (Hair, Hult, Ringle, & Sarstedt, 2017) by Hair, Hult, Ringle, and Sarstedt, provides a concise yet very practical guide to understanding and using PLS structural equation modeling (PLS-SEM).

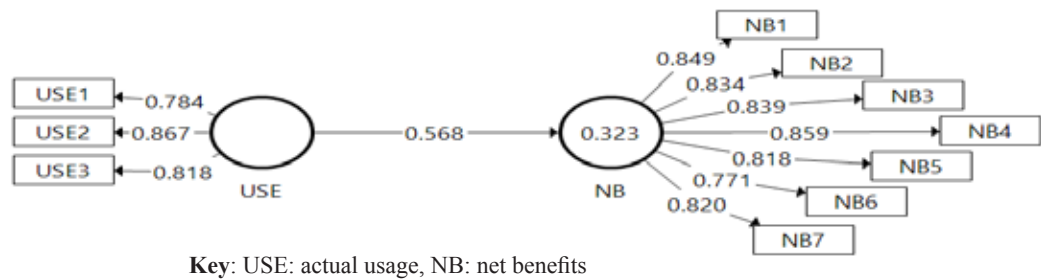


Figure 2: PLS algorithm results

Figure 2 and Table 3 depict the structural model assessment, showing the results of the hypothesis tests. Actual usage positively influences net benefits. Hence, H1 is accepted with ($\beta = 0.568$, $t = 12.587$, $p < 0.001$). Actual usage explains Thirty-two percent of the variance in net benefits. The values of R^2 have an acceptable level of explanatory power, indicating a substantial model (Cohen, 1988; Chin, 1998).

Table 3: Structural path analysis result

Hypothesis	Relationship	Std Beta	Std Error	t-value	p-value	Decision	R^2
H1	USE→NB	0.568	0.045	12.587	0.000	Supported	0.32

Key: USE: actual usage, NB: net benefits

5. Discussion

The main objective of the current study is to examine the impact of empowering leadership on the organizational innovation within the police sector in the UAE. As such, one hypothesis was generated to fulfill the main objective. Empirical results of testing the hypothesis show that there is a positive significant influence of the empowering leadership on the organizational innovation with ($\beta = 0.606$, $t = 13.799$, $p < 0.001$). Thus, the result shows that H1 is supported. This is explained by the fact that the leaders in the organization encourage employees to find solutions to their problems without his/her direct input, leaders in the organization advise employees to look for the opportunities in the problems they face, leaders in the organization urge employees to work as a team with the other employees who work at the organization. The newer technology is adapted in the organization for improving the work processes (Computers, wireless networking, etc.), we try new methods for improving processes (Paperless environment, online learning, etc.), and our organization is quick to respond to the changing needs of its customer.

6. Conclusion

The purpose of this article was to examine the impact of actual use on the benefit public universities students in Nepal. It has provided evidence from leading scholars in the field on the notion of actual use and how to improve this technique improve the required for the development of the building blocks of any organization (individuals) and consequently in organizations performance (innovation). In this regard, emphasis should be placed on the Fourth Industrial Revolution and its impact on education to include these skills in the curriculum, with a view to improving the learning environment and developing its systems, as well as introducing ideas that help to apply the culture of innovation, change and development

in schools, colleges and administrative and educational leadership. This article has shed some light on the net benefit of using e-leering in benefit public universities students in Nepal and the importance of the e-learning in that regard and proved that e-learning is plays a role helping the privet universities to improve their use of this technology .

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APPENDIX

Appendix A

Instrument for variables

<i>Variable</i>	<i>Code</i>	<i>Measure</i>	<i>Source</i>
Actual Usage	USE 1	I regularly use the E-learning	
	USE 2	I prefer the learning through the electronic devices	
	USE 3	I promote the E-learning to my colleagues	
Net Benefits	NB1	E-learning helps me to accomplish my tasks more quickly	
	NB2	E-learning make it easier to complete my tasks	
	NB3	E-learning helps me acquire new knowledge	
	NB4	E-learning helps me acquire new skills	
	NB5	E-learning helps me to come up with innovative ideas	
	NB6	E-learning helps me identify problems	
	NB7	E-learning helps me make higher quality decisions	

E-learning and Its Impact on Employability

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Abstract

E-learning in the institutions is very useful technological support for the learners' career and employability. E-learning plays an important role to fulfill the demand skill and competence for employability. According to Babiker (2015), educational institutions should use the multimedia applications in the classroom as an effective tool to promote learning. Educators and students are not getting good learning environment because current learning system is not appropriate. To face these challenges, there are new ways to deliver education to the students. It needs to developing and use of multimedia application for getting good results. This paper tries to present how the tourism institutions in Kathmandu are applying E-learning practices for learning and teaching and its impact on employability. The method used in the research was Descriptive research, on the basis of literature review, perspectives from the students and teachers, observation of 20 institutions and class rooms, and getting interactions with students, teachers and principals, and tent to describe the practices of e-learning and impact of them on employability. This study found that effective e-learning pedagogical approach in the tourism institutions linking to traditional curriculum with its new reform for the present and future dynamic professional and employability.

Keywords

E-learning, technonology, tourism, institutions, employability,

Introduction

E-learning plays the most important role to enhance individual employability in terms of communication, interpersonal, management and leadership skills for the better outcome of the organization. Particularly, in education sector of the developing countries use of ICT is mostly realized (Zaheer, Jabeen & Qadri, 2015). Chang V, 2015 as cited in Shakya, Sharma, and Thapa (2017) that e-learning is new technology that helps to bring new change in the institutions fulfilling the demand of new and present generation. Şahin, & Kislak (2016) added that computer-aided instruction, computer-based instruction and e-learning are the learning environments using web technology in education.

E-learning environment in the institutions is very useful technological support for the learners' career and employability. E-learning plays an important role to fulfill the demand skill and competence for employability. Babiker (2015) explained that educational institutions

must recognize that the use of multimedia applications as an effective tool to enhance learning in this modern world. Educators and students have needs that our current learning system is not appropriate. To face these challenges, there must be new ways to deliver education to our students. It needs to developing multimedia application for solving some of these problems. This is the age of information and communications technology (ICT), e-learning refers distance education and learning with and through the use of electronic technologies. (Nwana, Egbe & Ugwu, 2016).

Different universities in Nepal are initiating to use e-learning as an effective pedagogy in teaching and learning including distance education and online learning. (Shakya, Sharma, and Thapa, 2017). For better e-learning practices in higher educational institutions, improvement of lecturer proficiency in e-learning, good ICT infrastructure and conducive e-learning policies, the community of adopters play crucial role (Makhaya and Ogange, 2019).

Problem Statement

E-learning has not been adopted effectively in the institutions of Nepal to produce employable human resources. Integrated e-learning with traditional curriculum has become uncomfortable in teaching and learning practices. The institutions are still practicing traditional curriculum and instructional pedagogical approach in learning and teaching though it is the age of advanced technology and its huge influences in the societies. The impact of e-learning on tourism employability cannot be realized positively.

Objective of the Study

The main objective of this study is to find out the answer of the following two research questions.

1. What are E- learning practices in the tourism institutions?
2. What are the factors of E-learning to impact on tourism employability?

Research Method

In this study **Descriptive research** is used to describe e-learning practices applied in the tourism institutions in Kathmandu, Nepal. The method used in the research was **Descriptive research**, on the basis of literature review, perspectives from the students and teachers, observation of 20 institutions and class rooms, and getting interactions with students, teachers and principals, and tent to describe the practices of e-learning and impact of them on employability.

Limitation

This study is mainly focused to the secondary data from the literature review of e-learning, institutional application of e-learning, employability and factors of employability and analyzed in the context of e- learning and its practices only in the 20 institutions in Kathmandu through only the observation, interaction with students, teachers and principals.

Literature Review

E-learning materials and methods

ICT plays a vital role for applying e-learning programs. The main role of it is to support and manage the delivery and communication using computers and Internet. For the development of e-learning, ICT provides suitable environment through the various parameters and services.

At present, ICT helps for many individuals, offices, homes and business centers. Many new opportunities are created in various governmental and nongovernmental organizations to support ICT infrastructure, IT business, software development, and service sector. Similarly, IT education has also grown in almost all institutions of learning (Ahmed, Hussain and Farid, 2018). They are computer, internet and e-mail, videophone systems, teleconferencing devices, Direct Broadcast Satellite (DBS), Digital Satellite Systems (DSS) courseware, e-readers and e-books, e-graphics board, multimedia projector, digital library, digital laboratory, Bluetooth devices and educational robots.

The use of multimedia in the institutions has made effective learning environment. O' Halloran, 2008, as sited in Vorvilas (2014), multimedia learning material, semiotic resources have four kinds of meanings: experiential meaning (the ways of visually or verbally represented human experience in a multimedia), logical meaning (the link between information and multimedia components), interpersonal meaning (learners' engagement and interaction with multimedia representations), textual meaning (the ways multimedia components are spatially and temporarily co-deployed on the multimedia representations' layout). Multimedia is effective material to enhance learning competencies of the students in the institutions.

Mobile phones in the present time are useful and favorite device to support E-learning to the individuals. Parajuli (2016) explained that the majority of the students in Nepal had positive attitudes towards mobile phones and used them for learning both inside and outside of their classes. But they did not get effective use of mobile phones for learning practice because of the lack of institutional support. He suggests that comprehensive mobile learning is not widely used but conventional learning with the incremental use of mobile phone can be applied in higher educational institutes in Nepal and the combine effort of the teachers and institutions with appropriate methodology should give guidance to the students for successful use of technology effective learning. But use of mobile phone by the students in the classrooms and institutions was not taken positive.

Virtual learning environments(VLEs) promote the formal E-learning that has linked with the relationship between teachers, students and school. Such learning environments have been supported by the internet, among institutions,

students and teachers, implementing the educational guidelines and curriculum of the country. VLEs give institutions with great quantities of information and the possibility to manage it and provide it to their members in a simple way and with a guarantee of quality and validity and may enable the student, the teachers and the education institution to develop procedures to avoid academic failure or dropout (Alves, Miranda & Morais, 2017).

E-learning is a combined effort with traditional learning system such as traditional learning, existing national curriculum and pedagogical tools. Bundsgaard, & Hansen (2011), defined three types of learning materials in terms of tools, texts and, tool and text characterized with facilitation of learning and teaching: first type ‘functional learning materials’ include black and white boards, computer applications, projectors, and mobile phones, second type ‘Semantic learning materials’- film, literature, charts, pictures, paintings and other texts and objects, and third type “Didacticized” learning materials’- textbooks, online teaching materials, and educational games.

E-learning and Its Impact

E-learning is the most important for the educators to motivate the learner’s attitude towards learning and it also creates an awareness to develop an understanding for the need of employability skills that is required in job place. E-learning provides the educators opportunities to understand how they can engage, impart knowledge, develop relevant skills and make them ready for the employment (Singh, & Singh, 2017).

Further Sharma & Bhatta, (2018) state e-learning is the present and future requirement especially in developing countries like Nepal. It is efficient, time saving and cost effective in the long run. Using e-learning in the combination with traditional curriculum in the institutions is very beneficial. They also add that learning technologies and digital learning material play a crucial role to improve educational practices and effective learning for students, faculty, and institutions, and that is also more efficient than traditional learning practices.

Chen, et al., 2010, as sited in Wang, Iwata, & Jarrell (2018), compare e-learning with the traditional learning systems and tells that e-learning is the new learning practice with new experiences in which students involve actively and collaborative learning than students with only traditional class-learning. E-learning also creates motivation in the students to learn deeply in terms of higher-order thinking and reflective.

Hylton, Levy, & Dringus, 2016, as sited in Singh, & Singh (2017) at present e-learning has become very productive and useful for the availability of e-learning opportunities. The following advantages of e-learning are explained by Shakya, Sharma, & Thapa (2018) that has brought an awareness towards e-learning practices and positive impact on professionalism.

Table 1: Positive Impact of E-learning

- | |
|--|
| <ul style="list-style-type: none"> • E-learning saves costs of travel expenses; facilities and supplies costs; administrative costs; salaries and lost opportunity cost- • E-learning promotes learning, saves learners’ time in searching information and facilitates learners analyzing large collections of data. • E-learning technologies motivate students and trainees towards learning. • It activates learners • E-learning provides a more in-depth learning experience. • Learners can get the best instruction available. • Training occurs “just in time”. • Learners set the pace and schedule. • Learners can have better access to instructors. • Training with various learning styles. • E-learning produces positive effects. • Make teaching easy from different locations. • Course content can be dynamic. • For high-quality training, including training around the globe without travel. • For valuable learning resources |
|--|

Source: Shakya, Sharma, & Thapa (2018)

Table 2 Negative side of E-learning

- | |
|---|
| <ul style="list-style-type: none"> • E- Learning requires more efforts of instructor and learners • Instructors need more preparations, • Online courses consume more time and effort than traditional courses. • Conversion efforts take longer than expected • Converting existing classrooms to online courses has proven harder than many designers expected. • Technical problems occur as main barrier for E-learning. • Like distance learning E-learning may be impersonal to lack face to face contact. |
|---|

Source: Shakya, Sharma, & Thapa (2018).

Employability from E-learning

Ofoego and Ebebe (2016) explained the importance of teacher education system of Nigeria to get professionalism in teaching combined with national development. The

reforms in education in the nation had positive impact on teaching profession. Subject matters, development of new skills, training and values are factors that supported to make teacher education and teaching profession strong. It is advised to include ICT and computer programmes in teacher educating process with the reforms in national education to achieve quality teacher and quality education. For individuals, employability refers the knowledge, skills and abilities they possess, in addition to the way they present those assets to employers. As such, employability is affected by both supply-side and demand-side factors which are often outside of an individual's control. Employability skills are the non-technical skills, knowledge and understandings that are necessary to gain employment and participate effectively in the workplace. All the required solutions can only be acquired from wide range of e-learning practices in educational institution, work place and individual level as whole.

Discussion

E-learning in Education and Institutions

Like other developing countries e-learning practices in and outside institutions in Nepal are rapidly growing and trying to settle e-learning environment. Nagarajan and Jiji, 2010, as cited in Al-Ammary, Mohammed and Omran (2016) e-learning considers as a part of the educational system which brought an innovative change in the learning environment. Phillips, et al., 2012, as cited in Al-Ammary, Mohammed and Omran (2016) that the implementation of e-learning should be effective that enhance the educational opportunities and increase a positive attitude toward the learning process and supports students in developing skills they require for this century. Without e-learning the institutions are not able to improve the productivity and performance in the process of educating the students. For the effective learning, cost of e-learning infrastructure, wide range of e-learning practices and capabilities, proper use of resources are determinant factors. And e-learning is effective by conducting with the institutional strategies, goals and objectives. Huge investment in e-learning and IT projects with technical support can bring institution's productivity, strengths and improvement of the learning processes. It also has a positive effect on the pedagogical aspects of e-learning including the institutional planning and management. (Al-Ammary, Mohammed, & Omran, 2016).

Multimedia application development and use in the institutions is the essential part for e-learning. Babiker (2015), presented an action plan for the development of multimedia applications to be followed by the educational institutions staff, administrators, teachers, and parents and community members. Professional development, technology plan, sharing technical and artistic knowledge, making aware of the capabilities of multimedia tools within the learning environment, finding additional financial resources by educational institutions are the essential factors to improve teaching and learning.

Wise and wide range of e-learning development, practices and application through the formal and informal ways do have positive reflection on employability in the present context of Nepal.

ICT Infrastructure and E-learning

ICT infrastructure is essential to support e-learning in education. Various services of ICT industries help to implement and develop e-learning in education, business and service fields. In Nepal, according to *ISPAN* (2017), there are 21 internet service companies have been delivering internet services to the people.

Table 3: List of internet service providers in Nepal

1. Vianet Communication
2. [Loop Networks pvt.Ltd.](#)
3. [WorldLink](#) Communication Pvt Ltd
4. [Subisu](#) CableNet Pvt. Ltd.
5. [Mercantile](#) Communication
6. [Classic Tech](#) Pvt Ltd
7. [BroadBand](#) Solutions Pvt. Ltd.
8. Nepal Telecom ADSL Service
9. Broadlink Networks and Communication Pvt Ltd
10. Infocom Pvt Ltd
11. Ultranet Communications
12. Konnect Nepal
13. Himalayan Online Service PVt Ltd
14. [Websurfer](#) Nepal Pvt Ltd
15. EAST LINK TECHNOLOGY PVT. LTD.
16. Otel
17. Techminds Network Pvt. Ltd.
18. Everest Link (P) Ltd.
19. Unified Communication Pvt. Ltd
20. Allied NetLink Technologies Pvt. Ltd.
21. [Reliant](#) Techno Networking Pvt. Ltd.

Source: *ISPAN*. 2018

According to Nepal Telecommunications Authority (NTA), now there is rapid increase in number of phone and internet users in Nepal. More than 250 new users were connected to the internet every hour last year. NTA's Management Information System (MIS) said that 2.25 million new users were connected to the internet last year. October 2017, 16.67 million Nepalis had been connected to the internet, up 15.60 percent year-on-year. About 63% of Nepal's population is accessed to the internet (The Kathmandu Post). It shows e-learning environment is being rapidly made. Rapid growth of ICT infrastructure development in Nepal is a positive sign for e-learning.

E-learning resources and materials

E-learning infrastructure, resources and materials are basic for teachers, students and staffs in the institutions to support and engage them in e-learning. Dearing, 1997, as cited in Singh, & Singh (2017), that e-learning online materials are very helpful for conducting suitable learning and teaching. For good and comfortable learning environment and independent learning are possible in educating process by e-learning practices. In addition Deschacht, & Goeman, 2015, as cited in Singh, & Singh (2017) that this happens while there are the growing uses of internet, computers, electronic media in the classroom and individually at home or job place.

In Nepal as a developing country, access of ICT infrastructure and e-learning resources and materials is growing, Williams Pitchforth, & O'Callaghan, 2010, as cited in Bhatta, Shrestha, Shah, Karki, Chaudhary, Gupta, & Aryal (2018) that developing countries are also growing in the use of computer and internet-based learning developed countries compared to the past years. Large investment is required in Nepal for the development of e-learning resources and materials such as productive e-learning trainers and teachers, e-learning assets such as internet, computers, and multimedia devices and others.

E-learning and employability

Koohang & Paliszkievicz, 2013; Keh, Wang, Wai, Huang, Hui, & Wu, 2008, as cited in Singh and Singh (2017) that e-learning is worldwide for educating and training individuals providing proper various educational programs. Beaudoin, Kurtz, & Eden, 2009; Levy & Ramim, 2015 as cited in Singh and Singh (2017) stated that e-learning systems provide proper learning environment and work for educational institutions,

corporations, and general life-long learning. E-learning particularly concerned with individual skills, knowledge and competencies an ability to work at work place.

Without e-learning in educating process there is no employability at all.

Dearing, 1997, as cited in Singh and Singh (2017) employability is an individual ability to get appropriate employment in terms of educational standard. Quality education determines the personal employability in present competitive and challenging employment market. Hillage and Pollard, 1998, as cited in Singh and Singh (2017) person's knowledge, skill and attitude are the basic components for an individual employability that is the requirement for potential labor market. Again Yorke and Knight, 2004, as cited in Singh and Singh (2017) an individual success in the job is only determined with his or her employability including skills, understanding and personal attributes, and employability is the achievements that benefit to the persons him or herself, the work force, the society and the economy as a whole. In addition employability is the personal skills that associate with self-management, problem-solving and people skills supported by functional competencies like traditional literacy, numeracy and effective use of Information and Communication Technologies. Poor and lack employability skills create the unemployment problems and impact negatively on the employees, employers, economy, and society (Singh and Singh, 2017). So e-learning in the education and institutions is an appropriate learning environmental support for the present and future employability in the work place.

Findings

Bright signs for e-learning

Individual, institutional and organizational consciousness and attitude is very positive towards ICT and e-learning. After the study in different institutions it is found that teachers, students and staffs in the institutions have kept right concern to the e-learning and necessities of e-learning practices. Government and ICT industries are growing their effort to facilitate the services to the people that is a crucial support for the e-learning. According to the Nepal Telecommunications Authority (NTA) "Nepal added over 250 internet users per hour" and nearly 63 percent of Nepal's population is now connected to the internet ([The Kathmandu Post, 2018](#)), more than 21 internet service providers/companies are providing internet service

in Nepal (ISPAN, 2017). The use of personal computers and smart phones has been rapidly increased for recent years.

Educational institutions have started to develop ICT and e-learning infrastructure realizing the importance of e-learning. According to the principals of the institutions, the investment to the electronic resources: computers, internet, multimedia, television, e-library etc. and for teachers' professional development programs has been rapidly increased in the recent years than before.

Difficulties for e-learning

Educational institutions are still facing a challenge with the rising cost of e-learning infrastructure, lack of e-learning practices and capabilities, and level of student achievement and improvement. The many institutions are still facing the lack of e-learning assets or materials: computers, internet, and multimedia devices. Some of the institutions are trying to increase and manage those kinds of materials. But there is no proper use of those materials as effective tools for learning. Teachers are not properly trained to use devices for e-learning. Institutions are still suffering for finding good instructors, experts to provide e-learning training to the teachers. Almost institutions among 20 did not have any specific plan for providing appropriate e-learning skill development training to the teachers. Teachers are not getting out from traditional learning systems, curriculum, and learning and teaching method.

Factors to Impact Employability

Employability depends on e-learning educational environment, quality, standard and practices. Self-management, problem-solving skills and functional competencies like traditional literacy, numeracy, and effective use of ICT are also other factors to impact employability. And above mentioned 'bright signs of e-learning' are the factors that have positive impact on tourism employability, whereas the above mentioned 'difficulties for e-learning' are negative.

Conclusion

Present e-learning practice of Nepal in the tourism institutions, organizations, industries and individual level has showed positive sign to bring future employability in the educational and service fields. However it is not enough because of so many difficulties are found in the application and management of e-learning in the

institutions and workplaces. Outdated contents of existing traditional curriculum should be reformed and priority of e-learning practices in the course and contents have to be combined.

Further development of ICT infrastructures, e-learning materials and methods, teachers' professional development training, and specific awareness programs to the students to adopt e-learning would help to avoid present negative sides of e-learning to establish positive impact to the future development.

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Why IT purchasing managers behave defensively? : A Conceptual Model

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Abstract

Today, corporate competition is severe and the external environment is changing rapidly and widely. In addition, the rapid development of information technology(IT) represented by the fourth industrial revolution is accelerating these changes. And companies are recognizing the introduction of information technology as a necessity, not a choice.

Generally, a company is an organization composed of various members to create economic value and share it. Therefore, in order for a company to cope with rapidly changing Information Technology in a timely manner, positive behavior on change of members is most important. That is why many companies are interested in the topic of change. From this point of view, it is becoming more important for companies to manage changes to their members.

However, many companies are not successful in these change management efforts. Most change management efforts are initiated by the will of top management and the needs of its members, but ultimately fail to change the 'Attitude and Behavior' of its members. This is because members ignore the fact that they determine attitudes and behaviors according to the level of individual benefits and costs, rather than rationalizing them to achieve organizational performance according to economic principles. And the behavior of these members is mainly in the form of Defensive Behavior. Therefore, it is important to minimize the defensive behavior of the members in order to lead the change of the organization successfully. In this respect, it is necessary to identify factors that cause defensive behavior of members in the organization and to analyze how these factors affect individual behavior.

In this study, we identify the factors influencing the attitudes of the organizational members and propose a model to measure the defensive behavior level of the members. To this end, the integration of Readiness Model to explain organizational change, the Theory of Reasoned Act (TRA) that explains the rationality of individual behavior, and Rational Choice Theory (RCT) We present a model.

Keywords

Change Management, Rational Behavior, Individual Behavior, Attitude, Readiness Model, Theory of Reasoned Action, Rational Choice Theory.

Research on Factors of Regional Identification

The Tanabe-Nishimuro Area of Wakayama Prefecture as an Example –

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Abstract

Now a day Japan has problems such as population decline. The residences are love own area is very important. And have question is What is factor for divide reginal area and neighborhood area. Some factor higher mountains, Big River or Ocean. This research purpose found to factor area divide not only geographic factor. In this research, I would like to discuss the factor of the difference for the purpose of narrowing the concept of the area, taking Wakayama prefecture southern area as an example.

1. Introduction

Presently, Japan is grappling with problems of depopulation, urbanization, a decreasing birthrate and an aging population. There is a growing popularity for compact cities such as Fukuoka, but this is an exception, as regional cities and their suburban and rural areas are losing their "regional potential." "Regional revitalization" is a measure to overcome this problem, but in the process is revealing problems with government, local authorities and even private enterprises, and more efficient policies are being called for. In considering regional revitalization in this paper, an important factor was deciding the regional range. In particular, I felt it important to decide the range of what people thought of as "our town." When growing connected to a town, it is thought that a common consciousness arises. I will consider what factors into this creation of a common consciousness using the Tanabe-Nishimuro area of Wakayama prefecture as an example.

What is often called "the Great Heisei Mergers" led to a significant decrease in local governments. Because of this, the range of each group of municipalities increased. The number of municipalities in Japan has decreased nearly by half; from 3,235 in January 1st of 2000 (prior to the aforementioned "Great Heisei Mergers"), to 1,724 in May 23rd of 2019.¹ In terms of area, the city of Takayama in Gifu Prefecture is the largest in the nation

at 2,177.61km², with Kagawa Prefecture the smallest at 1,876.78km² and Osaka Prefecture the next smallest at 1,905.29km².² The areas addressed in this paper are the city of Tanabe in Wakayama Prefecture, at 1,026.91km², and Nishimuro District, also of Wakayama Prefecture, at 432.80km², for a combined area of 1,459.71km². This is 76.61% of neighboring Osaka Prefecture. Osaka Prefecture continues to have differences in culture and dialect between the Settsu (including the present Hyogo Prefecture area), Izumi and Kawachi areas. The Tanabe-Nishimuro area of Wakayama Prefecture examined in this paper are a considerably large area. This author believes that "local consciousness" among both native residents and recent transplants is an important element in leading to the success of "regional revitalization." Even when administrations are merged, it is believed that the development of a local consciousness is not an overnight occurrence.

Now, the foundation for regional revitalization cannot be built without a local consciousness. The method of research used in this paper is primarily a qualitative analysis of interviews with subjects living in the aforementioned areas. This is not an exhaustive survey, and includes a limited number of subjects. However,

¹ E-Stat, Portal Site of Official Statistics of Japan (Ministry of Internal Affairs and Communications), as of May 23rd, 2019.

² Geographical Survey Institute, the area of prefectures and municipalities nationwide, as of October 1st, 2018.
<http://www.gsi.go.jp/KOKUJYOHO/MENCHO201710-index.html>, retrieved May 23rd, 2019.

the interview is carried out with things like age and educational background taken into consideration. Also, other factors such as mass media and transportation will also be examined based on surveys by the Ministry of Internal Affairs and Communication and briefs from local governments. The purpose of this paper, using the above methods, is to elucidate the factors by which people identify their area.

2. Prior Research

2.1 The Area from the Perspective of Katsue Misawa

As a pioneer in the study of the geography of regional individuality, Katsue Misawa³ stated in his thesis that it is "the complete body at the interface between the earth and the atmosphere." Here we will look back on Misawa's thoughts and develop a summary.⁴ Misawa developed unique thoughts and views regarding "regional culture." Misawa's "regional culture" is the space generated by the contact between the surface of the earth and the lower reaches of the atmosphere. As a place it is distinctive and diverse, and is the basis for regionality, in other words, "regional individuality" and "regional potential." Misawa spent his life as an educator, but it is known that he guided and proposed "Regional Culture Industry"; industry which has deeply incorporated the regional culture. Misawa's research, 80 years after his death and amid current calls for regional revitalization, continues to grow in brilliance. Often considered the founder and developer of the field of geography in Japan, Misawa is also thought to be a pioneer in the theory of regional revitalization. Over the last 100 years Misawa's treatises continue to shine. The "Exploration of Regional Individuality and Regional Potential" advocated by Misawa is a very effective viewpoint for present-day regional revitalization. According to Misawa, the theory of city superiority is mistaken, and there is an obligation of "a city for the city, a village for the village." It is the individuality and potential that decide the mission of a region, and we must coexist and co-prosper by being aware of and demonstrating regional individuality. We must also achieve regional promotion with the potential of the region, the only one of its kind in the world. The role of geography is to reveal the "regional potential," and the source of "regional potential" is the "power of

nature." Also, science is to respect and align with nature, and "regional potential" must come before diligent effort.

The lack of awareness for the regional qualities of the hometown which restore regional individuality and a pride in that individuality, harmony with regional individuality which creates gravity and an observing eye to an investigation of a (public) living space, with an actual search for regional individuality in Nagano Prefecture is given as a concrete example. Misawa is referring to the geographical factors of the region.

2.2 The geographical context of the Tanabe-Nishimuro Area

Unlike Nagano Prefecture where Misawa resided, there is no large mountain range in the suburbs of Wakayama Prefecture's Tanabe City. There are also no divisions between islands. It is thought that in a given region, regardless of the administrative scope of the people, there is a specific range of what constitutes the "local area" for both current residents and natives of the area. There is also the concept of Kinan in the Tanabe-Nishimuro area. According to Yoichi Koike (1986), "the eastern area of Nishimuro...is considered to be Kinan. ...in Kinan, the Kumano denomination still remains. Kumano is the name of the country before the Taika era, and it is said that it was integrated into Kii province by the Kokugunri System, and it has been part of Muro District ever since then, but Kumano is a more widely used informal name."

In Wakayama Prefecture, there are currently 9 cities, 6 districts, 20 towns and 1 village. Regarding the Tanabe-Nishimuro area treated in this paper, the area of Tanabe City has widened due to the Great Heisei Mergers,⁵ as previously mentioned. According to residents, it was felt that this merger extended beyond the area of their town. On May 1st, 2005, Tanabe City merged with Ryujin Village of Hidaka District, the town of Nakahechi in Nishimuro District, Oto Village and the town of Hongu in Higashimuro District. Ryujin Village of Hidaka District and Hongu of Higashimuro District outside of Nishimuro District were originally part of the Tanabe City area. In the author's field research, although the dialect of Ryujin Village in Hidaka District is little different from that of Tanabe City, Hongu of Higashimuro District is

3 Katsue Misawa, 1855-1937, Geographer

4 The Rural Culture Association Japan, "Katsue Misawa Collection, Discovery and Creation of Regional Culture, Vol. 1, An Exploration of Regional Individuality and Regional Potential," 2009.

5 April 10th, 2019, The Great Heisei Mergers, Asahi Shimbun. The mergers started to peak around 2005, with generous incentives such as special-case bonds being awarded to lighten the burden on local governments. The number of municipalities across the country went from 3229 in 1999, to 1727 in 2010.

originally within the cultural area of Shingu City through the Kumano River (Shingu River) Basin. The dialect is clearly the dialect of Shingu City, and there is a difference in accent. The Wakayama dialect is considered part of the Kansai dialect. But within Wakayama, there is a dialect centered around Wakayama City, including the Kinokawa basin, Gobo City and the Hidaka area, and a dialect centered around Shingu City, including the Shingu area. The dialects for Shingu are the same dialect group as Kumano City and Owase City, both across the prefectural border in the Higashikishu area of Mie Prefecture. Higashikishu was once part of the Kishu Domain, which became part of Mie Prefecture with the abolition of the Han system. There are several factors that distinguish the area within Wakayama Prefecture. The distinction is described below. When broadcasting on terrestrial television, the Japan Meteorological Agency announces the weather dividing Wakayama Prefecture into Northern Wakayama and Southern Wakayama. The Agency divides the region into these 2 according to the area classification method. Meteorological warnings are announced dividing the region into 4: Kihoku, Kichu, Tanabe-Nishimuro and Shingu-Higashimuro. However, this division is centered on the basic local governments, and therefore Tanabe City after the Great Heisei Mergers is considered one region. However, the division of old Ryujin Village in Hidaka District and Hongu in Higashimuro District have changed to reflect the mergers, even though the conditions which affect the weather have not.

A Consideration of Specific Factors in the Tanabe-Nishimuro Area

The Tanabe-Nishimuro area, to put it simply, is a warm climate located in the southwestern part of the Kii Peninsula of the Kinki region. It is a relatively short distance from Osaka City, and central Tanabe City can be reached by express train in about 2 hours. Also, the town of Shirahama in Nishimuro District has the Nanki-Shirahama Airport, and can be reached from Tokyo in about 1 hour on one of 3 daily flights. There are few plains, and citrus and plum cultivation is carried out at the foot of the mountains. As mountain forests are numerous, the lumber industry was once prosperous, but with an increase in imported lumber and changes in building materials, this industry has been in decline. Currently, tourism centered around the Shirahama hot springs has taken center stage. In this chapter, as mentioned previously, we will consider specific factors in the Tanabe-Nishimuro area.

3.1 Mass Media

The situation with the mass media is that, when looked at nationally, Wakayama Prefecture newspapers have features which differ from other regions in Japan. First, none of Kyoto Prefecture's "Kyoto Shimbun," Hyogo Prefecture's "Hyogo Shimbun," Toyama Prefecture's "The Kitanippon Shimbun," or Kagoshima Prefecture's "Minaminippon Shimbun" are prefectural newspapers.⁶ However, "Kii Minpo," which has a narrower market than the "prefecture paper," has been issued and delivered primarily to Tanabe city in Wakayama Prefecture, and it is the only one in Wakayama Prefecture which has joined The Japan Newspaper Publishers & Editors Association. It was founded in 1911 and has sold 33,142 units.⁷ The delivery area⁸ is the entire area from Hidaka District to Tanabe City, Shirahama, the town of Susami and the town of Kushimoto, and is also sent nationwide to residents of each area using third-class mail. It is 12 pages in length, and a special feature page has been created for the Minabe and Kushimoto areas. The delivery area has a population of 123,999 people, and 69,136 households⁹, and looking at the figures, readership is approximately half of all households. One cannot help but think that these publication numbers have an impact on the region. Since they are affiliated with Kyodo News and the Asahi Shimbun, the entirety of the second page is filled with national articles, while the remainder, with the exception of television listings, contains articles on Tanabe-Nishimuro, Minabe and Kushimoto. This is considered very unique to the region. This point requires further investigation, but can here be considered a defining feature.

Northern Wakayama Prefecture, being close to Osaka, received television signals from the Mt. Ikoma transmitting station (Osaka Central Office), and people previously watched broadcasts as part of the Osaka area (except for Television Osaka). When Osaka Television Broadcasting (currently a merger of Asahi Television Broadcasting Corporation and Mainichi Broadcasting System) and NHK Osaka started broadcasting in 1956, it was possible to watch these broadcasts in northern Wakayama

6 Newspaper Affiliate of the Japanese Newspaper Publishers & Editors Association

7 April, 2018. ABC Copies Sold, as of April, 2018. Retrieved from Kii Minpo Homepage.

□<http://www2.agara.co.jp/cnts/info/> Retrieved May 23rd, 2019.

8 Telephone interview with Kii Minpo sales department, May 23rd, 2019.

9 From data from the Japan Geographic Data Center, author's tabulations <http://www.kokudo.or.jp/service/data/map/wakayama.pdf>

Prefecture.¹⁰ In southern Wakayama Prefecture, due to the distance and the Izumi mountain range blocking signals, it was not possible to watch these broadcasts. In former Tanabe City, some locations were able to watch cable television, but most households watched JRT Shikoku Broadcasting or NHK Tokushima, both located in Tokushima Prefecture on the opposite shore from the Kii Peninsula. In 1968, a relay station was installed at Heisogen in Shirahama, and the old Tanabe City and Shirahama, as well as the town of Minabe, become part of the official Osaka television broadcasting area. At the same time, similar relay stations were installed in Gobo City, Kushimoto, and Shingu City. This became the official area for Osaka television broadcasting, as a part of the greater Kinki area. This greater area was granted a broadcasting license by the former Ministry of Posts and Telecommunications. The Greater Kanto area (Tokyo, Kanagawa, Chiba, Saitama, Tochigi, Ibaraki, Gunma) and Greater Tokai area (Aichi, Mie, Gifu), Quasi-Greater Okayama-Kagawa area, Quasi-Greater Shimane-Tottori area and other basic prefectural areas, except for areas such as Saga Prefecture and Yamaguchi Prefecture where signal overspill was occurring, were also granted licenses by the ministry. The 4 private Osaka broadcasting stations (except for Television Osaka: Mainichi Broadcasting System, Asahi Television Broadcasting, Kansai Telecasting Corporation and Yomiuri Telecasting Corporation) have the same broadcasting in Wakayama Prefecture. Commercials and news are the same, and are transmitted as are, without editing, via the aforementioned Mt. Ikoma transmitting station installed at the border of Osaka and Nara Prefectures. NHK Wakayama and Wakayama Telecasting have their own broadcasting, but NHK has few programs local to Wakayama, and Wakayama Telecasting has low viewership due to being heavy with mail-order shopping programs, which is believed to be the reason that television broadcasting from Osaka has a strong influence on Wakayama Prefecture. After the popularization of the internet, the influence of television broadcasting has been decreasing, but it seems to still have an affect on the life of many local residents. The Kinki area services 6 prefectures via the aforementioned Mainichi Broadcasting System, Asahi Television Broadcasting, Kansai Telecasting Corporation and Yomiuri Telecasting Corporation, as well as broadcasting which services each area. In Osaka Prefecture is Television Osaka, in Hyogo Prefecture is Sun Television, in Kyoto Prefecture is Kyoto Broadcasting System, in Nara is Nara Television, and in Wakayama is Wakayama

Telecasting. NHK has two local broadcasting systems for each area when broadcasting from Osaka to each of the 6 prefectures in the Kinki area. In Wakayama Prefecture, the television commercials and such are broadcast as are from the Osaka area, so it is thought that Wakayama is heavily influenced by Osaka culture and commerce. Also, in addition to the aforementioned Kii Minpo, Yomiuri Shimbun, Asahi Shimbun, Sankei Shimbun, Mainichi Shimbun and Nikkei are edited and published in Osaka, and the morning and evening editions are combined into one and delivered around Wakayama Prefecture. Unique to southern Wakayama Prefecture, an evening edition is not published. In Shingu City and Higashimuro District, the Chunichi Shimbun is delivered from Nagoya. In addition, there are no private prefectural FM broadcasting companies, as there are in almost all the other prefectures. Wakayama Broadcasting is broadcast on AM within the prefecture. Wakayama Broadcasting has three separate business broadcasts for the Wakayama-Hashimoto area, Gobo-Tanabe area and the Shingu-Kushimoto area. It is in this way that in southern Wakayama Prefecture, mass media is said to differ from the rest of the nation. Because of these conditions, it is thought that the residents of the Tanabe-Nishimuro area, the subject of this research, are not conscious of the prefectural capital of Wakayama City, which gets its information from Osaka. Also, the dialects have changed due to the influence of television.

3.2 School Districts

Wakayama Prefecture was divided into 9 high school districts until 2003. In the example of the scope of this study, the old Minabe of Hidaka District and the old Tanabe City were different school districts, and even though the middle school students of Minabe were located nearby, they couldn't matriculate in the Tanabe-Nishimuro school district. Therefore, a barrier exists between Tanabe City and Minabe. Also, teacher transfers among middle- and high-schools occurred within Tanabe-Nishimuro. Prior to the Heisei mergers, there were transfers to Kushimoto in Nisimuro, but after the mergers, Kushimoto became a part of Higashimuro, and so such transfers were no longer are possible. In addition, since the repeal of the aforementioned school districts, students living in Minabe could not go to Wakayama Prefectural Hidaka High School in the distant city of Gobo. Students have instead started coming to the closer Wakayama Prefectural Tanabe High School, which is the first preperatory school since the school district system. Tanabe High School was Wakayama Prefectural Junior High School (Wakayama Nichu) in the former system, and currently has a course which integrates both

¹⁰ Presently, a relay station has been installed for the Wakayama City area.

junior- and high-school, and is the top preparatory school in southern Wakayama Prefecture. It is the same school that post-war socialist and former prime minister Testuya Katayama calls alma mater. It would seem that the reason for the division between Minabe and Tanabe-Nishimuro would lie here.

3.3 Dialect

According to the website for Wakayama Prefecture,¹¹ Wakayama is largely divided into the Kihoku dialect around Wakayama City, the Kichu dialect centered around Gobo, and the general southern Kinan dialect. In this cultural project of Wakayama Prefecture, it is distinctly divided further; "within the prefecture, we will introduce the different dialects with the names of 50 former cities, towns and villages." On the same page, however, the dialects of old Tanabe City and Nishimuro District are grouped into the Kinan dialect, centered around Shingu City. Even the Wakayama Prefectural Government has Tanabe-Nishimuro and the Shingu area as the same dialect. This is the point of view from Wakayama City. It is clear that the Shingu dialect has distinctly different accents. This is also pointed out on the aforementioned website, but it has a common dialect for the whole of Wakayama, and a multi-layered dialect for each district. Except for the above mentioned Shingu dialect, the Kansai accent is the basic accent. However, in northern Wakayama Prefecture, "za" is pronounced "da"; there is no "za" sound. Also, in the former Tanabe City and Nishimuro area, "za" and "da" are replaced with "zo" and "do." For example, "doubutsuen no zou" (the zoo statue) becomes "zoubutsuen no dou." Also, throughout the prefecture, "cat" and "oyster" have their final vowel extended; "nekou" (rather than neko) and "kakii" (rather than kaki). In the former Tanabe City and Nishimuro District, "yanikoi" is used to express "sugoi" or "hijouni" (an expression that adds emphasis to a statement), whereas this word is not used in Wakayama City or Gobo City. It is used in the Shingu dialect. And again, the dialects of Wakayama Prefecture are further divided. In the southern part of the Kii Peninsula, there are some districts that were isolated geographically from neighboring towns by a ria coast. When the current Mitsui O.S.K. Lines were Osaka Shosen, there was a history of a cruise ship operating until 1938 around the Kii Peninsula. The traffic on the Kii Peninsula was inconvenient, and it was late 1959 when the JR Kisei Main Line railway

was completed through the entirety of the peninsula. The expressway up to Shirahama was completed in 2015, and still does not run the length of the peninsula. In addition, before the aforementioned television broadcasting from Osaka could be received, there was no use of "jibun" instead of "anata" (you) as in the Osaka dialect. But after broadcasts from Osaka were being watched, this custom from Osaka took hold.

4. An Investigation for Factor Identification of the Tanabe-Nishimuro Area

The previous chapter described the author's idea for specifying the Tanabe-Nishimuro area. But here, to provide support for my aforementioned stance, I will look at current residents of the Tanabe-Nishimuro area, natives of the area who now reside in some other area, as well as natives of the area who reside in the area. Here are the results of the interviews.

4.1 Details on Interviews About Regional Factors

Here, what separates the Tanabe-Nishimuro area from Shingu-Higashimuro and Gobo-Hidaka will be examined. We would like to figure out what the regional determinants are. First, we tried to interview a man living in Shirahama. When I interviewed the male resident¹² in his 60s living in Shirahama of Nishimuro, it was clear that the "New Tanabe City" established in 2005 is not part of the same cultural area. This male resident, having lived in Shirahama for a long time, graduated from Wakayama Prefectural Kumano High School in the town of Kamitonda, worked in Tanabe City and Shirahama, and afterwards started a poultry business. According to this resident, before the 2005 mergers, Tanabe City (hereafter, old Tanabe City) and Shirahama of Nishimuro District, the town of Hikigawa in Nishimuro District (incorporated into Shirahama in 2006) and Susami in Nishimuro District where within the range of "our town." The northern limit was old Tanabe City Haya District, and the southern limit was Susami. There are no large mountain ranges or other geographical features separating old Tanabe City and Shirahama of Nishimuro District, Kamitonda of Nishimuro District, old Hikigawa of Nishimuro District, the former Oto Village of Nishimuro District and old Nakahechi of Nishimuro District. And even though there are no geographical boundaries separating old Tanabe City and Minabe of Hidaka District, there is a barrier. Though the northern limit has no geographical element, residents feel there is a psychological separation. As

¹¹ Wakayama Prefecture Cultural Archive <https://wave.pref.wakayama.lg.jp/bunka-archive/hougen/chiiki/index.html>

¹² Yoshitaka Sakamoto, born July 14th, 1957 Born in Shirahama, Nishimuro District, Wakayama Prefecture. After graduating from Kumano High School in Wakayama Prefecture, worked in Shirahama and Tanabe City. Interviewed on April 29th, 2019.

mentioned previously, to the south of the boundary is Susami, but to the north is Higashimuro District. It is Kushimoto that bears paying attention to. When Oshima Village of Higashimuro District was incorporated in 1958, it was part of Nishimuro District, but in 2005 it was merged with the town of Koza in Higashimuro District and became part of Higashimuro District. Further south of Susami is farther away from Tanabe City-Shirahama. This subject testified that his high school friend was not north of Tanabe City.

In interviews with male residents of former Tanabe City,¹³ I found they had the same opinion regarding the regional area as male residents of the aforementioned Shirahama, that is: old Tanabe City, Shirahama of Nishimuro District, Susami of Nishimuro District, old Nakahechi of Nishimuro District and old Oto Village of Nishimuro District are all part of the Tanabe-Nishimuro area, whereas Minabe of Hidaka District, Ryujin Village of Tanabe City and Hongu of Tanabe City are all outside the area. And with the same interviewees, in relation to faculty members, I received statements to indicate that former high school school districts had an influence. They also evidenced that, after the repeal of the school districts in 2003, the area of Tanabe-Nishimuro possibly expanded to include Minabe of Hidaka District. In addition, due to the increase of students in Minabe of Hidaka District continuing their education at Tanabe High School, former Tanabe City students with low school performance aiming at continuing at Tanabe High School, instead continued on to Kumano High School. That old Tanabe City students didn't go to Minabe High School, but elected to go to the area's Kumano High School provides evidence that Minabe of Hidaka District was thought of as outside the area. Minabe High School is historically an agricultural school, which produced the hallmark agricultural product of Minabe and Tanabe City, the "Nanko Plum."¹⁴ Kumano High School originated as a school of forestry, as historically the region's main industry was forestry. There are no private schools in the Tanabe-Nishimuro area. Even those who go on to Chiben Gakuen Wakayama in Wakayama City, which is the top preparatory school in Wakayama Prefecture at present, there are very few students from the Tanabe-Nishimuro

area, but this would seem to be an exception, as the school is 100km away. Of the men who served as faculty members in the Tanabe City of the Great Heisei Mergers, via work experience at Chikatsuyu Middle School of the bordering old Nakahechi of Nishimuro District, there is Kobiro Toge in a large mountain range between old Hongu of Higashimuro District and old Nakahechi of Nishimuro District, which has different customs and a different dialect, which lends a geographical factor to the situation. From the interviewees, I received statements that they felt the rivers also had an effect. In Minabe of Hidaka District is the Minabe River, old Tanabe City has the Aizu River, old Nakahechi and Shirahama have the Tonda River, old Hikigawa has the Hiki River, and each river basin has a different culture, although improvements in roads have started to change this. In 2015 the Nanki-Tanabe Interchange was opened through to the Susamiminami Interchange, a direct governmental controlled freeway between the areas. In addition, the Susami-Kushimoto road is under development. There was also an indication that this may have led to a change in the way people thought about the region. At present, there is also the idea among Tanabe natives who live in Tokyo that their hometown is much smaller.¹⁵ In Tanabe City, there is Tokei Shrine, a World Cultural Heritage Site, which hosts a "Tanabe Festival" every year on July 24th.

□ It is a festival meant to resemble the Gion Festival of Kyoto, and even now, it is being carried out on a grand scale, and is thought to promote the culture of the city through the Kumano Kodo. Visitors to the Tokei Shrine are thought to originate from Tanabe. It can also be said that the "our town" of old Tanabe City and the "our town" of Shirahama is different. Tanabe City is the second largest city in Wakayama Prefecture and the largest city in the southern part of Wakayama Prefecture. Shirahama is famous as a sightseeing spot, but many residents move to former Tanabe City. The two interviewees from Shirahama went to different schools, Tanabe High School and Kumano High School, and had different occupations, but both had the same home town area. In addition, I thought it necessary to interview a resident of old Tanabe City, and so I interviewed a man born in 1931 in the town of Kozagawa and currently living in Tanabe City. Three generations ago his family moved from the present Kamitonda of Nishimuro District to Kozagawa, and by his generation his village had been submerged after the creation of a dam, so he moved to Tanabe City. His younger brother works a lumbermill in Wakayama City. He worked in forestry management in Shingu City, old Koza,

13 Hirofumi Hirohata was born on August 1st, 1957 in Shirahama, Nishimuro District, Wakayama Prefecture.

He graduated from Wakayama Prefectural Tanabe High School, and from the Department of Business Administration at Ritsumeikan University, worked in Osaka City for 1 year, and was later a junior high school teacher in the Tanabe-Nishimuro area for 35 years. He is now retired. Telephone interview on April 29th, 2019.

14 Born Katsutaro Takenaka in 1910, in Minabegawa Village (now Minabe Town), he was a teacher at Wakayama Prefectural Minabe High School. <https://minabe.net/gaku/rekishi/nanko/takenaka.html> Gekko Gardens Home Page, retrieved on May 2nd, 2019.

15 Kohei Yoneda, Mikasa Shobo, Director and Editor-In-Chief.

Kushimoto, Susami and broader Wakayama Prefecture. He felt the entire region of Wakayama to be local. But as an individual, he understood there were big differences. He continued to explain that during his mother's era (she was born in 1896), to get from Kozagawa to Koza, it was necessary to bring 3 pairs of sandals and 2 bento boxes, travel 5 hours one-way to central Tanabe, and from there ride a ferry. The 1960s saw the start of motorization, and the sense of distance changed. Presently, anywhere in Wakayama is considered to be within reach of a day trip. It is even possible to make day trips to Osaka or even Tokyo from Tanabe City. And he felt that geographical obstacles will continue to be removed, creating further change.

4.2 A Consideration of Regional Specific Factors

Through the interviews, it seems the configuration of Tanabe-Nishimuro has complex factors.

And, the sense of this region seems to be multi-layer structure. First, the network of elementary school districts, middle school districts, high school districts and inhabitants is changing. In an area without a university, the existence of old school ties cannot be denied. Also, since the "Great Heisei Mergers," the boundaries of basic municipalities seems to diverge from the understanding of areas among local residents. So, three characteristics of the Tanabe-Nishimuro area have been described. The "mass media effect," where Wakayama Prefecture has no prefectural newspaper, but relies on the "Kii Minpo" centered in Tanabe City and on television received unedited from Osaka. The "school district effect," which saw the creation of schooling areas. And "dialect," where dialects were founded due to geographical factors and long-underdeveloped routes of transportation. I have learned that it is these factors that are at play in the Tanabe-Nishimuro area.

5. Conclusion

Though further research is needed, the local consciousness of residents has become a multi-layered structure. The first layer is the elementary or middle school district and the immediate surroundings, the second layer is the area in and around a densely populated area, and the third layer is the hometown prefecture. It can be said that the influence of Wakayama City on the Tanabe-Nishimuro area is small. And the sense of an overall "Wakayama Prefecture" is relatively weak. Therefore, the sense of belonging to Wakayama Prefecture, as in the third layer, is lacking. The sense of belonging in the second layer is

thought to be the basis of "regional revitalization." The factors in local consciousness are that, based on interviews and the state of mass media, the local consciousness of the area is constituted by: the aforementioned geographical elements described by Misawa, the previous high school school districts, the influence of the high readership of "Kii Minpo" reaching half of all households, and the direct transmission of private broadcasting from Osaka. Since the high school school district was repealed as mentioned above, it is also possible to predict that further changes will be observed as time goes on. It is expected that the relationship between Minabe of Hidaka District and Tanabe City will change. However, even though the expressway has been improved, there are no plans to merge the greater Tanabe City area with the rest of the Kii Peninsula. What remains and what changes in the future remains to be seen. Of course, there are some people who have worked in Wakayama Prefecture as a whole, but it is clear that they have a sense of "Tanabe-Nishimuro." The factors that have a strong influence on separating Tanabe-Nishimuro from neighboring areas are, in addition to Misawa's geographical factors, "mass media," "school districts" and "dialect."

This case study was carried out on the Tanabe-Nishimuro area of Wakayama Prefecture. The number of interviews was insufficient, and so further interviews will be needed to strengthen the research. Also, there was no comparative research performed with other regions in Japan or in foreign countries. In addition, forms of mass media like television and newspapers have waned in influence with the introduction of the internet and social networking. But, it has been understood that the configuration of the area has been consistently influenced by, outside of geographical factors, "high school school districts," "mass media," and "dialect." Even with the mergers of basic municipalities into wider areas, little change is seen in local communities and culture. The author himself would like to research this issue further. And I also hope that this research will help local studies.

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Does Language Barrier Hinder South Korea from Getting More Foreign Tourists?

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Abstract

Language barrier may hinder the inspiration and entertainment of a tourist when visiting a particular destination because of misunderstandings or becoming lost. South Korea in general spoke the least English among Asian countries and it was a rare country in the world in which English was not used in signposts. Therefore, the objective of this study was to analyze the perception of foreign tourists towards their experiences regarding language barrier in South Korea. This study collected comments regarding language barrier in South Korea from well-known travel guides and travel information as well as travel logs of travelers to analyze the perception of foreign tourists towards their experiences. By using content analysis, results revealed that foreign tourists perceived language barrier more as challenges rather than hindrances. Language barrier did not prevent them to visit South Korea as a non-English speaking country.

Keywords

Language Barrier, Foreign Tourists, South Korea, Content Analysis

Introduction

The popularity of Korean popular culture, often known as the "Korean Wave," has attracted tourist arrivals. The number of international tourists has increased drastically since 2000 [7] and the majority of tourists come from ASEAN countries (Vietnam, Thailand, Philippines, Singapore, Indonesia, and Malaysia). Since 2000s, tourism has greatly contributed to the growth of South Korea's economy.

The Korea Culture and Tourism Institute claimed that the general satisfaction level of international tourists traveling to South Korea has been improving [12]. The image of Korea has improved, specifically in public order and safety [12]. As a result, in 2012, South Korea has been the 20th most visited country in the world and the 6th most visited in Asia.

Despite its popularity, international tourists to South Korea said the language barrier was the greatest inconvenience they experience [12]. This condition was supported by Korea Travel Easy which stated that South Korea was not exactly 'free and easy' friendly for foreigners due to

language barrier [15].

To understand the real situation, a survey in 2014 by the Visit Korea Committee showed that 66 percent of 3,024 foreigners complained about the language barrier [12]. Whereas, another survey in 2015 by the Korea Culture and Tourism Institute claimed that "Communication in English should be possible at tourist spots such as shopping centers, restaurants and public transportation hubs because the number of visitors from non-English-speaking countries was growing" [12]. Most of the complaints came from tourists from Asian countries such as China, Taiwan, Japan, Malaysia, India, Singapore, and Thailand [12].

It seems that language barriers are still a huge obstacle for making decision to travel because it can cause huge misunderstandings, including becoming lost [10]. Bearing in mind that language barrier is the key component that may hinder the inspiration and entertainment of a tourist when visiting a particular destination [8], the objective of this study was to analyze the perception of foreign tourists towards their experiences regarding language barrier in South Korea.

Literature Review

Languages and tourism, as forms of intercultural learning, shape the everyday life of tourism as well as its tactics and strategies [4]. Speaking the language of the visited destination is an obvious advantage which can deepen the potential for tourists' relations with another people and place. However, acceptance or status of English as lingua franca, or the universally spoken and understood language, makes it increasingly unnecessary to learn another language for tourism purposes [13].

The next section discussed language barriers globally and in South Korea.

Global Condition

A survey, carried out by booking site Hostelworld.com, found that 10% of UK adults say language barriers prevent them from travelling abroad; which could be up to five million people [10]. That number rises among younger people aged 18-24, where 15% feel discouraged due to a lack of knowledge about the local language [10].

Sixty-two per cent of respondents said they wished they were better at speaking other languages and had plenty of reasons for doing so. Primarily, they wanted to become more deeply immersed in the country's culture (38%) but also to meet new people (24%) and 21% wanted to use new language skills to help them get off the beaten track [10].

Twelve per cent of respondents say they got embarrassed trying to speak another language because of the amount of misunderstandings they reported [10]. Twenty-one per cent said they had gotten lost on their travels due to a language barrier, 20% of people said they found it difficult to order food, while 9% had even gotten on the wrong train, bus or even plane [10].

It can be concluded that language barrier in the tourist destinations caused problems in getting to the tourist spots, ordering food, getting the right train or bus, shopping, etc. This situation has prevented them to visit non-English speaking country, like South Korea.

South Korea Condition

South Korea is a country where English is not spoken widely [14] which consequently resulted into a lesser-explored destination mainly due to the perceived language barriers [11]. Additionally, one wrong interpretation and reply could get you lost, confused, and maybe even frustrated [21].

According to EF English Proficiency Index, a ranking of countries by adult English skills, in 2016 South Korea has moderate proficiency (54.52%) which is higher than Japan (53.57%) [8]. Most Koreans can understand and speak some English, but they are afraid to try and often run away when asked questions by foreigners [18]. Many Koreans struggle to understand English in actual conversation, as they often don't have the chance to practice.

In major cities, such as Seoul or Busan, language barrier is unlikely to be a problem [9, 18]. In the main tourists spots (like Insadong, Myeongdong, Hongdae in Seoul), there are Tourists Information Center around the area [18] and they can speak English and offer help when someone gets lost by giving a map of the area. However, the farther away from big cities, the less likely everyday people will speak English [18].

Research Methods

This study collected comments regarding language barrier in South Korea from well-known travel guides and travel information to analyze the perception of foreign tourists towards their experiences. In addition, travel logs which contains travelers' experiences in South Korea who cannot read or speak Hangul (Korean characters) were also gathered.

After searching in the internet, there were several travel guides and travel information, namely Lonely Planet, Trip Advisor, and Travel Stackexchange. There were 5 travel logs which were considered meeting the criteria [1, 2, 5, 6, 22].

Content analysis was used to analyze the comments from different travel guides and travel logs. The comments regarding language barrier were classified and coded based on its contents.

Results

There were two main categories, namely language barriers as 1) hindrances and 2) challenges. Each main category has its sub-categories which are discussed with its specific examples.

1. Language Barrier as Hindrances

Language barrier as hindrances have four sub-categories, that is a) communication with local people, b) public transportation, c) supermarket, and d) eating places.

Communication with Local People

There was a very little chance to find people living in the countryside farther away from the big cities, such as Seoul and Busan, who were able to speak English [9, 18, 19, 22]. For example, people in Jeju Island could not speak English [6]. The owner of the lodging could only communicate the basic check-in and payment process. Every further question in regards to directions were getting too difficult.

Some visitors complained and wondered if it is a national policy to use only Korean characters (Hangul) or it is a matter of national pride [19]. For example, in one of the hotels in Itaewon, there was no English words in the bidet toilet seat, as well as the TV remote, bedside master control for all power and clock, and light switches [19].

Public Transportation

Not all taxi drivers knew the locations of some of the museums [18]. In addition, there was a case in which foreign passengers was rejected although it was illegal for a taxi to reject passenger [22].

In Jeju Island, everything in public bus was written in Korean language [6]. Foreign tourists were having a hard time figuring out their destinations, especially during that time there was a change of the bus numbers and routes, which was totally different from the information being searched in advance. An effort to ask the locals or bus driver by pointing to a map and saying the destination all over again got the response of a shaking head, avoiding eye contact, looking into another direction, or not giving any answer [6].

Supermarket

The products in the supermarkets were all written in Korean [6]. In other countries in Asia, the products always had an additional English text with the main information on the packaging, but not so in Korea. It was difficult to guess the pictures because most products were not packed in transparent foil.

Eating Places

In Jeju Island, the restaurants did not have English menu [6]. However, even in the Myeong-dong area (Seoul), the employees in a certain eating places could not speak English at all [18]. There was a case in a restaurant where the waiter managed to point out "chicken" (which might be the only word she knew). It ended up with 3 plates of chicken in which they only ordered two [18]. Another case in a more casual restaurant in Myeong-dong, foreign

tourists had to spent about 30 minutes waiting for a waiter at their table [18].

Picking restaurants that had pictures was not always the best solution, because some of the pictures were not a clear indication of what the food was [18, 19]. A foreign tourist had mistakenly ordered something so spicy which he could only try it for 2-3 bites.

2. Language Barrier as Challenges

There were six sub-categories under language barrier as challenges, namely: a) communication with local people, b) public area, c) place to stay (lodging), d) public transportation, e) shopping outlets or convenience stores, and f) eating places.

Communication with Local People

There was no problem in finding people who could speak English in bigger cities like Seoul although not too much [9, 17, 19]. They could be found in a popular American chain like Starbucks [17].

In major cities, such as Seoul or Busan, there was Tourists Information Center around the tourist area (i.e., Insadong, Myeongdong, Hongdae). The people in the center could speak English and help when someone got lost [18].

Generally, Koreans were quite friendly and willing to help, even when they could not speak English well [9]. There was a case when a complete stranger offered a help when a foreign tourist was seen to be lost. He was accompanied to the target place and given T-money card with enough money to the next train station.

In addition, Koreans were also very eager to teach Korean words and phrases to foreigners [9]. They were more willing to engage in conversations if the tourist was alone, rather than in a group [9]. There were a lot of people who are very understanding and will be willing to help [22].

A great way to practice listening skills and to pick up new words and phrases before coming to South Korea was foreign tourists could watch dramas, movies, variety shows, and listening to Korean music [22].

Public Area

English was not an official language in Korea and therefore Hangul was everywhere: stores signs, posters, menu, remote control, switches [19]. However, there were also many English signposts for

foreigners in the major public areas in Seoul, even for Chinese and Japanese [9, 17, 19], such as airports, train stations, subway stops, shopping malls, famous tourist attractions (Hongdae, Shinsa-dong).

People in the ticket counters (trains, tourist attractions, palaces) mostly knew how to speak English [20]. In the public area, the best target to ask was college students who were more likely to help and practice their English-speaking skills [17].

To avoid having language problem, some tourists had made extra effort to learn the language [19]. Some of them did a little research to learn some of the Hangul alphabets for reading some simple signs [9]. The other used pocket language guide. By doing so, they were able to learn about the culture of places they were visiting.

Furthermore, it was also suggested to get a guidebook to be more independent and overcome the language barrier [9]. Both the Korean tourists guide that was commonly found free around the country and the Moon guide had a nifty translation section in the back [9].

Place to Stay (Lodging)

Booking a hotel was not a problem since majority of hotels had employees that could speak good enough English [16, 18]. The employees were able to communicate as well, even with some difficulty to understand [18].

In a remote location with few populations, speaking in one or two key words or using a few hand gestures to the people who run the lodge had created no communication problems at all [9].

Public Transportation

Seoul has very excellent public transportation with signs and announcement in both Korean and English [17, 20]. The subway was tourist friendly and easy to use [17, 18], therefore, it was easier to use subway as compare to public bus [20].

The infrastructure was outstanding, so a foreign tourist would hardly get lost [17]. When there was a case a tourist got lost, he/she just showed the name of the station and the local people showed the way [18].

In Seoul, a foreign tourist who did not want to talk to anyone should just make a list of the places to visit, then used the subway to get around [17]. Consequently, he/she must buy a T-Money card and topped it up at a Family Mart.

There was no problem to ride taxi, as long as the foreign tourists brought the complete addresses of where to go and the hotel address in Hangul [18]. Some taxi drivers might know a little English with some difficulty [18].

Driving a car did not cause too much of an issue, as nearly all road signs included English names [16]. For other signs that was not written in English, the image was descriptive enough to figure out its meaning but it was better to read up on several road signs along the way. When renting a car, the tourists should also rent GPS with English version [16].

In the Limousine Bus, there was an automatic announcement made on board at every stop from Incheon Airport [18]. By sitting in front of the bus, tourists could hear the announcement. There was also a list of stops on the window of the bus.

There was also a hop-on-hop-off tour bus that circled around major tourist attractions in the city, but using the subway to go to the tourist places usually was much easier [17]. The subway and tourist areas were well-marked with English [17].

The network of public bus was incredible, including the timing. However, when there was a change of bus schedule, it took two hours for a foreign tourist to ask around the locals because no one could speak English. Finally, the tourist found an information office, where he met somebody who could speak English and very helpful, and got the relevant bus numbers to go around the island [6]. He would have not experienced this situation if he prepared a complete address of the locations to visit in Hangul.

Shopping Outlets or Convenience Stores

Shopping in the major department stores was fine. In popular shopping area, such as Myeong-dong, they had someone who could speak English, Japanese, or Chinese on duty in the store at all times [17, 18, 19].

Shopping at the markets or night markets was pretty simple, because most vendors knew the phrase "how much" [18]. It was better to buy souvenirs from stores that had pictures and prices shown to avoid being ripped off [18]. Choosing souvenirs could be done by just pointing to what we want; no need to communicate in the local language [18, 22].

In a convenience store, a foreign tourist could simply take the selected purchase to the register [1]. Most

store employees knew some English and was able to communicate, even with some difficulty [18].

Eating Places

Fast food places that serve Western food, like McDonalds, KFC, Pizza Hut, or Lotteria and most coffee shops, had menus in English as well as Korean [16, 19]. Most of the employees in the fast food places could speak English, not very good one, but at least able to communicate with them [19].

In the larger cities as Seoul, it was easier to choose food without being able to read Korean at the lively food stalls in Gwanjang Market [6]. Some restaurants had English menu, especially those around Myeong-dong [18, 19, 20] due to many international visitors in these areas [19].

Dining was the most challenging part if foreign tourists could not read Hangul [18, 22], especially in an area far away from the major cities. In that case, it was better to visit the food carts with a lot of people and just copy what other people bought [19] which might taste good with a reasonable price.

There were other strategies to buy food as well. The 'point and smile' approach was the simple one [1, 19, 20, 22]. If the restaurant had food pictures, just point to it [6, 18, 20]. If not, just point to the neighbor table which seemed to have some nice food [6]. If the tourists wanted to go to a barbeque restaurant which only had a Korean menu, just went for the first item as it was usually their specialty [19].

The difficult strategy was trying to pronounce the names of the food in Hangul [1]. Consequently, some research in advance should be done to enjoy the widest variety of authentic local Korean food, such as pajeon, kalguksu, kongguksu, dubu kimchee, galbi jim, duck bulgogi, bibimbap, bindatteok, sujebi [9]. Foreign tourists needed to at least read and memorized a few Hangul characters of the food names because most of the local food restaurants did not have English menu [19]. Additionally, it was very helpful to pick up on at least few common phrases (i.e., 물좀 주세요 (Can I get some water), 반찬 주세요 (Can I get some side dishes [Banchan]), as restaurant owners or employees typically speak little to no English [16].

Another strategy was to do some research in advance on restaurants and made a list of places that looked good [9]. In addition, make sure how to get to all of the places and the availability of English menus.

The easiest strategy was to download language application or google translate with reference of copy the Hangul, Romanized, and English names of the selected food [9, 20] which were available for smartphone to learn a few simple phrases. A lot of them could pronounce the phrase in Korean and wrote it in Hangul for helping foreign tourists communicating to the locals. Several free, accessible apps and online resources that could teach the basics of Korean, like greetings, common grammar, and how to order food were LingoDeer or Talk to Me in Korean [22].

Based on the travel experiences of numerous foreign tourists, learning to pronounce some basic Korean words correctly at the minimum and trying to communicate in the host's language was enormously gratifying to make the experience in Korea more unique [18, 19]. The locals felt appreciated and some of tourists got special treatments for that effort [19].

If the previous strategies failed to work, foreign tourists should try using a translation service by calling 1330 from cell phone to get someone from the Seoul city government who could bridge the language barrier [1]. There was also a hotline for English Speakers in http://www.visitkorea.or.kr/ena/GK/GK_EN_2_7_1.jsp [9].

Discussion

This study found that the international travelers who had been to South Korea had perceived language barrier more as challenges (rather than hindrances), either in public are, riding taxi, using subway, dining, or shopping.

The comments being analyzed in this study revealed that although many international travelers could not speak or read Hangul, they still had a great traveling experience. They found that not being able to communicate well with the taxi drivers, waiters in the restaurants or food vendors, etc. was a bit of an adventure [6, 9, 18] which made the trip to South Korea special [6].

South Korea is rich in history, worth visiting for the authentic food, great in technology and subway system [14]. Accordingly, South Korea has become a wonderful place to go [9] with a lot to discover and some unforgettable memories [22].

The people in South Korea in general spoke the least English among Asian countries and it was a rare country in the world in which English was not used in signposts in 99% of the places [19]. However, based on the finding of

this study, language barrier did not prevent international tourists to visit South Korea. The majority of them found various ways to overcome the language barriers by using the simple way until the difficult one. The more difficult was the strategy, the more memorable experiences they had encountered while communicating with the locals.

There were tourists who perceived that language barrier as hindrances because based on the survey results [3], numerous holidaymakers rarely bothered to learn any local words and phrases before visiting a foreign country and did not like visiting hotels abroad if the staff could not speak English. A few tourists would only eat in an establishment with English menus and staff and had walked out of somewhere because they couldn't understand anything [3]. They were not willing to learn new experience even if they had to go through some hurdles, like getting lost, being ripped off by the vendors, eating strange food, etc.

Language barrier is just a 'spicy flavor' which can happen in other countries in which English is used as a second language. It is true that language is important, but it should not be treated as a blockade, as something keeping others out [5]. The purpose of language is to connect to other people and learn the local culture.

Therefore, international travelers should have open-minded when encountering unexpected situations in the tourist destinations. Sharpening intercultural sensitivity is needed to understand local culture and adjust to culture shocks with positive thinking.

Conclusion

The study revealed that foreign tourists perceived language barrier more as challenges rather than hindrances. Language barrier did not prevent them to visit non-English speaking countries, such as South Korea.

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Basic Research for the Development of International Tourism in Japan

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Abstract

This paper is a basic research to explore the development of international tourism in a balanced manner from large cities to local areas from the viewpoint of both software and hardware, from a long-term perspective, rather than a uniform approach, as an increasing number of local governments is trying to promote regional development using tourism as a tool.

In particular, Japan's international tourism has many problems, such as unbalanced tourism, regional disparities in foreign tourists visiting Japan, and the harmful effects of over-tourism. Japan must address these problems to achieve long-term and stable developments. In order to improve these problems, this study analyzed the current international tourism efforts. As a result, we were able to conclude a new direction for the future based on this basic study.

Keywords

International tourism, regional creation, regional tourism

1. Purpose of the Study

The Japanese economy faces a number of problems in the economic environment, including declining population, an aging society with a declining birthrate, and the hollowing out of local cities due to the relocation of domestic production bases overseas. Tourism maintains the vitality of regions through the increasing number of people who interact with each other home and abroad, and is attracting attention not only for social development but also for international mutual understanding through exchanges with other countries.

According to the data of the Ministerial Conference for the Promotion of a Tourism Nation held in June 2014, as a result of the government's concerted efforts to implement the "Action Program for a Tourism Nation", the number of foreign tourists visiting Japan increased to 10 million in 2003, which was the government's goal since the Visit Japan Project was launched in 2013. Based on this background, in order to further promote Japan as a tourism-oriented country on the occasion of the 2020 Olympic and Paralympic Games in Tokyo, the Government will aim to increase the number of foreign tourists visiting Japan to 40 million by 2020.

In addition, it is important to create attractive tourist sites

that can be used in the world, while creating a legacy for the region's strong development even after this target year. It is also important to strategically implement inbound policies through more scientific marketing. It also mentions a strong and positive long-term vision by emphasizing key initiatives to facilitate travels to Japan.

I have no objection to the Japanese government's efforts, and I strongly hope that it will demonstrate its leadership to transcend the boundaries of the tourism industry.

However, Japan's international tourism has many problems, such as lack of tourist tourism, the tendency to rely on foreign capital to handle foreign tourists, differences in policies to attract foreign tourists to Japan, adverse effects of over-tourism, and regional disparities in the number of foreign tourists visiting Japan.

In this paper, a basic research which clarifies the present state for the solution of these problems was carried out. On the other hand, the tendency of foreign companies to handle foreign tourists and the discrepancy in policies for attracting foreign tourists to Japan require long-term coordination among relevant departments. Therefore, I would like to refrain from specifically mentioning this issue in this paper and leave it as the next subject of research.

2. Trends in Previous Studies

Research has shown that there is a trend among previous studies on Japan's international tourism which are either materials that show that the tourism industry can overcome stagnation of the market to some extent through its efforts or research on the existence of special communities in areas related to international tourism and the existence of a business line created through the relationship with local communities. Another trend is that there seems to be a deviation of tourism policies that do not match the actual situations. In addition, there are many papers and studies on political problems which are said to be the reason why the tourism industry cannot be involved and the decrease of the number of tourists caused by groundless rumors.

These major trends in existing research have expanded the focus of my research on international tourism, which used to be mainly between Japan and neighboring countries such as South Korea, to a third country or region, and have significant implications for identifying problems in current international tourism initiatives and proposing directions for solving them.

3. Analysis of the Current Situation of Various Problems International Tourism in Japan

In the Competitiveness Ranking of Tourism (141 countries and regions) released by the World Economic Forum in May 2015, Japan ranked 9th, up from 14th in the previous survey in 2013, placing itself among the top 10 for the first time after the first research in 2007. "Railway infrastructure" and "Responding to Customers" were rated No. 1. In addition, Japan's number of foreign tourists and revenue from international tourism are rising.

The government has set a target of accepting "60 million in 2030", but when the number reaches around 20 million, the shortage of air networks and accommodations will become evident and there are concerns that the quality of travels will deteriorate.

At first glance, it seems that the consumption of foreign tourists is having a large ripple effect on the local economy, as it has been evidenced by reports of Chinese tourists' explosions, and that Japan's tourism industry, including attraction of foreign tourists, is doing well, but this is not the case given the sluggish labor productivity of the travel industry. The present states of main problems as discussed above in the purpose of this paper will now be described.

(1) Unestablished Status of Tourism

Looking at the changes in the number of foreign visitors to Japan and Japanese overseas tourists from 2000 to 2018, the number of Japanese overseas tourists was large from 2000 to 2014, and since the first time that the number of foreign tourists to Japan exceeded that of Japanese overseas tourists in 2015, the trend of foreign visitors to Japan has been dominant until today. The number of foreign visitors to Japan increased rapidly around 2013, when the number of foreign visitors exceeded 10 million for the first time, and the number of Japanese tourists, which showed a rapid increase in reaction to the drop in 2003 when the SARS epidemic occurred, continued to grow and decrease, but it is showing a tendency of slackened growth and continuing imbalanced condition in view of two-way tourism.

<Table 1 Trends in the number of foreign visitors and Japanese tourists to Japan (2000 – 2018)>

Year	Number of Inbound Tourists	Increase/Decrease from Previous Year (%)	Number of Overseas travelers	Increase/Decrease from Previous Year (%)
2000	4,757,146	7.2	17,818,590	8.9
2001	4,771,555	0.3	16,215,657	▲9.0
2002	5,238,963	9.8	16,522,804	1.9
2003	5,211,725	▲0.5	13,296,330	▲19.5
2004	6,137,905	17.8	16,831,112	26.6
2005	6,727,926	9.6	17,403,565	3.4
2006	7,334,077	9.0	17,534,565	0.8
2007	8,346,969	13.8	17,294,935	▲1.4
2008	8,350,835	0.0	15,987,250	▲7.6

2009	6,789,658	▲18.7	15,445,684	▲3.4
2010	8,611,175	26.8	16,637,224	7.7
2011	6,218,752	▲27.8	16,994,200	2.1
2012	8,358,105	34.4	18,490,657	8.8
2013	10,363,904	24.0	17,472,748	▲5.5
2014	13,413,467	29.4	16,903,388	▲3.3
2015	19,737,400	47.1	16,212,100	▲4.1
2016	24,039,700	21.8	17,116,420	5.5
2017	28,691,073	19.3	17,889,292	4.5
2018	31,191,900	8.7	18,954,000	6.0

□□Source: Written by the author from Japan Tourism Agency data

Looking at the number of foreign visitors to Japan in 2018 by nationality, four East Asian countries, namely South Korea, China, Taiwan and Hong Kong, topped the list. A comparison between 2010 (Figure 1) and 2018 (Figure 2) shows that the increase in the number of tourists from the four above-mentioned countries supported the inbound market.

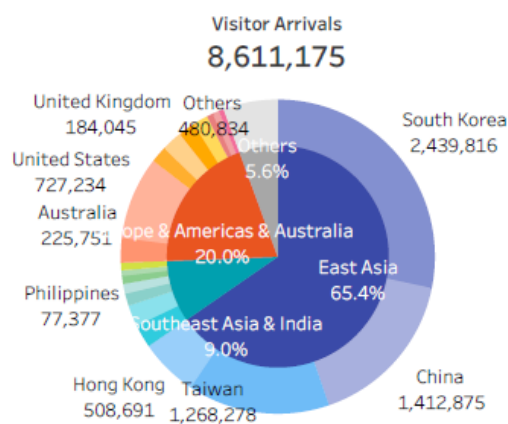


Figure 1: The number of foreigners visiting Japan by country in 2010



Figure 2: The Number of foreigners visiting Japan by country in 2018

Source: Japan National Tourism Organization (JNTO)

(2) Regional Disparities in Foreign Tourists visiting Japan

According to a survey by the Cabinet Office, the number of foreign tourists visiting Japan increased about 3.4 times between 2012 and 2017, but the share and growth rate of Tokyo, Osaka, Kyoto and Chiba Prefecture (where Narita International Airport is located) are large, showing that the contribution of these four prefectures to the number of tourists is very high. The increase in travel consumption is more pronounced. While nine prefectures - Tokyo, Osaka, Hokkaido, Kyoto, Fukuoka, Chiba, Aichi, Okinawa and Kanagawa - have shown a significant increase in both the rate of increase and the amount of consumption, the remaining 38 prefectures have shown only a small increase in the amount of consumption (Figures 3 and 4).

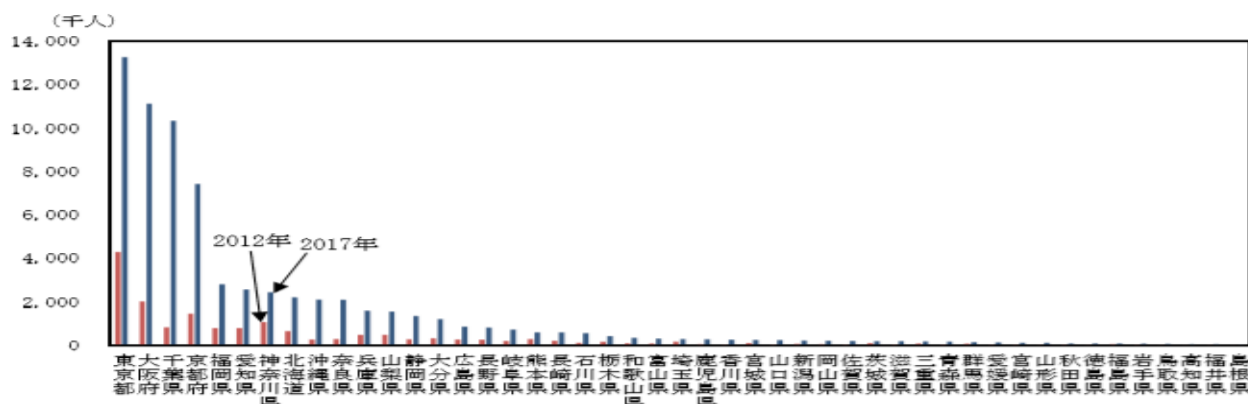


Figure 3: Number of inbound travelers by prefecture

Source: Cabinet Office economy 2018

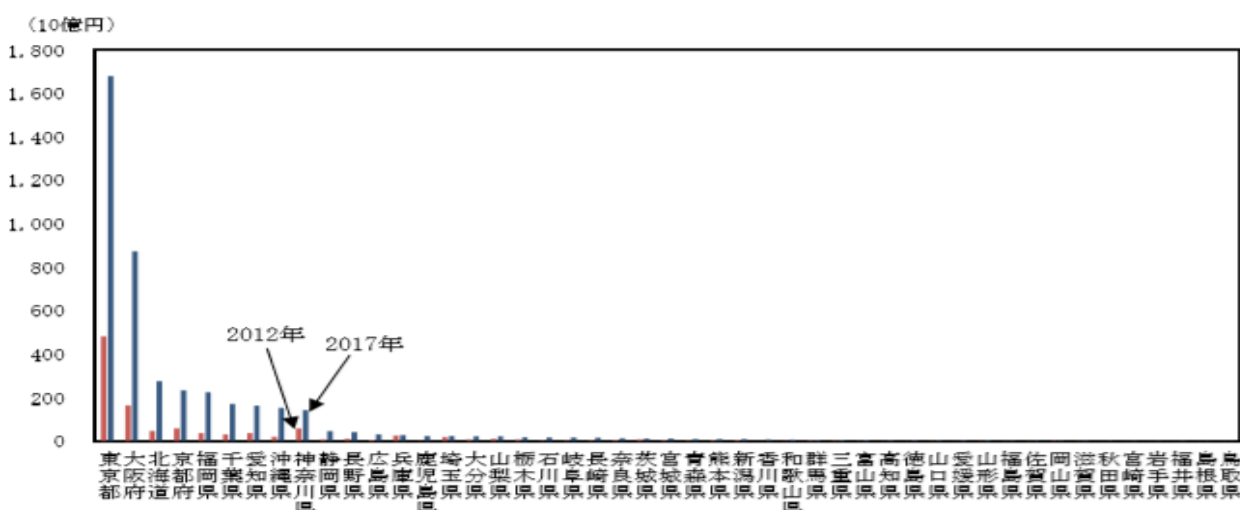


Figure 4: Inbound consumption amount by prefecture

Source: Cabinet Office economy 2018

(3) Adverse Effects of Over-tourism

Over-tourism refers to a phenomenon in which an increase in the number of tourists and the concentration of tourists in a particular area cause the amount of tourists in a particular area to exceed the permissible level, which adversely affects the lives of local residents and causes problems such as a decrease in the satisfaction of tourists. This problem has become apparent at sightseeing spots where the number of foreign tourists, such as Kyoto City, is rapidly increasing.

i) Congestion in Tourist Areas due to Concentration of Foreign Tourists

In Okinawa Prefecture, where it is common for foreign visitors to travel by rental car, the increase in traffic as well as accidents due to differences in traffic regulations have become a problem. In Kyoto, where route buses are often used for sightseeing, the concentration of foreign tourists on route buses caused local residents, who were the original users, to avoid using them.

ii) Manners of Foreign Tourists

The increase in garbage littering, graffiti on buildings and parking on streets has led to lower satisfaction among Japanese and foreign tourists.

iii) Changes in the Living Environment of Residents due to an Increase in the Number of Foreign Tourists

Due to the increase in the number of foreign tourists, there have been reports of problems that may affect the satisfaction of local communities and communities, such as the hoarding of daily necessities, rising prices, problems with garbage, noise, etc., problems with manners, and traffic congestion.

4. Future Directions of International Tourism from the Current Situation Analysis

The current status of international tourism in Japan has been analyzed. On the basis of this basic examination, new future direction is inferred and described.

- (1) Japan's neighbors, South Korea and China, have long been politically involved in international tourism as Japan's main partners (Territorial rights, the problem of so-called "comfort women" during WW II, distortion of contents of textbooks, North Korea's nuclear development, etc.), but they have repeatedly been confronting and then maintaining friendly relations without finding a clue to a solution. However, in terms of international tourism, the three countries have been trying to overcome political problems and to seek a complementary relationship while also trying to co-exist and co-prosper through peace. It is necessary to draw attention to the fact that the three countries are highly dependent on each other in terms of international tourism and to build a framework to promote international tourism based on this common recognition.
- (2) The realization of a tourism-oriented nation is considered to be an indispensable national task for the economic and social development of major East Asian countries in the 21 century. Therefore, it is necessary for the government to promote measures for realizing a tourism-oriented country, and it is necessary to clarify organizations responsible for tourism administration and to establish a system to enable execution of functional and effective duties. The establishment of such a system is not limited to just one country, but also forms an organic relationship by establishing a common multilateral consultative organization.

- (3) The "New Growth Strategy" which was decided by the Cabinet on June 18, 2010, was one of the seven strategic areas for the revival of a vibrant Japan by taking advantage of the rapidly growing tourism demand in Asia, breaking through the stagnation of the population and the low birth rate and aging of the population in the long economic slump and showing the recovery and style of international tourism and the rich tourism resources in the region.

In addition, in light of the recent changes in the situation, the necessity of taking concrete and practicable measures is gradually coming to the surface in order to comprehensively and systematically promote measures for the realization of a tourism-oriented nation and to achieve the development of the national economy and the stabilization and improvement of people's lives. In order to overcome this situation, it is indispensable to develop a practical program for international tourism.

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Process Innovation of Social Media Communication Plan: A Case of Thai Hotel SMEs

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Abstract

Social media has been widely adopted in marketing communication worldwide due to its values of interactivity and individualization, integration of communication and distribution channels, immediacy and information collection. However, effectively applying social media marketing communication (SMMC) in the organizations to increase their competitiveness has still been a challenge especially in small and medium enterprises (SMEs). SMEs are positively aware of social media values, nevertheless most of them do not properly formulate a strategic plan development with effective process on how to implement SMMC with justified return on investments under dynamic, fast-changing and data-driven market condition.

While hotel SMEs is a strategic growing segment in Thailand, thousands of them are also facing such similar challenges of leveraging SMMC to create competitive advantage to grow their businesses.

This paper, therefore, proposes a conceptual framework of process innovation in improving social media marketing communication plan effectiveness for hotel SMEs in Thailand.

Keywords

Social Media, Social Media Communication, Marketing Communication, Big Data, Process Innovation, Hotel SMEs.

Introduction

Following the same global social media growth trend, 74% of population are currently active social media users representing over 51 Million in Thailand (Hootsuite, 2018). The ISMED research indicated Thai Internet users spent their time online at an average of 6.30 hours per day in 2017. The top five most activities include using email, search content and information, spending time on social media, reading online and watching online TV/listening to online Music. Average amount of time per day spent using social media in Thailand was 3 hours and 11 minutes.

93% of Internet users using Facebook while 91% were on YouTube and followed with 65% on Instagram and 52% on Twitter. Bangkok, the capital of Thailand, was ranked the highest number users of Facebook in the world with 22 Million accounts (Hootsuite, 2018). In addition, the top content format that can create most consumer engagement on Facebook were VDO (9.32%) followed with Link (7.16%).

Due to its high market penetration, Social media has therefore been widely used in marketing communication of corporations (Killian & McManus, 2015) in order to

develop effective marketing capability to effectively communicate with their users/consumers, create more revenues and eventually build strong organizations' competitive advantage (Michael John Valos, Haji Habibi, Casidy, Driesener, & Maplestone, 2016; Michael J. Valos, Maplestone, Polonsky, & Ewing, 2017). Social media technology allows corporations to communicate, listen to comments and feedbacks, understand attitude and learn customers' needs instantly without any boundary of geography in communication. Social media has also benefit two-way communication with interactivity, fast collaboration and efficient data collection (Kaplan & Haenlein, 2010). Jones, Borgman, and Ulusoy (2015) studied impact of social media on small businesses and found that social media marketing communication can improve product awareness, strengthen relationship with customers, acquire new customers and build strong brand image to expand into both global and regional market (Alalwan, Rana, Dwivedi, & Algharabat, 2017). The study research of Schaupp and Bélanger (2014) also indicated the similar social media value of capability improvement in marketing, sales, productivity and efficiency in organization while Ainin, Parveen, Moghavvemi, Jaafar, and Shuib (2015) additionally stated the impact of social media not only includes in monetary but also non-monetary value like customer relationship management.

While SMEs fully recognize values and impacts of social media in marketing communication in their organization (WHY) needs to do, majority of them don't fully understand (HOW) to strategically plan and (WHAT) components and actions to be implemented to maximize SMMC effectiveness. McCann and Barlow (2015) indicated 65% of Scottish SMEs cannot systematically plan their social media communication, measure the effectiveness of marketing investment (Kumar & Mirchandani, 2012). Keegan and Rowley (2017) also indicated an effective planning process of social marketing communication requires a systematic integration of right measurement and evaluation into every working steps to support better decision making.

Shinnasin Klangthong, Social Media Group Head at Interpublic Group (IPG) Thailand shared their best practices "To achieve an effective SMMC, the organizations need to be able to listen to consumers, understand their insights real time and apply data intelligence into marketing communication process. It is critical for organizations to build their own customer data profile to manage good

relationships with them and externally integrate targeted social media users' profile from 3rd party data source like interests and lifestyle which are normally acquired from social listening tool into the right marketing process framework with measurement, evaluation and real time optimization according to corporate goals and objectives."

Travel industry has been considered as one of the key strategic market segments in Thailand representing 17% of total GDP with a value of more than THB 2.5 Trillion in 2017. The numbers of tourists have been growing at 15% per year and expected to reach to 41.5 Million in 2020 (Krungsri Research Center, Hotel Business, 2017). Total Thai hotel business revenue was at THB 544 Billion in 2016 and growing with a double-digit year over year (Kasikorn Research Center, 2016). However, most of Thai hotels especially SMEs could not manage their rooms to maximize occupancy. The average occupancy rate of industry showed only 59% during 2000 to 2014 and slightly improved to 68% in 2016 (Ministry of Tourism and Sports, 2017). The challenges are mainly driven from acquiring new customers with an effective cost and maintaining good relationships with old customers for re-purchase or engagement with the hotels under current fast-changing consumer behaviors of various fragmented social media platforms.

The president of leading small hotel chain, Hop Inn said "The company would like to expand our based customers and implement our own customer relationship management system. We therefore create our own social media channels to reach that goal but unfortunately our working team cannot effectively implement SMMC. They don't understand how to formulate the right strategy, process, measurement and lack of data or insights to make proper decisions. Our social media channels are still inactive with only few reach and engagement. We sometime hire digital media agency to learn their business practices but not often due to a high service fee. In addition, we also faced difficulty managing timely responsive coordination with the media agency which not allows us to quickly respond to our consumers"

Panjanin Mongkonrattanawong, the owner of Klub Hotel and Budacco hotel in Thailand shared "Our hotels mainly much depend our sales channel on Online Travel Agency (OTA) like Agoda and Booking. It is an effective channel offering the pay per performance model (only pay when achieving sales) but they ask in return with quite a high commission fee at the average of 20-25%. We want to

build and manage our own social media channel to reduce the dependency on OTA, but we don't know the effective way of HOW to properly implement SMMC. Using professional digital marketing service is costly and closely working with them to achieve our marketing objectives is quite also a challenge. We don't therefore use the media agency to manage SMMC for us."

Sirote Tulsook, the founder and CEO of Chillpainai, the leading Thai social tourism community said "We have seen a big growth opportunity of Thai hotel industry over the long term if we can develop an effective tool or system to help hotel SMEs manage their own SMMC"

This research aims to propose a conceptual framework of process innovation model of social media marketing communication plan by studying hotel SMEs in Thailand. The proposed framework model will apply industry and market data, business practices from industry experts, concepts, strategies, theories and integrate with proper social media and big data technology to improve SMEs' marketing communication capability. The study will contribute the new way for SMEs to easily and effectively manage their own SMMC which will drive their business growth and efficiently utilize their marketing resources. The model will abundantly benefit to marketers, business owners, media planners, government agencies and social media service providers. The model will be correspondingly suitable for other hotel related-service industries.

Marketing communication process and media advertising agency

The basic principle of marketing communication mainly consists major components including; two main parties of Sender (Source) normally including company, brand or agency and Receiver (Target) by delivering Message or brand messages of planned, unplanned, product and service through Media (channel) in any form of Internet, newspaper, mail, magazine, e-mail, TV, radio. Duncan (2002) proposed an interactive marketing communication model indicating the two-day communication loop by company/brand can receive the feedback from audience to show any expression and intention whether to buy/not buy or request any information. Most of the time marketing communication would not be effectively implemented due to the interruption of noises including clutter, message conflict and inconsistency in the communication loop between sender and receiver. The model of interactive

marketing model can be shown in the Figure 1:

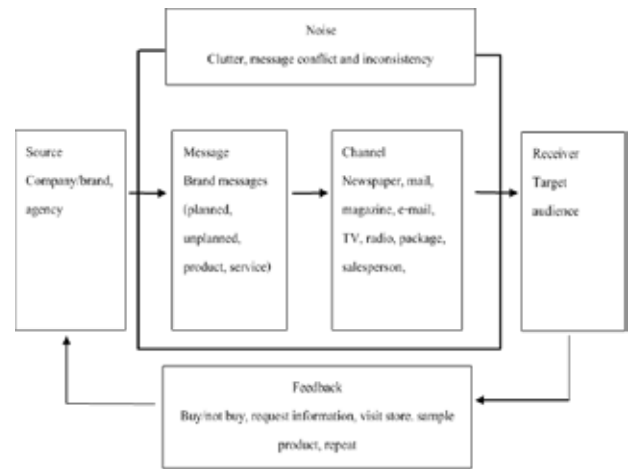


Figure 1 - An Interactive Marketing Communication Model (Duncan, 2002)

Due to difficulties of effectively managing marketing communication, media advertising agencies were established with their specific expertise in communications to help brand and company to systematically manage such challenges.

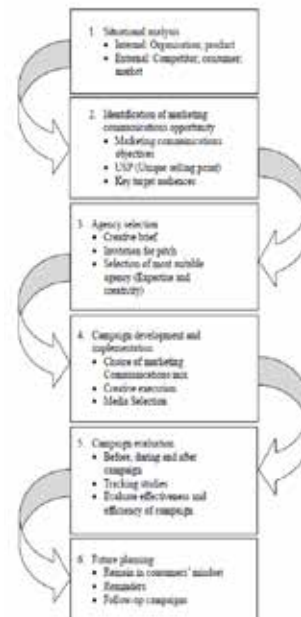


Figure 2 - Stages in the planning and implementation of IMC: Renault using media agency (Caemmerer, 2009)

Caemmerer (2009) showed the real-life case study of how media advertising agency manage integrated marketing communications to achieve brand, company goals by illustrating all the tasks and process involved in the planning and implementation. The framework was adopted from business practices by a media agency providing integrated media services to brands and organization in returns of

servicing fees. The Figure 2 clearly shows steps by steps of integrated marketing communication implementation and planning: a case study of Renault brand repositioning using media agency service.

Social media marketing communication

Social media marketing communication (SMMC) is defined as using technology of social media as a channel and software to create communication to deliver and exchange messages or content for any values to related parties in the organizations (Tuten & Solomon, 2017). From their research study, Felix, Rauschnabel, and Hinsch (2017) defined successful planning and implementation of SMMC requires cross-functional collaborations within organization integrating with other communication tools to accomplish corporate goals which are aligned with corporate culture and resources.

Social media characteristics, values and challenges

Effective Implementation of social media requires understanding its characteristics to be utilized for benefits and its challenges in managing under real environments of a lot of noises of message/content and dynamic of consumer behavior as well as several social media channels in online world of marketing communication. Michael John Valos et al. (2016) described four key social media characteristics and values which perform better than traditional media to the corporations as follows:

1.) *Interactivity and Individualization*: Social media allows to create two-way communication focusing on user generated content, internally and externally sharing across or outside organizations to promote brands and customer relationship (Ainin et al., 2015; Killian & McManus, 2015; Singaraju, Nguyen, Niininen, & Sullivan-Mort, 2016)

2.) *Integration of communication and distribution channels*: Social media provides easy and smooth integration of communication and distribution channels in organization across marketing, sales, advertising and PR (Ainin et al., 2015; Killian & McManus, 2015)

3.) *Immediacy*: Social media provides a capability to manage customers 24*7 which can instantly listen, monitor, and observe consumer behaviors. This helps quickly respond to marketing activities and lead to viral marketing or word of mouth in sharing to other audiences (T. Wang, 2017; Z. Wang & Kim, 2017).

4.) *Information collection*: Social media is used as a researching tool to collect consumer data and insights to understand their thinking, emotion, interest and attitude to support decision in effective marketing communication planning (Bekkers, Edwards, & de Kool, 2013; Mayeh, Scheepers, & Valos, 2012).

While social media significantly benefits organizations as stated above, Hofacker and Belanche (2016) showed in the study of the eight challenges of how to successfully implement social media marketing among marketers among fast changing of consumers' behaviors, fragmentation of data and media channels. The eight challenges included: 1) *liquidation of economy* stating adaptation within boundaryless of economy; 2) managing complicated *multi-sided markets* and using big data and cloud technology; 3) *dynamic consumer to consumer* (sender-receiver system) resulted from wide adoption of electronic word-of-mouth from social media; 4) managing large and fragmented *customer creation and engagement*; 5) managing *changing customer journey* from advanced technology; 6) adapting more *reactive marketing management* due to social media big data requiring to monitor consumer behaviors and attitude; 7) *changing marketing skill set* to support complicated and fragmented data (various format of text, picture, VDO, liver streaming) as well as changing measurement model; 8) *gamified integration* driving changing business model on marketing and advertising from growing online game market. The Figure 3 shows the framework of eight social media challenges leading forces from the changing economy, consumers and firms.

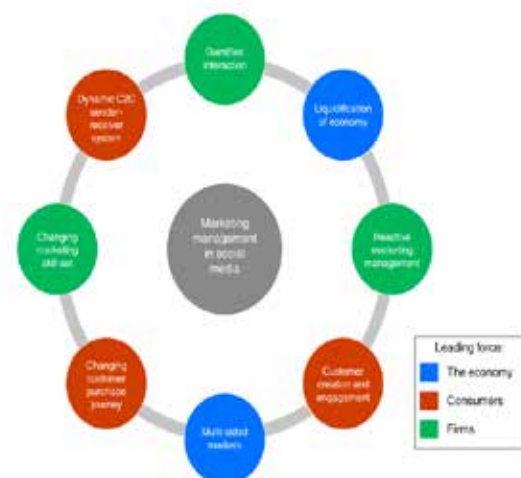


Figure 3 - Framework of eight social media challenges for marketing managers (Hofacker & Belanche, 2016)

Adapting both values and challenges in managing social media, Michael J. Valos et al. (2017) also indicated in the research study for a step-by-step framework of how to create an effective process of social media communication to guide any marketers for better decision support to accomplish organization marketing purpose. The model integrated: 1) *decision-making process* of strategic communication decisions, tactical communication decisions and evaluation with 2) *social media unique strengths* of engagement, agility, reach and listening to aligned with 3) *social media implementation enablers* of social media integration with strategic role clarity and corporate resources. The complete framework of social media integration within an integrated marketing communication (IMC) decision-making can be clearly illustrated in the Figure 4.

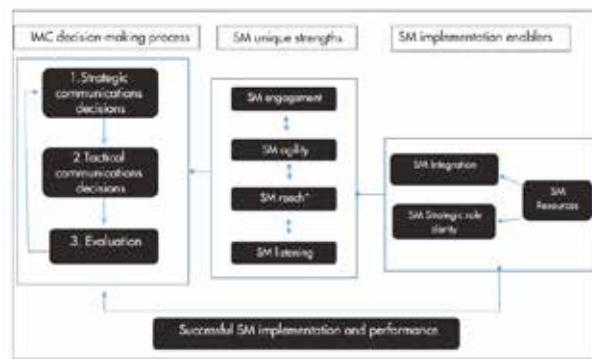


Figure 3 - IMC SM marketing capability model.
Note: * = SM strength identified in phase two

Figure 4 - Integrating social media within an integrated marketing communication decision-making framework
(Michael J. Valos et al., 2017)

Social media marketing communication for SMEs

SMEs are meaningfully aware how SMMC can value their organization but how and what to effectively implement and measure for satisfied return on investment (ROI) are still the challenges to pursue (Keegan & Rowley, 2017; Kumar & Mirchandani, 2012; McCann & Barlow, 2015)

McCann and Barlow (2015) proposed a simple three steps of an SMMC model for SMEs incorporating with specific measurement for campaign success. The process includes: 1) *Planning* of goals setting, objective defining and metrics identification; 2) *Implementation* of appropriate social media tools according with on-going social media analysis both quantitative and qualitative aspects; 3) *Evaluation* of both short-term and long-term benefits to evaluate ROI of marketing campaigns. The

simple three-step framework is visibly demonstrated in the Figure 5.

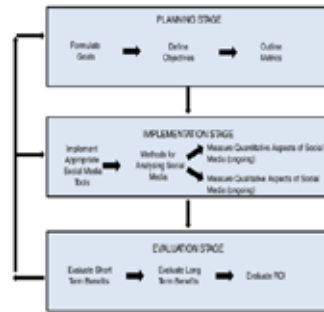


Figure 5 - An overarching framework that provides direction for SMEs to measure ROI of social media
(McCann & Barlow, 2015)

Social media consumer behavior and Big data

Understanding audiences/consumers is one of the key components to make successful SMMC. Zhang and Benyoucef (2016) completed the literature review study of key factors and decision-making process of how consumers respond to social media content and messages starting from pre-purchase through purchase and after purchase stages. The study identified the complete framework for consumer behavior in social commerce of how message/content influence consumers to respond actions in all stages of buying decisions. The model included factors of: 1. *Stimulus* characteristics (Content, Network, Interaction) to stimulate factors of; 2. *Organism* (personal traits, value perception, affections, self-oriented perceptions, social/relational-oriented perceptions) by indirectly influenced by the factors of; 3. *Moderators* (content type and culture) to drive to each step of; 4. *consumer response* and action stages (need recognition, search, evaluate, purchase and post purchase). The Figure 6 illustrates the complete social commerce framework for consumer behavior.



Figure 6 - Complete theoretical framework for consumer behavior in social commerce (Zhang & Benyoucef, 2016)

Consumer behavioral insights can be analyzed through social media data feed through various social media platforms (big data). Social media big data consists of content/message feed incorporating with timing, content format and measurement metrics of consumers' behavioral reaction on various types of communicating message/content given any specific period. The insights allow the marketers to understand target consumers and can strategically develop message/content in the right type/format to distribute through the right social media channels at the right time to match the right target audiences to align with their corporate goal, marketing objectives and cultures on a timely basis (Victor A Barger, 2013). The study of social media metrics in various social media platforms in consumer decision process can be illustrated in the Figure 7.

Platform	Posts (Feed)	Expressing agreement	Rating	Voice opinion	Sharing WOM	Data collection Excluded
	Primary content with which users interact	Simple expression of agreement with a post	Simple evaluation of a post	Statement of one's opinion with respect to a post	Sharing of a post with others on the same platform	
Facebook	Status updates	Like		Comment	Share	Demographic, private data
YouTube	Videos	Like	Dislike	Comment		Demographic
Instagram	Photos	Like		Comment		Demographic
Twitter	Tweets	Favorites		Reply	Retweet	Demographic

Figure 7 - Social media metrics on posts(feed) in various social media platforms (Victor A Barger, 2013)

He, Zha, and Li (2013) suggested three steps of text mining process to analyze social media big data from various social media sites by: firstly extracting and collecting social media and; secondly applying text mining including extraction, categorizations and; lastly clustering to get actionable intelligence results in the final step including a model of patterns, opportunity, issues, and trends which result in recommendations and actions. Text mining process can be shown in the following Figure 8.

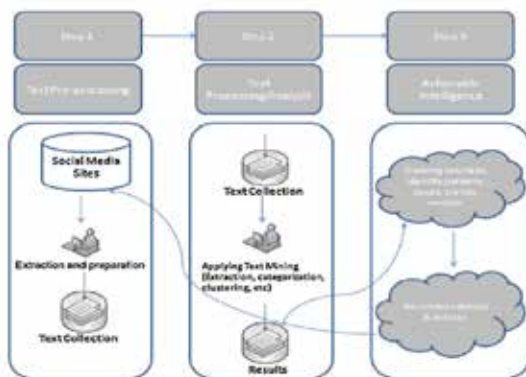


Figure 8 - Text mining process for social media big data content (He et al., 2013)

Leung, Bai, and Erdem (2017) researched 12 hotel Facebook pages for 1,837 content analysis for the study of message and content strategy and its effectiveness of hotel social media marketing. The study found two types of message strategies including 1) *message format* (word, picture, web link and video) 2) *message content* (product, promotion, reward, brand, information and involvement).

While medium hotel preferred using reward message, small hotel preferred using message in word. The large hotel, however, favored the usage of web link and VDO on their promotion messages.

Furthermore, Dolan, Conduit, Fahy, and Goodman (2017) found in their research that 4 content types can influence consumers' engagement on social media communication including informational, entertaining, remunerative and relational needs. Each type of content attracted different engagement from consumers on Facebook and depended on different timing and date of published content.

Social media communication planning solution framework

The authors made a survey from the media agency expert IPG Thailand and leading social travel community Chillpainai and 4 brands of Thai Hotel SMEs. The study clearly showed two current types of social media marketing communication implementation which both indicating some challenges facing the organizations.

1.) *Operating SMMC by internal team (in-house)* Most of Hotel SMEs operate SMMC on their own team since they do not have enough funding to invest in using media agency to help manage SMMC. However, they secure their sales generation by using services from OTA like Agoda or Booking, who provide total marketing solution with proven sales success but in exchange with high commission fee ranging from 20-25% on successful transactional sales. The SMEs challenges on own SMMC operation resulted from: 1) a lack of understanding the right strategy and implementation process; 2) a lack of knowledge on trends opportunities and best practices to formulate strategy 3) not being able to properly acquire consumer data to support decision and 4) too much dependency on OTA. The whole business flow of in-house operation mostly seen in hotel SMEs can be illustrated in the Figure 9.

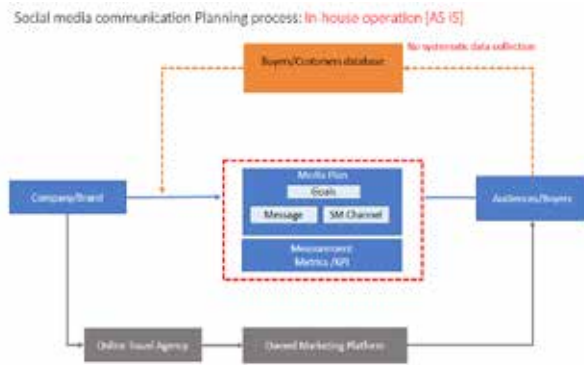


Figure 9 - Current SMMC planning for hotel industry using in-house operation

2.) *Operating SMMC using Media Agency* Most of medium and large Hotels hire media advertising agencies to manage SMMC while also leveraging OTA channels to generate sales as still proven one of effective sales channels. The media advertising agencies provide: 1) recommendation on social media planning and implementation 2) systematic planning with strategy formulation 3) various tools incorporating with updated consumer and market data to support decision-making. Nevertheless, the organizations have still had some difficulties in closely working with agencies (Keegan & Rowley, 2017) resulted in slow response with consumers and sometime resulted in unsatisfactory consumers feedbacks. The current social media communication flow using external media agency can be shown in the Figure 10.

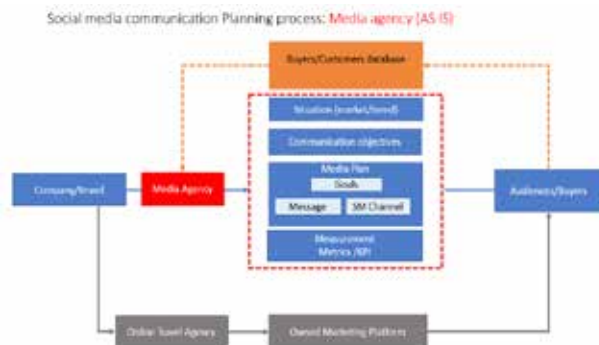


Figure 10 - Current SMMC planning for hotel industry using external media agency

This research aims to propose the new solution to resolve current challenges of SMMC implementation for Thai hotel SMEs. The key proposed solution highlights include proposing new systematic SMMC planning process integrating with big data technology to intelligently provide valuable data of consumer behavior, market, competition, opportunity, trend and issues into SMMC planning, implementation, evaluation and

optimization. Decision support tool will be developed to allow organizations to easily manage the SMMC process at their convenience. The Figure 11 illustrates the new proposed solution of SMMC for Thai hotel SMEs.

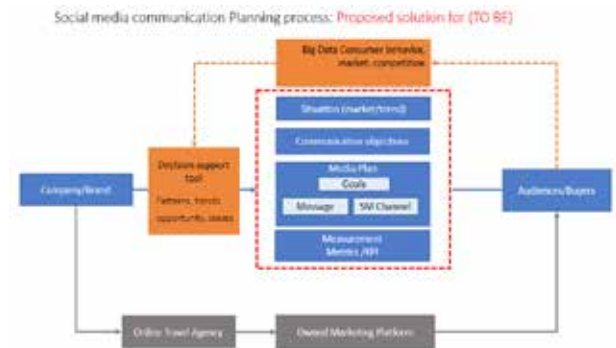


Figure 11 - New proposed solution of SMMC planning for Thai hotel SMEs

Consequently, the study develops a conceptual framework of process innovation of SMMC which resulted from the development of simplified SMMC model according to best practices incorporating with social media big data and text mining technology to develop consumer behavioral insights. The conceptual framework is illustrated in the Figure 12.

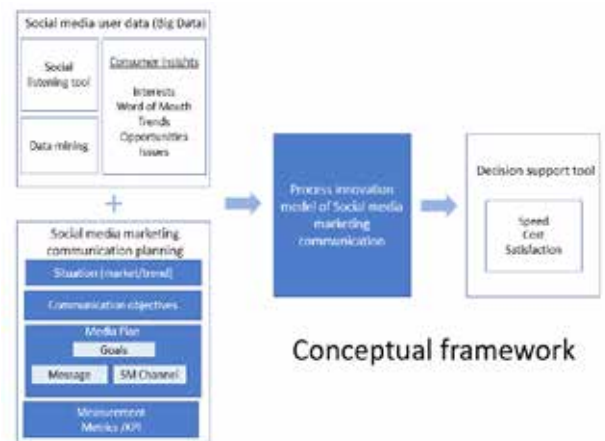


Figure 12 - A conceptual framework enabling process innovation of SMMC planning for Thai hotel SMEs

In summary, the model creates the new initiative process of SMMC for Thai hotel SMEs to increase their marketing capability and competitiveness and will correspondingly support the new development of an online decision supporting tool to benefit marketers, media planners and business owners to effectively manage and implement their SMMC. Moreover, the proven model will similarly be practical with other hotel-related service providers SMEs.

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The Components of Knowledge Intensive Business Services (KIBS) model for Food Safety Management System (FSMS) in the hotel

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Abstract

Due to the outbreaks of foodborne illness, the number of outbreaks is continuously increasing and costs from food-borne illnesses from food service businesses in the global low-middle income countries has an average of 110 billion US dollars per year were reported by WORLD BANK in year 2018. Thus, to eliminate business risks, this research is commencing to study the components of new food safety management system (FSMS) learning platform in Knowledge-Intensive Business Services (KIBS) firm in the form of a qualitative research by using in-depth interview. Eighteen of luxury and upscale hotels and 2 knowledgeable service provider companies were interviewed. The keys of success that help driving the food safety management and enhance continuous improvement in the hotel are a group of experts who provide advice on food safety management systems (P-KIBS), technology systems that are used to link communication information (T-KIBS) and process control and analysis.

Keywords

Knowledge-Intensive Business Services (KIBS), Food Safety Management System (FSMS), Technology-oriented KIBS (T-KIBS), traditional professional services (P-KIBS)

Introduction

Food and beverage services sector contributes greatly to the profits in hospitality industry. Effective food management system: including procurement, quality control, storage, processing, and service, is necessary due to increasing occurrences of Outbreaks of Food born illness. In 2018, the New World Bank studied the burden of the world and found that food-borne diseases were disproportionate to children under the age of 5 and the population of low and middle income countries in Asia. And Africa Including countries with low to moderate incomes expected to be affected by the loss of approximately US \$ 95 billion per

year because of unsafe food(Jaffee, Henson, Unnevehr, Grace, & Cassou, 2018; Zhang et al., 2014). Although, many experts from public sectors, universities, HACCP organizations, and related research institutes are trying to work closely together in order to build a safe food standard for food & beverage services sector (Wu, 2012), it has also identified other factors are knowledge, attitudes and practices for creating sufficient knowledge, positive attitudes and adequate practices that can be decreased risk of foodborne diseases (Zanin, da Cunha, de Rosso, Capriles, & Stedefeldt, 2017). In addition, the Middle-Upscale Business Hotel segment has implemented the food safety system to prevent the risk of businesses that

organize seminars and, international tourism businesses. However, food safety management in accordance with HACCP and ISO22000 may not be suitable for some food business due to internal and external communication management standard requirements, and audit systems that are too complex (Charalambous, Fryer, Panayides, & Smith, 2015).

Furthermore, the linkage of innovation management internal and external of the organization is a strategy that will increase the efficiency of the food safety management in the hospitality industry. This is consistent to the research that summarizes the definition of the term “Knowledge-Intensive Business Services (KIBS)”. Knowledge-Intensive is defined as knowledge and specialization of the training in crucial areas and business is defined as providing information, rather than focusing on the production or final service activity, and the customers can be both small to large businesses, charitable organization, and public sectors. Services can be defined as services that affect tangible things by using intangible factors such as software, information system, communication, and system management (I. D. Miles, Belousova, & Chichkanov, 2018). Consequently, the strategy of Technology-oriented KIBS (T-KIBS) includes the service of knowledge management of experts in computer systems, engineering, and research and development. (T-KIBS), linked with traditional professional services (P-KIBS), is an alternative for innovation management to combine for promoting the business operations for customers and/or users on (Doloreux, Shearmur, & Van Assche, 2019).

The future of the food safety management system in the hotel can be relied on improving the gap between the operational knowledge of the food business and the supervising expert (Ovca, Jevšnik, Kavčič, & Raspor, 2018). Consequently, the important factors are knowledge, attitudes and practice can be preventing foodborne illness in the food business more effectively. Therefore, the purpose of this study is to explore successful factors/ components of KIBs model for a sustainable and internationally recognized food safety program of the hotel business to receive for its sustainability internationally recognition.

Theoretical Background and research questions

Food safety management system in hotel

The factors of food safety management system implementation in top hotels. It is found that a top management would make their decision on this, based

on their vision of food safety (Wu, 2012). Trainings background and their expertise are important key success factors of food safety management in the hotel (Baser, Ture, Abubakirova, Sanlier, & Cil, 2017). This is also aligned with Rossi, Stedefeldt, da Cunha, and de Rosso (2017) were studied on food handlers involving in food preparation to food serving can bring in a risk of food contamination or poisoning, affecting business reputation and a loss of profit.

Meyer et al. (2017) explained that understanding of the barriers to communication and trust is imperative of food safety can gain trust from consumers. Therefore, food business owners or management are careful to handle the food safety properly. Hence, the first research question (RQ) to exploit involves the following.

- RQ1: How food safety management system is implementing to hotel business?

Moreover, Lack of knowledge about HACCP and other food safety programs were identified as the main barriers for food safety in food businesses (Baş, Yüksel, & Çavuşoğlu, 2007). There are critical factors deemed necessary by owners/senior managers and food safety managers/coordinators to implementing a food safety program, and having external resources and support, involved employees, effective communication and the right food safety staff. Participants in the pilot project also identified motivation to complete the implementation within the timeframe required by the project (Wilcock, Ball, & Fajumo, 2011). In addition, the level of food safety knowledge and major knowledge gaps among food handlers are related food-borne diseases and cross contamination. Thus, qualified staffs are key to success and innovative food knowledge strategies should offer a wide spectrum of training formats (Smigic et al., 2016). However, The management of food safety across all sectors in the hotel and prevention of food-borne diseases represent a major challenge worldwide (Al Yousuf, Taylor, & Taylor, 2015). This constitutes the second RQ of this study.

- RQ2: What are challenges of food safety management system in hotel business?

Knowledge-Intensive Business Services (KIBS)

Based on a literature review of Knowledge Intensive Business Services (KIBS) over the last 10 years to conduct a summary of research data that focuses on Technology-

oriented KIBS (T-KIBS) and traditional professional services (P-KIBS) as shown in Table 1. Based on I. Miles (2008) the distinctive innovation patterns are displayed by KIBS based more on professional knowledge and by large network-based service firms, while many smaller service firms conform to a supplier-driven pattern. Also, KIBS can be identified as drivers of knowledge dynamics in multilevel contexts. There are many traditional segments of knowledge-intensive services, the introduction of new ICT has brought about huge structural changes. (Strambach, 2008). In addition, the effort of extending and adapting computer service companies to knowledge assets can be particularly effective, even in small businesses (Scarso & Bolisani, 2010). The T-KIBS service networks are also worth mentioning that can be acted on the base of different recourse to external knowledge and capabilities (Paiola, 2010). However, the cooperation between KIBS and universities occurs irrespective of the typology (whether professional or technological in focus). The factor bearing greatest influence over cooperation while such cooperation proves to have a positive impact on the company capacity to innovate (Fernandes & Ferreira, 2013). By comparison, other P-KIBS engagements to rely on a professional could help to establish more successful collaborations among KIBS providers, clients, and partners. (Lessard, 2014). The combination between T-KIBS and traditional professional P-KIBS are associated with the exchange of codified rather than mixed knowledge (Landry, Amara, & Doloreux, 2012). Moreover, Bettiol, Di Maria, and Grandinetti (2015) highlight, services are combined to develop specific business strategies which achieve superior performance in customization and standardization. They pair customer interaction aimed at service customization and knowledge codification useful in providing standard services, while also investing in networking.

Table 1 - P-KIBS and T-KIBS according to various authors

Also, T-KIBS generally acts as a knowledge source and P-KIBS as a knowledge bridge for small and medium manufacturing enterprises (SMMEs) (Zhou, Kautonen, Wang, & Wang, 2017)

Author	KIBS Topic	P-KIBS	T-KIBS
I. Miles (2008)	Patterns of innovation in service industries		\$
Strambach (2008)	Knowledge-Intensive Business Services (KIBS) as drivers of multilevel knowledge dynamics (Strambach, 2008)		\$

Scarso and Bolisani (2010)	Knowledge-Based Strategies for Knowledge Intensive Business Services: a Multiple Case-study of Computer Service Companies		\$
Paiola (2010)	Learning in service relations: The case of technological KIBS		\$
Landry et al. (2012)	Knowledge-exchange strategies between KIBS firms and their clients	\$	\$
Fernandes and Ferreira (2013)	Knowledge spillovers: cooperation between universities and KIBS	\$	\$
Lessard (2014)	Designing and Managing Value Co-Creation in KIBS Engagements	\$	
Bettiol et al. (2015)	Service customisation and standardisation in combinatory knowledge-intensive business services	\$	\$
Zhang et al. (2014)	How to interact with knowledge-intensive business services: A multiple case study of small and medium manufacturing enterprises in China		\$
Rodríguez, Doloreux, and Shearmur (2017)	Variety in external knowledge sourcing and innovation novelty: Evidence from the KIBS sector in Spain	\$	\$
Rodríguez, Nieto, and Santamaría (2018)	International collaboration and innovation in professional and technological knowledge-intensive services	\$	\$

Furthermore, a negative relationship was found between the variety of research sources used and the introduction of innovations new to the firm. T-KIBS' innovativeness is more strongly associated with variety of information sourcing (except general sources) and cooperation, and P-KIBS' innovativeness relates specifically to variety of general information sources (Rodríguez et al., 2017). In additional, there is more important for professional knowledge-intensive services, while diversity in international collaboration is more important for technological knowledge-intensive services (Rodríguez et al., 2018). It is thereupon reasonable to speculate that T-KIBS and P-KIBS are a potent on Food Safety Management System, RQ3 and RQ4

- RQ3: How is T-KIBS important in the food safety management knowledge in hotels?
- RQ4: How is P-KIBS important in the food safety management knowledge in hotels?

Methods

Hotel & Company selection

The context of the study is components of KIBS model, in deductive reasoning which we hold a theory and based on T-KIBS, P-KIBS and Food Safety Management System. There are three main components of reasoning that can be implemented in a hotel organization. Therefore, a qualitative research by using in-depth interview. Eighteen of luxury and upscale hotels and 2 knowledgeable service provider companies in Thailand were interviewed. As indicated in Figure 1. The interviewee from each hotel & company were experienced in FSMS project at least 2 years.



Figure 1 – Hotel FSMS Implementation and Knowledgeable service provider (KIBS)

Interviews

This study was conducted using a qualitative approach as it aimed to explore issues and the interviews followed a semi-structured protocol (Mason, 2017). Each interview with food safety team leader in hotel and the consultant from KIBS lasted around 60 minutes. During the interview, A total of 11 questions grouped into 3 subtopics were used with interviewees in Table 2.

Table 2 – Questions for interview

Subtopics	Questions	RQ 1	RQ 2	RQ 3	RQ 4
Implementing Food Safety Standard in the hotel.	Please introduce yourself and working experience regarding FSMS in the hotel.	§			
	Please describe the food safety system program in the hotel.	§	§		
	How is currently status of the food safety standard program?	§	§		
	What is the key of success on the system?		§	§	§

Food Safety Team & Leader	Do you have any food safety committee team or consultant?	§	§		
	Can Food Safety Leader assign task teams to work on specific processes?			§	§
The knowledge intensive business services (KIBS)	What kind of the tools or technology using with the food safety program?			§	
	Does hotel need innovative food safety? Why?			§	§
	Why did hotel decide to use the consultant service?				§
	Please divide the FSMS into several stages with important milestones.	§	§	§	§
	How were hotel employees willing to learn new things from the consultant service?			§	§

All questions allowed them to express their opinions freely, we carefully listened to the answer without interrupting before moving into the next question. In this process, which reflected research questions in the literature and we were able balance the convergence of the dialogue as well as the initiative of the interviewees.

Findings

Luxury and Upscale Hotels

All 18 hotels are internationally well-known brands, which are classified in Luxury and Upscale type in Thailand. Background of interviewees are: 10 of food science background, 4 of hospitality background and 4 of non-food science/hospitality related background. The followings are the questions provided for the interviewees and the summary of responses from interviewees:

...The food safety system program has been implemented to control the “Flow of Food” or the process of receiving, storing, preparing, cooking which is including cooling and reheating, holding, and serving. These are the major processes that the food goes through in the hotel...

...There are 7 hotels which have implemented the FSMS brand standard audit, 11 hotels have already reached HACCP standard, whilst the other 3 hotels have already implemented ISO 22000. All interviewees mentioned the challenging factors “a limitation of time & budget, lack of management oversight, information technology, language & culture, literacy and education, and inadequate food safety training program”.

...There are three main factors that drive a successful HACCP or ISO22000 implementation:

- 1) A seamless collaboration between management of each department: starting from procurement procedure to food handling process
- 2) All training activities within the hotel
- 3) Trustworthy food safety consultation company involvement: well-trained and longer work experience.

Based on the interviews, it is found that there is an FSMS working team set up (as described in Table 1) to implement the FSMS and certification process of the HACCP or ISO22000 standard, (as in Figure 1) by having a consultant or a professional company for coaching & developing documentation. Representatives, holding a position of Department Head are involved in the food flow process. Their role & responsibility are to comply with the policies from the food safety team leaders, by providing guideline to staff under their control. However, the most struggling challenge is the communication between supervisors and staff, which has been found common in every hotel.

According to the interview, a hotel that has an annual FSMS Brand Standard Audit, directed from the corporate office, either HACCP or ISO22000 system certification, is using an international LMS e-learning technology for all staff levels. The food safety training modules have been assigned to an individual according to their position, roles and responsibilities. However, language barrier, education levels, complexity of technology and learning styles preferences of employees may prevent them from being a successful learner or achieving food safety management. In addition, all interviewees are in need of an innovative food safety learning system to improve knowledge for supervisors and employees for better understanding of their roles and responsibilities effectively.

...Along with their corporate direction of FSMS, a hotel with an assistance of consultant service company brings expertise to its/their food safety team. This greatly helps for a quick implementation of system and certification within the timeframe set by the hotel...

The interviewees have described the process of the FSMS implementation stage as follow:

- (1) Gap Assessment was conducted by the consultant company.
- (2) The Gap report had evaluated corrective action and timeline.

- (3) The FSMS Policies were announced for implementing in the hotel.
- (4) Training all hotel employees especially who are related in the flow of food.
- (5) The internal weekly/monthly audit was conducting by hygiene manager/food safety team leader of the hotel.
- (6) Corrections to be made, tracking records for future monitoring, and monthly or quarterly FSMS team meeting to cross check.
- (7) Annual audit was conducted by corporate representative or hotel signed contractor.

The interviewees have mentioned the differences of before and after using the service of professional consultant company that there is a significant difference of the result to be seen. The professional consultant company can greatly persuade and point out the significant importance of Food Safety to all employees and management, and also follow the timeline to be certified as required by the hotel. However, there are still some limitations that the hotel may not use the service of the professional consultant, which are the limited budget and the length of the consultancy period. Some consultancy period that has been required by the hotel and clearly stated in the agreement between the hotel and the consultant might not be enough to implement the system due to the lack of communication, less food safety practice and poor food safety knowledge that should be passed on to the employees who would become the FSMS team leaders and the head of each departments.

Knowledgeable service provider companies (KIBS)

The two interviewees are the representative of the consultant service companies who have graduated master's degrees in food science with working experience in the food industry for more than 10 years as well as being a consultant for a group of hotels in Thailand and abroad. The key to success in food safety consultancy business is the suitable working collaboration with customers, which working process must be executed within the timeline as planned according to the objective requirement of the hotel. Therefore, the current status of the food safety consulting program must be accepted and adjustable to fit the requirement.

In the implementation process, 2 companies mentioned that they were using the same Information and

Communication Technology (ICT) such as Google drive, Line and Facebooks for exchanging knowledge and communicating to the hotels to deliver a consulting service.

The two interviewees had mentioned about there is a need for Food Safety Innovation to be used in the hotels to help managing an effective food safety program that relating to training and learning system. This will help all hotel employees to be able to reach to the information and be able to have a more understanding of their roles and responsibilities.

The two consulting companies believe that their customers decided to use their consultant services because of their expertise in the consultation and their experiences to deliver both timely and accurate project outcomes, which based on the following FSMS milestones;

Stage1-Risk and Gap Analysis on Facility, Process and Documentation

Stage2-Comprehensive Food Safety Training

Stage3-Documentation of the Pre-requisite Programs

Stage4-Development of Manual (FSMS, HACCP or ISO22000)

Stage5-System Implementation

Stage6-Consultative Food Safety Audit & Review

... The importance keys to get all employees to accept and be interested in learning and working with the consultant team are an effective & accurate working process that can communicate quickly, simple knowledge providing process that is not too difficult to understand, and certainly not interrupting their work...

Discussions

Implementing Food Safety Standard in the hotel.

The interviews revealed that 12 luxury & 6 upscale hotels were implemented food safety management system brand standard. In addition, some hotels have been implemented a FSMS based on HACCP or ISO22000 certification system. However, the context of food safety system in hotels were described the same implementation process to control the "Flow of Food". Moreover, lack of management oversight, information technology, language & culture, literacy and education, and inadequate food safety training program" are importantly barriers. Based

on Mercan and Bucak (2013) have suggested that seeking support from the professional consulting firms or P-KIBS when they need about problems. There was challenging to find an individual who had technical knowledge of Food Safety System or HACCP because of hiring budget reason (Wilcock et al., 2011), it stands to reason for hotel cannot use the professional consultant company in the implementation process.

Food Safety Team & Leader

The interviewees described that hotel have the food safety committee team, but there is a challenge of internal-communication from food safety team leader and head of departments to all employees in hotel for understanding their role & responsibilities correctly. Therefore, understanding the mechanisms that translate knowledge into practice can help in developing new strategies for ensuring food safety implementation (Rossi et al., 2017). However, department manager also think that the high turnover of staff constitutes a great barrier to HACCP efficiency (Casolani & Del Signore, 2016).

The knowledge intensive business services (KIBS)

The interviews revealed connection between hotels and KIBS which are requiring hotel management collaboration, effectively food safety training program, expertise food safety consultant and technology for internal-external communication on food safety standard. Moreover, 2 interviewees from KIBS company described to the successful FSMS depends on qualified FSMS team in hotel and collaborative relationships with the consultant in order to exchange knowledge and develop consistence of food safety system. In addition Paiola (2010) have found that The T-KIBS service networks are also worth mentioning that can be acted on the base of different recourse to external knowledge and capabilities. All interviewees want an innovative food safety learning system as a knowledge source of FSMS program.

The Components of Knowledge Intensive Business Services (KIBS) model

Based on findings, Therefore, our proposed conceptual framework for KIBS model to become effective FSMS in Hotel by three components: 1) Management System & Implementation process2) Traditional professional services (P-KIBS) 3) Traditional professional services (P-KIBS) in Figure 2.

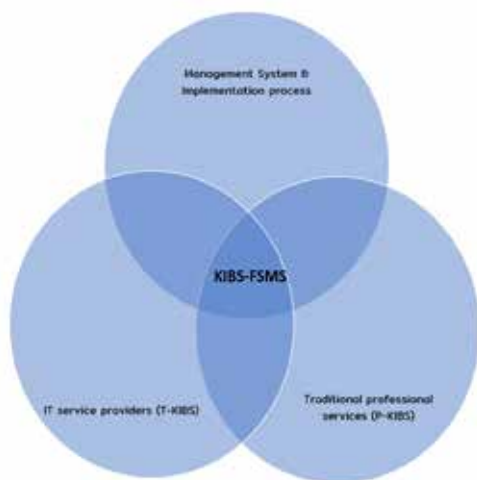


Figure 2 The Components of Knowledge Intensive Business Services (KIBS) model for Food Safety Management System (FSMS) in the hotel

Conclusion

Food safety consulting services are source of Intensive-knowledge as a provider in specific recommendation for controlling the common risk factors for foodborne illness in the hotel that need to be ensure the food safety system is established, implemented and maintained and comply with the relevant standards and regulations. The results of this study highlight a successful of FSMS implementation program in hotel is consisting of three elements; firstly, a seamless collaboration between management of each department, starting from procurement procedure to food handling process. Secondly, the more food safety training and communication technologies, the more likely full which are providing in hotel. Thirdly, trustworthy communication technology and professional consultant involvement. In addition, the food safety team leader and knowledgeable service provider companies are importantly driving FSMS program in hotel. These are resulted from in-depth interviews have been clustered in relationship to the three components are management system and implementation process, T-KIBS and P-KIBS, all of which constitute an integrated FSMS model for KIBS.

Theoretically, knowledge and attitudes, time limitation, staff turnover, costs and lack of management commitment are barriers to implement FSMS in the Thailand Hotel Tourism industry. Based on the result, this study has provided 3 components of KIBS-FSMS model for implementing. Moreover, there is a value proposition to

the hotel that addressed a sweet-spot KIBS-FSMS model would be more accomplished where adding a new channel of simultaneously provides additional value to existing FSMS implementation plan for future business model innovation of knowledge service business.

Research Limitations

There are some limitations in this study that should be highlighted. Hence, for the further research is needed more details and number of hotels to confirm the findings of the FSMS-KIBS model that can influence the new business model.

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Jatayu Restaurant of Nepal and Its Impact on Tourism

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Abstract

The purpose of this study is to focusing on vulture conservation, Vulture population status of critically endangered vulture. Jatayu Restaurant not for the dinner but an environment for beauty of nature, for the home of those species which are on the verge of endangered, for the shelter of vulture, a tertiary consumer. The concept of conservation of those endangered species are interlink directly to the human life, life of those species and the resources dependent on those species. Being a part of the eco-system the rational human society has the foremost role to sustain and balance the eco system. Vulture, being a part of eco system has a right to live and its our essence to sustain those species for our future. The cycle of effect on human population and human concern to vulture has major impact on human vulture relationship. Vulture human relationship is not a well-defined term. But it is an established concern to visualize. Humans are the savior of the eco system. The human society has role to maintain the feeding, habitat and concern to vulture's population.

Keywords

Jatayu, White Rumped, Monitoring, Diclofenac, Community, Awareness, Vulture, Conservation Tourism, Technology, Modern, Traditional, Scavenger, Restaurant

Introduction

Nepal is a landlocked country possessing diverse scenario of natural piety. Flora and Fauna fascinates the tourists and enriches our glory and identity in the world. Identity of diverse bio-composition and prosperity of natural grandeur of our country derives any viewer to the path of nostalgic attachment to natural heritage. The spot, Jatayu Restaurant is well facilitated with road transportation facility. East- West highway passes through the nearby area of the spot. The spot is near the rich natural heritage of Chitwan national park and piety of Narayani River with its religious importance Resort and eco-tourism is the boon for the spot and nearby areas of the spot in the district. Tourism is a smokeless industry. For the betterment of good economic development, tourism is highly supportive for the country like Nepal as our country is very rich in natural and cultural heritage.

Internal and external tourist can visit the different place to raise tourism industry. Everyone can get high satisfaction through outstanding practice of natural conservation on Vulture via destined spot.

Pithauli a village in Nawalpur district in southern Nepal, is being frequently visited by a large number of tourists.

This attraction of Jatayu Restaurant not a dinner but a feeding Centre for Vultures. The Restaurant is established in Namuna community forest to preserve endangered species of Vulture specially the White Rumped and Slender billed Vulture. As Nawalpur (Pithauli Jatayu Restaurant) contains seven of the nine species of Vulture in the world setting up the Restaurant has made it easier for conservation to monitor the birds and their activities.

Statement of the problem

Vulture being endangered species and tertiary consumer of food chain has direct impact on ecosystem. Without maintaining ecosystem sustainable development of World and future generation is impossible. Human life is highly dependent on natural resources for their existence. Vulture being tertiary consumer in food chain and part of food web links to all the ecosystem behavior. The study of research on Vulture seems to be reliable to present context as Vulture species are being endangered species to the country.

Research Questions

1. How the conservation practice has been practiced in the study area?

2. How the people are benefited from this programme?
3. What are effect in promotion of tourism due to practice?
4. What is condition of Vulture in the defined area?

Objectives of the study

- To introduce conservation practice on vulture and to study participation of Local people to the practice at Jatayu Restaurant
- To view out the scope of tourism industry through the practice and to analyze benefit to local people.
- To measure efficiency along with extracting out inaccuracy in the management system of Jatayu Restaurant.

Review

The literature review is one of the most important parts of research. It helps a researcher become familiarized with the existing theories, concepts and ideas pertinent to the subject matter, which might also be helpful to a researcher to develop new theories, concept and ideas. The literature view dose not intent mere to collect information on the subject matters under study. Review of different forms of literature was done for the following objectives.

1. To collect background knowledge on the research topic
2. To apply appropriate methods of research design.
3. To construct a theoretical frame work.
4. To know how other researchers analysed the issues and structured and compiled the reports.
5. To identify data sources used by other researcher.

In this light the researcher has collected many books, reports journals, newspaper cutting and data from various sources, and consulted with due consideration so that the issues and ideas of study could be effectively presented they are listed in the bibliography as listed in the report. [4]

Literature on bio-diversity and conservation of wildlife.

Bennett, on “ecosystem, Resources conservation and Anthropological Research” has described human ecology as human behaviour and had presented essays in environment and development .F.Berkes and M.T. fervour on “introduction and overview” has discussed

on common property resources and has mentioned about ecology and community based sustainable development has written about forest from culture, environment and development .

Ghimire. and Pimbert on their book “Social change and conservation “ had highlighted on environmental politics and compacts of national parks and protected areas F. Berkesi on his book “Co-operation Development “ has discussed on relation between conservation and cultural values. B.S. Brush have presented information on Anthropology and the conservation of bio-diversity of their “Annual Review of Anthropology.”[9, 16, 19, 20]

Literature on Vulture Conservation Practice

Many species threatened by loss of habitat have been surveyed. This includes the cape vulture and Teita falcon in South Africa and African fish eagle. These researches are presented by the peregrine fund Organization (May 2009) Indian vultures, a vulnerable species and Diclofenac residues as the cause of vulture population decline in Pakistan in July 2009 (Pamela C. Rasmussen)

Canarjan Egyptian vulture generally nest on clefts and caves are made the subjects of researches by life Projects in Spain (Dec. 2008) and by Gangoso Laura (2005). Texas State forensic Research on May 2006 researched on vulture. It can grow to be 32 inches long. Unlike other vulture, it is dark in colour. Research of king vulture Diane Jukofsy (2002).

Literature Review on vulture conservation in Nepal.

The review of literature on Population status of critically endangered vulture and breeding success of two species of vulture white ramped vulture and community management Pithauli Jatayu Restaurant which was first vulture Restaurant in the world decline of vulture basically discussed on dramatic wild life story which receive little public attention is the decline in vulture population globally.

The statics are quite startling, the impact enormous. It is not only the wildlife ecosystem that suffers from this decline but also human health in Nepal the population decline has also been recorded at over 90%. The worst killer of vulture has been the poisoning of animal carcasses both intentionally and unintentionally. The main cause of vulture decline is the using of Diclofenac in treating cattle which cause kidney failure. (IUCN 2010).

Vulture is one of the endangered species. It's rare care and conservation is highly essential to preserve biodiversity. Being one of the major parts of ecosystem its conservation is needed to prevent its extinction. Vulture conservation has two way benefits one for the protection of ecosystem and other for the promotion of tourism. This kind of practice is highly relevant in the present context. To prevent the extinction of those species and to publicize the conservation method of practice, the proposed research can impart a great support. Conservation is focus on concern for various organizations. Many local, national and international level organization are involved in conservation practice on various endangered species. Many organization are running projects campaigns, programme and seminars to deliver required information on endangered species. Government agencies, local organization NGOs and INGOs, Governmental ministry, WWF, IUCN are BCN involved to protect endangered species in Nepal.

Tourism

Tourism industry is mainly based on bio-diversity. Tourist visit those places which is of new kind and is outstanding in natural diversity piety local people can be facilitated by economic growth on the base of flourishing tourism industry. Tourism industry can be made a source of flourishing tourism industry. Tourism industry can be made a source of income and employment Restaurant as a feeding center for Vulture is only one kind in Asia. It has separate identity and glory. The curiosity on Vulture can be solved by conservational practice at Jatayu Restaurant.

Research Method

This section has discussed a set of methods to be explored to accomplish the research objectives, more specifically, it contains nature of data collection tools, data analysis and interpretation. During the study descriptive cum exploratory design was applied. Primary as well as secondary data's are widely presented in the thesis. Field survey as well as related information were adequately used for collecting data and describing theories. Dividing different groups different groups were interviewed to collect data for information stratified sampling method was undertaken in the study. Using anthropological field work method, data were collected through interview, observation and question technique. The secondary data was collected from various brochures and reports related to Vulture conservation programme. Both qualitative and quantitative data was collected.

Major Findings

Jatayu Restaurant contribution to maintain Vulture habitat through provision of safe food was identified. Local view and inadequate factors to flourish restaurant was oozed out. Income generation of the local people through restaurant effort was studied. Local people supported to continue community based management system. Local effort and participation was found satisfactory for Jatayu Restaurant conduction female involvement was analyzed. Eco-tourism for local people's income generation was understood and successful campaign of Vulture conservation practice was research.

Discussion

Jatayu Restaurant has implicated its success on conservation during the twelve years of practice. Tourism a part of country's the progressive increment in the Vulture population on different area of country has broaden of concept to preserve the endanger species and extinct species. Management of the carcasses reduces pollution and provides advantage to promote habitat for vulture feeding. These Restaurant provides Diclofenac free carcasses which has major contribution to vulture contribution to vulture contribution to vulture feeding as these drug was found to be major cause of decline in Vulture population before. The main aim of this project is to provide safe food for critically endangered vulture is stewarding and management of the local communities. Cattle, when become old and unproductive they are collected at cow rescue centre of Jatayu Restaurant but paying to farmers. Those old cow are provided good care and facility. After natural death, these carcasses are kept at designed place where Vulture comes to feed on. Tourist can enjoy more varieties of vultures, Vultures swoop down at meal time and other birds of prey in vicinity.

The Jatayu Restaurant can promote the social wellbeing, educational essence and employment benefits the local population with good source of income vegetated via tourism. Jatayu Restaurant provides information in comers about these creatures and its conservation effort carried out to safeguard them natural history, other birds and mammals information are additional aspects. Research on population of Vulture Colonies and breeding success and Jatayu (Vulture) Restaurant of Nepal and its impact on Tourism in Nepal being carried out awareness raising activities to different groups and facilities has been promoted by the project.

Conclusion and Recommendation

Being a community based project, it has promoted the indigenous Tharu community to promote their identity to generate there in come and to preserve their culture. Culture promotion has been supported by this project Tharu Culture and their varieties of food can be enjoyed near by the project. Tharu culture and there varieties of food can be enjoyed near by the project. The project is a community based so, participation and collaboration of the community people has benefited the concept of group work and participation of community people to outcome a common purposes Jatayu Restaurant being a home to nature has community participation and group work. Social bonding and cultural identity with ethnic promotion has been additional outcomes of these projects.

Every good concept has challenges also. Continuation of the project has Jatayau Restaurant, a complete home to nature, managerial set up have imparted the glory to attract the tourist. This Restaurant has been advantages for the income generation.

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Examining the Effects of Business Intelligence and Analytics Tools on Decision Quality and Efficiency: A Preliminary Empirical Study

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Abstract

Business Intelligence (BI) systems are used to help individuals making better decisions by processing a large amount of data into useful information. The adoption of BI helps strategically improve business in many areas. Recently, BI studies have gained increasing importance. IS researchers enquired more on what constitutes usage of this system. This study attempts to explore the effects of BI systems on decision quality and efficiency. Previous research on decision-making and BI systems were reviewed and conceptualized to form a proposed research framework. The proposed theoretical model is tested against empirical data collected from BI users in Thailand. An online self-administered questionnaire was posted to Facebook pages and groups related to business intelligence. A total of 40 valid responses were collected. The results of this study will examine the effects of business intelligence and analytics tools on decision quality and efficiency.

Keywords

Data Visualization, Decision-Making, Business Intelligence

Introduction

Business Intelligence (BI) systems are used to help individuals making better decisions by processing a large amount of data into useful information [1, 2]. Data are extracted, transformed, managed, and analyzed in order to identify trends and significant business issues [3]. Many organizations employ BI to extract business insights from data. The adoption of BI helps strategically improve business in many areas; for instance, gaining better understanding customers [4], identify and prevent fraud [5], and suggesting a course of alternative actions [6]. Evidently, BI could improve business process performance which, in turns, translates into organizational performance [7].

Recently, BI studies have gained increasing importance. IS researchers enquired more on what constitutes usage of this system. Technology Acceptance Model (TAM) offers explanation on what determines system usage [8]. Ease of use and usefulness are hypothesized as two main determinants. Bach, et al. [9] investigated the adoption of BI systems in Taiwanese electronic industry firms and confirmed the determinant role of these two precursors. Although TAM offers explanation on what determines BI

system usage, it does not provide understanding of how this system helps improve individual decision-making.

BI systems continue to evolve as Chen, et al. [10] classified this evolution into three phases. The first era of evolution was a data-centric approach focusing on structured content. The second phase emphasized the needs to analyze unstructured content. And the third era geared the focus of the analysis toward mobile and sensor-based content. The expanding scope of capabilities, research in this area seemed to be in the exploratory stage evidenced by the high proportion of the studies adopted theory formulation and literature review strategies [11]. There is still an ample area for future research to address the fundamental issues of IS research related to BI.

This study attempts to explore the effects of BI systems on decision quality and efficiency. Previous research on decision-making and BI systems were reviewed and conceptualized to form a proposed research framework. The proposed theoretical model is tested against empirical data collected from BI users in Thailand. Consequently, the manuscript concludes with the discussion and future plans of the research.

Theoretical Background

BI systems offered various features enabling users to autonomously choose how data should be presented. Jourdan, et al. [11] have reviewed the literature related to BI topics. The number of studies in the area of decision making is relatively small compared to the topics related to implementation and strategies. This study aims to extend this area of BI research since studies in judgmental decision-making research areas have shown to provide insights into how BI capabilities influence managerial decision-making. The present research employs the view of the fit focus research [12]. This study posits that the fit between task characteristics and styles of decision makers will determine BI usage, which in turn, impact individual decision quality. The proposed research framework of this study is depicted in Figure 1.

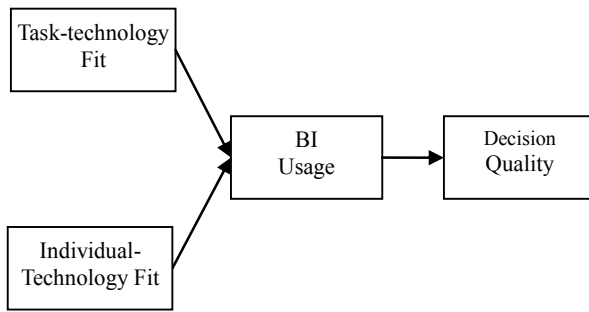


Figure 1 – Proposed Research Framework

Decision Quality and Efficiency

Decision quality is one of the key constructs representing performance influenced by IS usage and was referred as the accuracy of decisions [13]. Previous empirical studies on BI investigated the effects of BI usage on decision quality and efficiency. Wieder, et al. [14] formulated BI quality and performance model. BI usage was hypothesized to impact positively on decision quality. Empirical test of this model revealed that the relationship between BI use and decision quality was not significantly related. Only data quality was found to positively impact on decision quality. Visinescu, et al. [15] also conducted a study to investigate key antecedents of decision quality made using BI system support. BI use was also hypothesized to positively impact decision quality. It was found that BI use had a negative direct effect on decision quality. This is because of the interaction effect of information quality and BI use on decision quality. BI use will have a positive direct effect on decision quality when the information quality is high.

The main objective of BI systems is to support individual in making decisions. Using BI is believed to have a positive effect on individual performance specifically, decision quality. Hence, the following statement is hypothesized:

H1: BI usage has a positive effect on decision quality.

Task-Technology Fit Model

Technology can be seen as a key enabler to enhance individual performance on performing a particular task. IS researchers have provided evidences on how technology help impact individual performance. Task-technology fit (TTF) model is one of these many research streams. This model posits that the performance impact is a result of the fit between technology features, individual abilities, and task requirements [12]. In contrast, Technology Acceptance Model (TAM) argues that users will use a system when they perceive it to be easy to user and useful. Whereas, TTF views that users will choose to use a system that enable them to complete a task with highest performance impact [16].

BI system has been acknowledged to improve individual impact on decision-making. Features of this particular system support users in processing a large amount of data to extract insights. Hence, this study proposes the following hypothesis:

H2: Task-technology fit has a positive effect on BI Usage
Individual-Technology Fit: Decision-maker styles

Individual-technology fit is another aspect of TTF [17]. It refers to the degree of correspondence between individual abilities and functionality of technology. Individuals with capabilities matched with BI system will lead to higher performance impact. Since the objective of BI system is to support decision-making, this research attempts to examine decision-making styles that correspond with the system functionality.

Decision makers were believed to be one of important factors influencing decision quality [13]. Scott and Bruce [18] developed the General Decision-Making Style Inventory which is one of the most widely used measures for decision-making styles [19]. There are five unique styles. Rational decision makers search information thoroughly and evaluate alternatives logically. Intuitive decision makers rely mostly on hunches and feelings. Dependent decision makers seek advices and directions from others. Avoidant decision makers tend to avoid making decisions. Lastly, spontaneous decision makers

make prompt and speedy decisions. Among these five styles, it appears that only rational decision makers will gain benefits from using BI systems. Thus, the following hypotheses are proposed:

H3: Rational decision style is positively associated with BI usage.

H4: Intuitive decision style is not associated with BI usage.

H5: Dependent decision style is not associated with BI usage.

H6: Avoidant decision style is not associated with BI usage.

H7: Spontaneous decision style is not associated with BI usage.

Research Method

An online self-administered questionnaire was posted to Facebook pages and groups related to business intelligence. A total of 40 valid responses were collected.

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Integrating AI with Black-Litterman Model for Robo-Advisor: An Enhancement Using Deep Learning-Based Views

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Abstract

This research aims to develop the system for Robo-Advisor in portfolio optimization by integrating deep learning-based market views with Black-Litterman model. The idea of Black-Litterman model has been widely accepted and adopted in asset allocation techniques, by providing investors a solution to blend their views about the market into their portfolio. The literature on the topic of portfolio optimization has been offering plenty of theoretical and practical guidance for implementing the theory; however, there is a paucity of studies focusing on the applications which are designed for AI Robo-Advisor. In this research, we proposed an AI modular system and focused on integrating deep learning method and the Black-Litterman model to generate optimal asset allocation weights. We used Long Short-Term Memory (LSTM) with attention mechanism to generate deep learning-based market views for enhancement. The system we developed is expandable and can be used as a sub-system for AI Robo-Advisor to provide optimal portfolio in automated investment management.

Keywords

Artificial Intelligent (AI), Black-Litterman Model, Deep Learning, Robo-Advisors, Portfolio Optimization.

1. Introduction

As an innovation in the investment management sector, Robo-Advisors provides automated investment management services to investors by using algorithms and acting as like human advisors to support investors making investment decisions. During the investment planning stage, portfolio optimization plays a crucial role, especially for the medium and long-term investors, in determining the allocation weight of assets to achieve the balance between investors expected return and risk

tolerance.

The literature on the topic of algorithmic trading and portfolio optimization has been offering plenty of theoretical and practical guidance for implementation; however, there is a paucity of studies focusing on the applications which are designed for Robo-Advisors. To fill this research gap, this research aims to develop the system framework for AI Robo-Advisor which provides portfolio optimization to support investors during the process of making investment decisions.

We used a deep learning approach, Long Short-Term Memory (LSTM) with attention mechanism, to develop our algorithm to solve the complexity of sequence dependence in time-series forecasting. And based on the algorithm, we further developed an automated system to perform time-series forecasting and used the result to perform portfolio optimization to show that LSTM based algorithm added value. We proposed a AI modular system and focused on integrating deep learning method and the Black-Litterman model to generate asset allocation weight. The system we built is expandable and can be used as a framework when developing AI Robo-Advisors in automated investment management.

2. Literature Reviews

2.1 Robo-Advisors

Robo-Advisors are a digital platform which provides investment advisory and financial services for investors by using algorithms with the characteristics of low costs, availability, and ease-of-use. Traditional wealth management is both expensive and exclusive. Automated investment management in the form of Robo-Advisors seeks to change this and brings wealth management to an affordable price (Rättyä, 2016). Robo-Advisors are driven by big data (Sironi, 2016). By applying big data and artificial intelligence, it has changed the way of providing wealth management services and forcing traditional advisory to evolve new business model (Chishti & Barberis, 2016; Fein, 2015).

Robo-Advisors make dynamic adjustments and asset allocation to form an optimal portfolio base on the given conditions and financial market status. By collecting customers' data and conducting customer segment, Robo-Advisors allocate funds into assets and re-balance the portfolio based on algorithms, and preparing a report for investors to review their investment performance. The algorithm used by Robo-Advisors is based on data science and statistical model, following the changing financial market condition, which seeking an optimal portfolio to fit the client's preference and expectation.

2.2 The Black-Litterman Model

Most of the Robo-Advisors are based on Modern Portfolio Theory to implement portfolio optimization. The Black-Litterman model (Black & Litterman, 1992) was developed by Fischer Black and Robert Litterman in 1992

at Goldman Sachs. This model has been widely accepted by the Wall Street firms for asset allocation. It solved the issue of input sensitive when using the Markowitz Mean-Variance model (Markowitz, 1952). The Black-Litterman model allows the investors to combine their views on certain assets with the market equilibrium returns to formulate the posterior expected return. The views could be obtained from individual expertise, which is rather subjective, or could be generated from a subjective perspective by adopting quantitative model or machine learning method.

2.3 Deep Learning and Long Short-Term Memories

Deep learning is a branch of machine learning method in artificial intelligence research field. Composing of multiple processing layers, deep learning allows computational models to extract higher levels of abstraction. In recent years, deep artificial neural networks have proved itself by its success in pattern recognition, speech recognition, and natural language processing (LeCun, Bengio, & Hinton, 2015). Aside from the application of picture recognition, the sequence to sequence translation is also a trending topic. Most of the former are done with convolutional neural networks, and most of the latter is done with recurrent neural networks, particularly Long Short-Term Memory (LSTM).

LSTM, a type of recurrent neural network used in deep learning, has the unique structure enables the model to make a prediction with earlier memories. It has gates to help it decides which information to remember, ignore, forget and select when new information flows in. LSTM can be not only applying on the sequence to sequence translation but also on financial prediction problems, such as pricing securities, constructing portfolio and risk management (Gamboa, 2017). Financial prediction problems involve large data sets with complex data interactions that are difficult to specify in standard methods in finance. It may detect these interactions in the data and produce a useful result. Literature also stated that time-series problem could be solved by deep learning approach and unsupervised feature learning (Långkvist, Karlsson, & Loutfi, 2014). Time series prediction problems are a difficult because of the complexity of sequence dependence among the input variables added by time series. LSTM can handle these sorts of sequence dependences because large architectures can be successfully trained. In addition, it has several

advantages, such as expands and includes all possible relevance items to the input data, captures non-linearities and complex interactions among input data more easily to avoid over-fitting and increase in-sample fit versus traditional models.

3. Methodology

In this research, the System Development Research Methodology (Nunamaker, Chen, & Purdin, 1990) in information systems research was implemented as our method.

3.1 Research Design

The development has divided into five stages for our robo-advisor system which is shown as follows:

3.1.1 Construct a Conceptual Framework

Describe and analyze the research problems for building a robo-advisor. Next, we investigate system requirement and functions; understand the system process and procedure, and survey system criteria and methods.

3.1.2 Develop System Architecture

Develop modular and expandable system architecture. Define the core functions of the system and describe the relationship between each function.

3.1.3 Analyze & Design the System

Design and implement the database and knowledge base for the robo-advisor system and evaluate the potential solutions.

3.1.4 Build the System

Build the robo-advisor system and explore the solutions by progressively understanding the difficulties and complexity while implementing the system.

3.1.5 Observe & Evaluate the System

Observe and evaluate the performance of the robo-advisor system. Improve the system based on the experiences learned from the result of experiments.

3.2 System Architecture

To perform the task of building a customized optimal portfolio, the system is composing by several modules written in Python language (shown in Figure 1).

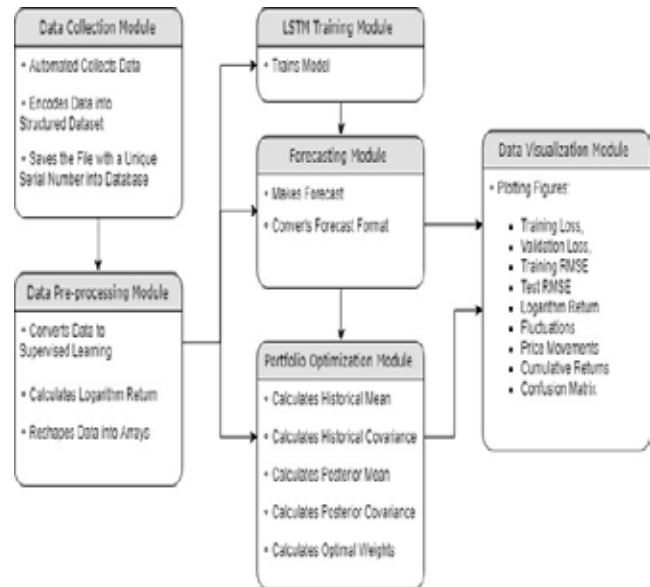


Figure 1 System Architecture

The modules in our proposed system architecture include:

3.2.1 Data Collection Module

It executes automated data collecting, extracting the daily adjusted closing price, encoding the data into a structured dataset, and saving the file with a unique serial number into a database for future access and retrieval.

3.2.2 Data Preprocessing Module

It converts and transforms the time series data into a dataset for supervised learning. It calculates the logarithm return at each time point, and reshape the data into arrays that can be processed in the LSTM module. Each array contains a specified number of lag periods, the past n-days returns of adjusted closing prices, as input variables; and a specified number of predict period, the next n-days returns of adjusted closing prices, as the target variable.

3.2.3 LSTM Training Module

It performs the function of training the model to capture the long-term tendencies and pattern for making forecasts. It processes the input data and compares its forecasts with the given true values. It will pass the weight to next epoch after each training epochs. It returns the training history and trained model as outputs.

3.2.4 Forecasting Module

This module is specially designed to make forecasting with a batch size of 1 to manually solve the error occurring when using the Stateful LSTM. This module uses the model trained by LSTM module to make a forecast and converts the forecast

values into the formats that can be used in the various form of applications.

3.2.5 Data Visualization Module

It visualizes the data, including records of training loss, validation loss, training RMSE (root mean square errors) and test RMSE, plots figures of logarithm return fluctuations and price movements, cumulative returns, and confusion matrix for portfolios and ETF components.

3.2.6 Portfolio Optimization Module

In this module, we perform the portfolio optimization. It generates investor views about assets by using the result obtained from LSTM forecasting module. It calculates the historical mean and covariance, the posterior mean and covariance, and optimal portfolio weights.

3.3 Subjects and Data Collection

The daily adjusted closing price of ETFs (Exchange Traded Funds) is chosen as our input and target variable. ETF is marketable security that tracks an index, bonds, commodities, or a basket of assets. The benefit of trading ETFs is that it has higher liquidity and lower trading

fees comparing with standard mutual funds. Our data collecting period is over 10 years long from 2008-09-30 to 2019-03-31, totally 2739 trading days. The other inputs includes major market indices, macroeconomic indicators, financial environment indicators, exchange rates

3.4 Time-Series to Supervised Learning

The time series data requires transformation into arrays to perform supervised learning. First, a logarithm return of each day will be calculated, by doing this, the time series data will be following log-normal distribution and making the result of our model more robust. Next, we used a moving window of past 120 trading days for each time point we trying to predict.

3.5 LSTM Model Configuration

We used Stateful LSTM with attention mechanism to train our model. Under this setting, the order of data is now relevant for Stateful LSTM, so the data should not be shuffled while training the model. Table 1 presents the model configurations. We chose tanh activation function, mean square error as loss function and Adam as the optimizer. The epoch of 30 is chosen for the reason of time efficiency. Table 2 shows the model summary.

Table 1 Model Configurations

Config	Input	Output	Epochs	Batch Size	Neurons
20D Model	2729	1	30	512	200

Table 2 Model Summary

1D Model		
Layers (type)	Output Shape	Param #
lstm_1 (LSTM)	(None, 200)	219200
repeat_vector_1 (RepeatVector)	(None, 1, 200)	0
AttentionDecoder (AttentionDense)	(None, 1, 73)	439402
lstm_2 (LSTM)	(None, 1, 200)	219200
time_distributed_1 (TimeDistributed)	(None, 1, 100)	20100
dense_2 (Dense)	(None, 1, 1)	101
Total params: 898,003		
Trainable params: 898,003		
Non-trainable params: 0		

3.6 The Black-Litterman Model

We used the Black-Litterman model and Markowitz Mean-Variance Optimization to perform the portfolio optimization. The formula (Idzorek, 2002; Meucci, 2006; Walters, 2014) for the new Combined Return Vector ($E[R]$) is

$$E[R] = [(\tau\Sigma)^{-1} + P'\Omega^{-1}P]^{-1} [(\tau\Sigma)^{-1}\Pi + P'\Omega^{-1}Q]$$

Where

$E[R]$ is the new (posterior) Combined Return Vector ($N \times 1$ column vector);

τ is a scalar;

Σ is the covariance matrix of excess returns ($N \times N$ matrix);

P is a matrix that identifies the assets involved in the views ($K \times N$ matrix or $1 \times N$ row vector in the special case of 1 view);

Ω is a diagonal covariance matrix of error terms from the expressed views representing the uncertainty in each view ($K \times K$ matrix);

Π is the Implied Equilibrium Return Vector ($N \times 1$ column vector); and,

Q is the View Vector ($K \times 1$ column vector).

To implement the Black-Litterman Model, the process can be divided into following steps:

Step 1: Calculate historical mean and covariance.

Step 2: Use historical mean as a priori implied equilibrium return.

Step 3: Combine the investor views.

Step 4: Calculate the posterior mean and covariance.

Step 5: Calculate the portfolio weight through the mean-variance optimization using posterior mean and covariance.

4. Experimental Results And Analysis

In this section, we presented the portfolio optimization by using the deep learning-based investor views to show that our system and algorithms added value. The deep learning-based investor views converts the forecasts obtained from LSTM with attention mechanism 20D model as input cooperating with the Black-Litterman Model to achieve the goal of portfolio optimization.

4.1 Portfolio Optimization Integrating with LSTM Based Investor Views

We implemented the Black-Litterman model to perform portfolio optimization by integrating with the investor views generated by the LSTM forecasting model as an input for the Black-Litterman model. Six assets were chosen to construct our portfolio (shown in Table 3). To show the process of portfolio optimization, we considered a scenario that requires a fund manager to rebalance the portfolio weights at the beginning of each month to reach a higher cumulative return compared with the Markowitz portfolio and equal weights portfolio from January 2011 to March 2019. This requires using our LSTM forecasting model to generate the deep learning-based investor views about the performance of chosen assets in each month.

Table 3 Six Selected Assets Portfolio

Symbol	Name	Category
IVW	S&P 500 Growth ETF	U.S. Large Cap Growth Equities
IVE	S&P 500 Value ETF	U.S. Large Cap Value Equities
IWN	Russell 2000 Value ETF	U.S. Small Cap Value Equities
IWO	Russell 2000 Growth ETF	U.S. Small Cap Growth Equities
EFA	MSCI EAFE ETF	Foreign Developed Equities
EEM	MSCI Emerging Markets ETF	Emerging Markets Equities

4.1.1 Deep Learning-Based Investor Views

We first prepared the investor views by using the LSTM model to predict the quarterly returns for each quarter. We used the past 120 daily returns as inputs for training data, and the model forecasts the return for the 20 days later.

By following the previous illustration, we have obtained the predictions of returns and prices for each asset at the end of each quarter. Next, we can formulate our investor views of each quarter by using these predictions. All the investor views for each quarter will look like this:

View 1: U.S. Large Cap Growth Equities will outperform, or underperform, U.S. Large Cap Value Equities by X %.

View 2: U.S. Small Cap Growth Equities will outperform, or underperform, U.S. Small Cap Value Equities by X %.

View 3: Foreign Developed Equities will outperform, or underperform, Emerging Markets Equities by X %.

In Appendix A, it shows the views formed by the LSTM prediction. For example, in the predicted cell of column View 1 in November 3, 2011, the positive return was the difference between U.S. Large Cap Growth Equities and U.S. Large Cap Value Equities, which shows that U.S. Large Cap Growth Equities will outperform U.S. Large Cap Value Equities by 0.11 %.

4.1.2 Black-Litterman Model

Following the steps to implement the Black-Litterman model, we prepared the quarterly historical data, including historical average returns and the covariance matrix for each asset in our portfolio as the input for the Black-Litterman model. Next, we combined the investor views shown in previous section with the historical returns using the Black-Litterman formula to generate the posterior mean and posterior covariance matrix. And finally, using the same technique developed by Markowitz, we put the posterior mean and posterior covariance matrix back to the mean-variance optimization to obtain the portfolio weights. In Appendix B, it presented the Black-Litterman portfolio weights, which were generated by cooperating with the deep learning-based investor views. The Markowitz portfolio weights are obtained from mean-variance optimization by using historical returns and covariance.

4.2 Portfolio Performance from January 2011 to March 2019

In this section, we used the weights to rebalance the portfolio at the beginning of each month and presented the performance of the portfolio from January 2011 to March 2019. As a comparison, we constructed three portfolios, the Black-Litterman portfolio with the deep learning-based investor views, the Markowitz Portfolio using historical returns and covariance, and a simple equally weighted portfolio as a benchmark.

Overall, the Black-Litterman portfolio with the deep learning-based investor views has better performance comparing with the Markowitz portfolio and the equal weights portfolio. The portfolio statistics in Table 4 supporting our result, it has higher annual returns of 9.06%, about 0.23% enhancement from Markowitz portfolio. And it also reached higher Sharpe ratio, stability and lower maximum drawdown. In Figure 2, we presented the line graph of cumulative returns of the portfolios comparison from January 2011 to March 2019.

Table 4 Annual Portfolio Statistics

	Deep Learning-Based Investor Views Portfolio	Markowitz Portfolio	Equal Weight Portfolio
Annual return	9.06%	8.83%	8.37%
Cumulative returns	102.61%	99.11%	92.32%
Annual volatility	13.88%	13.77%	15.99%
Sharpe ratio	0.695	0.684	0.583
Calmar ratio	0.391	0.365	0.331
Stability	0.937	0.934	0.919
Max drawdown	-23.18%	-24.18%	-25.29%
Omega ratio	1.137	1.135	1.112
Sortino ratio	0.960	0.944	0.805
Tail ratio	0.934	0.928	0.928
Daily value at risk	-1.71%	-1.70%	-1.98%
Alpha	0.019	0.017	
Beta	0.834	0.827	
Information ratio	0.0044	0.0013	



Figure 2 Portfolio Cumulative Returns

In Figure 3, we can also observed that returns performance of deep learning-based views portfolios and Markowitz Portfolio have very similar results, but deep learning-based views portfolios have the shorter drawdown periods (shown in Figure 4) and lowest maximum drawdowns (shown in Figure 5).

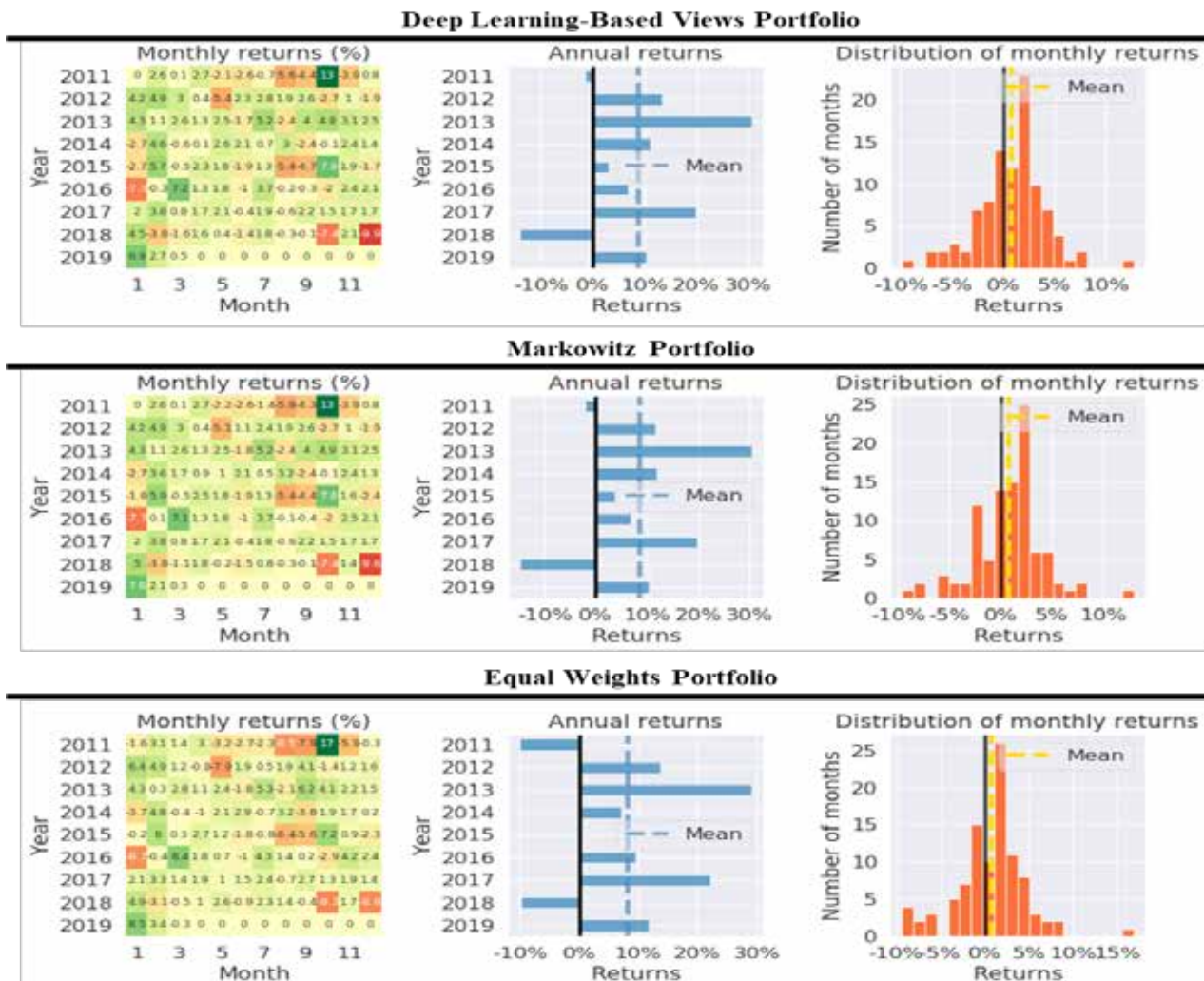
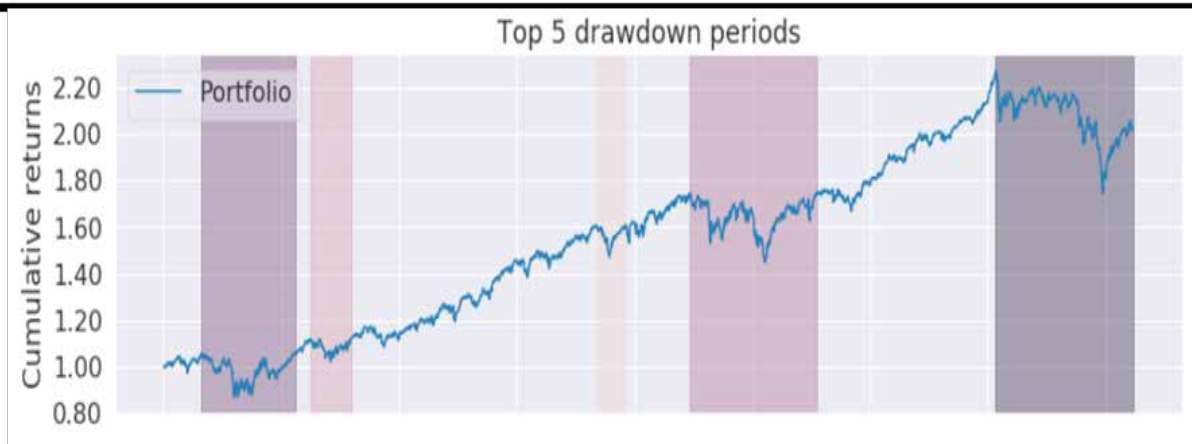
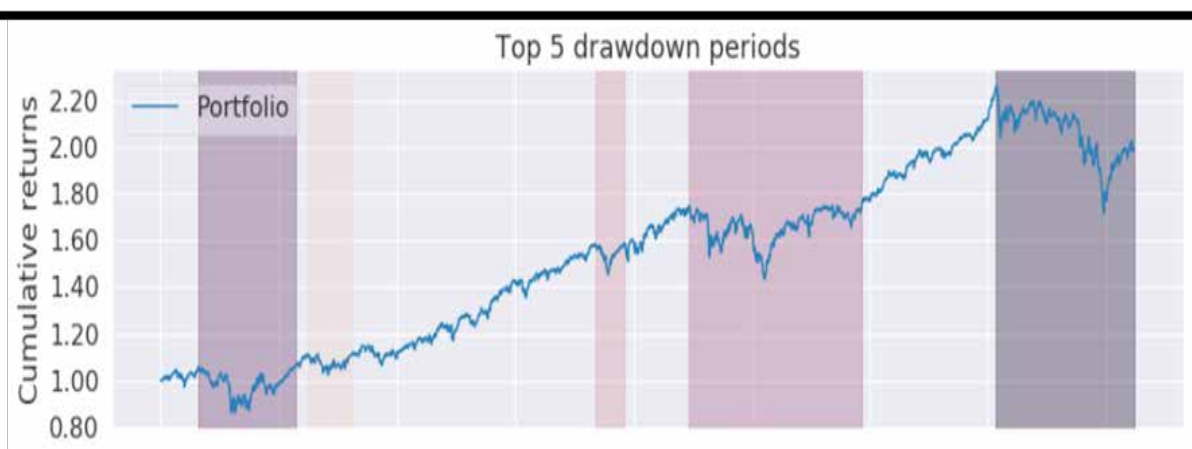


Figure 3 Returns Comparison

Deep Learning-Based Views Portfolio



Markowitz Portfolio



Equal Weights Portfolio

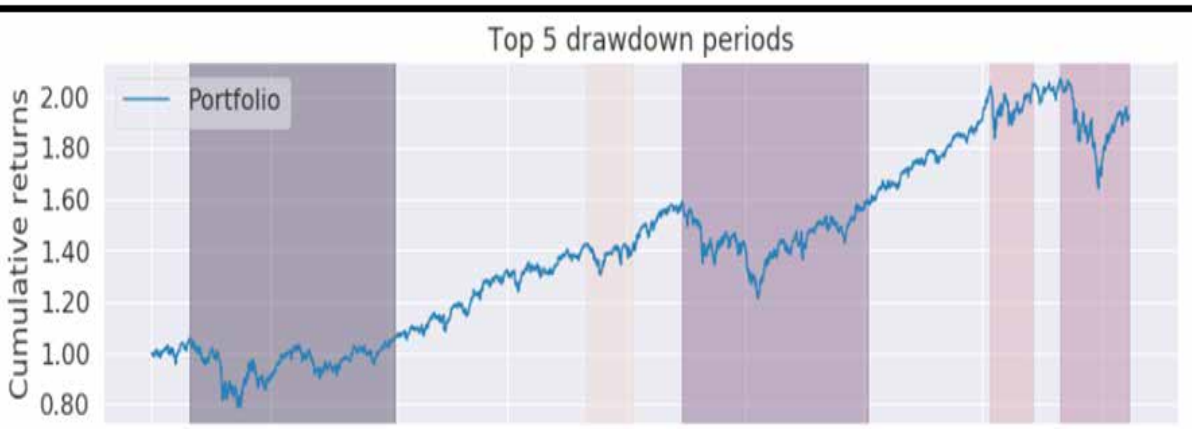
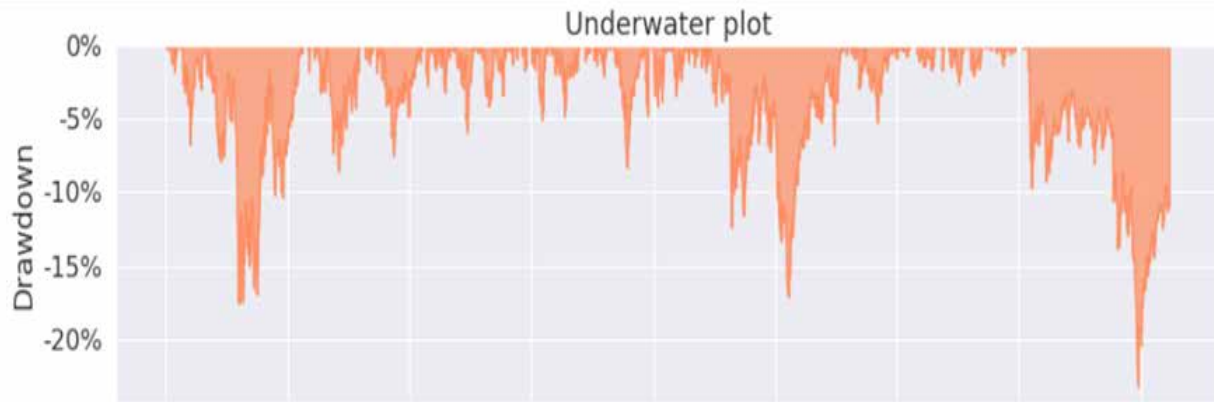
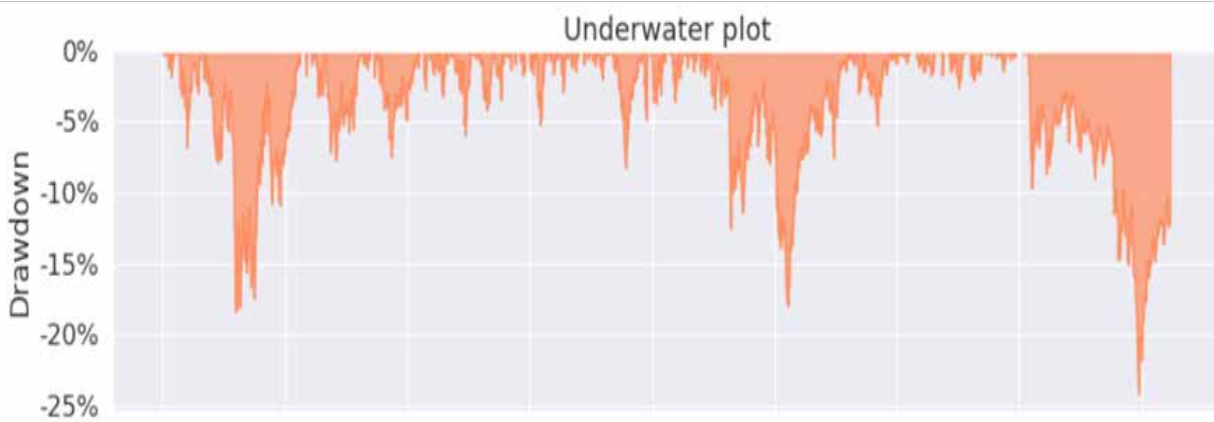


Figure 4 Drowdown Periods Comparison

Deep Learning-Based Views Portfolio



Markowitz Portfolio



Equal Weights Portfolio



Figure 5 Underwater Comparison

5. Conclusion

In this research, we developed the system framework and the core algorithm of LSTM time-series forecasting model for AI Robo-Advisors. We proposed a modular system and focused on integrating deep learning method and the Black-Litterman model to generate optimal asset allocation weight.

We presented an application, the Black-Litterman portfolio optimization integrating with deep learning-based investor views, to show that our system performs well in the task of portfolio rebalancing. In our application, portfolio optimization integrating with deep learning-based investor views, the annual return of the Black-Litterman portfolio using our deep learning-based investor views reaches 9.06%, which outperform the Markowitz portfolio and equal weights portfolio.

The contribution of this paper is that we have proposed an AI Robo-Advisor framework by integrating AI with Black-Litterman model for Robo-Advisor, which is an enhancement using deep learning-based views. The system we built is expandable and can be used as a framework for developing AI Robo-Advisors in automated investment management and support investors during the process of making investment decisions.

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APPENDIX A. Predicted Monthly Deep Learning-Based Investor Views

DATE	VIEW 1			VIEW 2			VIEW 3		
	Predict	Actual	Diff.	Predict	Actual	Diff.	Predict	Actual	Diff.
2017/1/2	-0.02%	0.17%	0.19%	-0.03%	0.11%	0.14%	0.20%	-1.40%	1.60%
2017/2/1	-0.04%	0.05%	0.08%	-0.03%	-0.26%	0.23%	0.20%	0.03%	0.17%
2017/3/1	-0.02%	-0.06%	0.03%	-0.04%	0.45%	0.49%	0.20%	0.38%	0.18%
2017/4/3	0.03%	0.15%	0.11%	-0.33%	0.35%	0.68%	-0.03%	0.53%	0.56%
2017/5/1	0.03%	0.43%	0.39%	-0.33%	0.86%	1.20%	-0.03%	0.22%	0.25%
2017/6/1	0.04%	0.06%	0.02%	-0.32%	-0.01%	0.31%	-0.03%	-0.65%	0.62%
2017/7/3	-0.34%	-0.54%	0.20%	0.06%	-0.54%	0.60%	-0.03%	-0.80%	0.77%
2017/8/1	-0.33%	-0.46%	0.13%	0.06%	-0.93%	0.99%	-0.11%	0.32%	0.43%
2017/9/1	-0.35%	0.05%	0.40%	0.11%	0.00%	0.11%	-0.11%	-0.54%	0.43%
2017/10/2	0.30%	-0.94%	1.24%	-0.04%	-0.81%	0.77%	-0.06%	1.13%	1.18%
2017/11/1	0.31%	0.14%	0.17%	-0.04%	-0.10%	0.06%	-0.03%	-0.17%	0.14%
2017/12/1	0.31%	0.00%	0.31%	-0.04%	-0.17%	0.13%	0.00%	0.02%	0.03%
2018/1/1	-0.27%	0.00%	0.27%	0.03%	0.00%	0.03%	1.04%	0.00%	1.04%
2018/2/1	-0.30%	-0.09%	0.21%	0.07%	0.35%	0.28%	1.04%	-0.06%	1.10%
2018/3/1	-0.30%	0.71%	1.01%	0.11%	0.60%	0.49%	1.05%	0.43%	0.61%
2018/4/2	-0.36%	-0.62%	0.26%	0.11%	0.00%	0.12%	-0.07%	-0.43%	0.36%
2018/5/1	-0.37%	-0.33%	0.04%	0.11%	-0.45%	0.56%	-0.07%	0.68%	0.75%
2018/6/1	-0.36%	0.01%	0.37%	0.11%	-0.60%	0.71%	-0.10%	0.02%	0.12%
2018/7/2	0.13%	0.35%	0.22%	-0.21%	0.16%	0.37%	-0.23%	-0.36%	0.13%
2018/8/1	0.14%	-0.05%	0.20%	-0.20%	-0.02%	0.18%	-0.23%	0.66%	0.89%
2018/9/3	0.21%	-0.32%	0.53%	-0.24%	-0.08%	0.16%	-0.25%	-0.46%	0.21%
2018/10/1	-0.02%	-0.44%	0.41%	-0.31%	-0.53%	0.22%	-0.21%	-1.03%	0.82%
2018/11/1	0.03%	-0.38%	0.41%	-0.32%	-1.01%	0.69%	-0.18%	-0.37%	0.20%
2018/12/3	0.03%	-0.41%	0.44%	-0.31%	0.04%	0.35%	-0.18%	-0.08%	0.10%
2019/1/1	0.45%	-0.60%	1.05%	0.44%	0.02%	0.43%	-0.23%	0.70%	0.93%
2019/2/1	0.46%	-0.77%	1.23%	0.31%	-0.51%	0.82%	-0.25%	-0.95%	0.70%
2019/3/1	0.46%	-0.17%	0.62%	0.32%	-0.21%	0.52%	-0.26%	0.72%	0.98%

APPENDIX B. Deep Learning-Based Portfolio Weights

DATE	IVW	IVE	IWO	IWN	EFA	EEM
2017/1/2	51.1%	38.0%	0.0%	0.0%	10.9%	0.0%
2017/2/1	50.9%	34.4%	0.0%	0.0%	14.7%	0.0%
2017/3/1	61.4%	30.5%	0.0%	0.0%	8.1%	0.0%
2017/4/3	47.1%	24.2%	0.0%	0.0%	28.7%	0.0%
2017/5/1	74.0%	21.0%	0.0%	0.0%	5.0%	0.0%
2017/6/1	85.4%	0.0%	0.0%	0.0%	14.6%	0.0%
2017/7/3	53.7%	32.9%	0.0%	0.0%	13.3%	0.0%
2017/8/1	40.5%	43.0%	0.0%	0.0%	16.4%	0.0%
2017/9/1	19.8%	54.6%	0.0%	0.0%	25.6%	0.0%
2017/10/2	21.0%	61.0%	0.0%	0.0%	18.0%	0.0%
2017/11/1	5.3%	53.9%	0.0%	0.0%	40.8%	0.0%
2017/12/1	9.4%	53.5%	0.0%	0.0%	37.1%	0.0%
2018/1/1	2.5%	64.3%	0.0%	0.0%	33.2%	0.0%
2018/2/1	10.0%	48.8%	0.0%	0.0%	41.2%	0.0%
2018/3/1	10.0%	48.8%	0.0%	0.0%	41.2%	0.0%
2018/4/2	0.0%	52.1%	0.0%	3.6%	44.3%	0.0%
2018/5/1	0.0%	0.0%	0.0%	23.8%	76.2%	0.0%
2018/6/1	0.0%	0.0%	0.0%	26.3%	73.7%	0.0%
2018/7/2	0.0%	0.0%	0.0%	41.6%	58.4%	0.0%
2018/8/1	0.0%	0.0%	0.0%	29.7%	70.3%	0.0%
2018/9/3	0.0%	8.1%	0.0%	38.1%	53.8%	0.0%
2018/10/1	4.2%	55.3%	0.0%	33.6%	7.0%	0.0%
2018/11/1	0.0%	97.4%	0.0%	2.6%	0.0%	0.0%
2018/12/3	0.0%	96.0%	0.0%	0.0%	4.0%	0.0%
2019/1/1	0.0%	34.2%	0.0%	0.0%	65.8%	0.0%
2019/2/1	0.0%	20.2%	0.0%	0.0%	79.8%	0.0%
2019/3/1	0.0%	12.4%	0.0%	0.0%	87.6%	0.0%

MultiEchelon MultiChannel with Cogent nodes (MEMCC) MAC Protocol to Optimize the Performance of IoT implemented in Tourism Industry

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Abstract

Background: The Internet of Things (IoT) technically comprises of everything which is capable of connecting to the internet to send and receive information. Tourism is among the preeminent industries involving immense contrariety, where consumers speculate amenities at modest cost. IoT can play a vital role in tourism industry by realizing continual flow of data enabling travellers to perceive more about the journey and destinations, at the same time, business concerns can aggregate more information about the travellers. The intent of this paper is to analyse and evaluate the proficiency of IoT in the aggregation of information from distinct sources. The IoT innovations can influence tourism in numerous fields such as personalisation, real-time information, in-flight experience, streamlined operations, customer services, automation, tourism experience and maintenance. In this paper, Wireless Sensor Network (WSN) is implemented to monitor the critical events of a particular area. Time synchronization between the sensor nodes to reduce average end to end delay with the increase in number of sensor nodes in a network for critical and real-time data monitoring can be achieved by precisely predicting their wakeup/sleep timings. The idea evolves as a reduction in duty cycle, precise time scheduling of active/sleep cycles of the sensors and implementation of multichannelling to reduce the probability of collisions between data and control packets which prolongs the network lifetime and reduces the average end to end delay. The proposed MultiEchelon MultiChannel medium access control protocol with Cogent nodes (MEMCC) is capable of continuous monitoring of critical events in a very effective manner in multihop transmission networks. This work is an attempt to mitigate multichannel hidden terminal problem, multihop hidden terminal problem and to reduce the probability of collisions between data and control packets.

Methods

This paper implements IEEE 802.15.4 (ZigBee) protocol to realize WSN deployed to collect and monitor important information as well as critical events important for tourism industry such as smart key and smart luggage. The simulations are performed using QualNet 6.1 simulator on the two sensor networks each of 50 and 100 nodes having terrain area of $100 \times 50 \text{ m}^2$ and $100 \times 100 \text{ m}^2$ respectively. The three channels of frequency 2.4, 2.42 and 2.44 GHz are used, routing protocol exploited is Adhoc On-demand Distance Vector (AODV), energy model is MicaZ, battery model is Linear and application utilized is Traffic Generator. The performance metrics such as throughput (bps), average end to end delay (seconds), jitter (seconds), packets dropped due to contention access failure, average number of packets dropped and network lifetime (hours) are evaluated and compared for MultiChannel (MC), MultiEchelon MultiChannel (MEMC) and MultiEchelon MultiChannel with Cogent nodes (MEMCC) MAC protocols to verify that multiple frequency channels can optimize the network performance to efficiently collect the information required by tourism industry.

Results

The results verify that the implementation of MultiChannel (MC), MultiEchelon MultiChannel (MEMC) and MultiEchelon MultiChannel with Cogent nodes (MEMCC) MAC protocols has significantly enhanced the network performance. MEMCC has out performed MC and MEMC.

Conclusion

This work proves the suitability of WSN and IEEE 802.15.4 protocol to contribute effectively and efficiently in IoT for tourism. The main objective is to optimize the network performance by implementing MultiEchelon MultiChannel with Cogent nodes (MEMCC) MAC protocol and to draw the attention of researchers in this area.

Keywords

Underwater wireless sensor network, Slotted Cyclic Quorum, Influence nodes, 2.4 GHz, Underwater EM Wave Communication, multihop hidden terminal, multichannel hidden terminal.

1. Introduction

MultiEchelon MultiChannel with Cogent nodes (MEMCC) MAC protocol is proposed for the deployed wireless sensor networks to realize Internet of Things (IoT) to enhance the monitoring and data aggregation of important information to help tourism industry. The proposed protocol is capable of continuous monitoring of critical events in a very effective manner in multihop transmissions.

The research problem considered in this paper is to implement the mutual exclusion of the active/sleep time slots of the sensors (Reduced Function Devices) by the utilization of the concept of multiechelon. It is further improved by varying the active/sleep time slots of coordinators (Full Function Devices) to effectively relay the data packets towards the sink node. The goal is to achieve more reduction in the number of contending nodes by utilizing the concept of multichannel to enable the multiple parallel transmissions and receptions reducing the number of redundant packets and collisions.

In the future, the development of efficient mechanisms to enhance the performance of multiechelon multichannel with cogent nodes MAC protocol to mitigate multichannel hidden terminal problems will be considered. The protocol will be an attempt to reduce collisions, idle listening, deafness conditions and triple hidden terminal problems.

The major contributions of this paper are as follows. It refers the multihop hidden terminal and long delay hidden terminal problems. A multiechelon based model has been developed with a mechanism which utilizes the time

slots and cogent nodes to prolong the network lifetime and to reduce average end to end delay in wireless sensor networks with sinks able to receive parallel transmissions using multiple transceivers.

This paper is organized as follows. Section 2 acquaints with the related work. Section 3 defines preliminaries and illustrates the computations. Section 4 describes the network models, simulation scenarios and the evaluation and analysis of simulation results. Finally, section 5 concludes the work and proposes the future scope.

2. Related Work

This section introduces the related work as many researchers are working in this field of research. I. F. Akyildiz *et al.* [1, 2] recognize research challenges, mainly focusing on protocol issues, hardware issues and a cross-layer design approach for UWSNs. The elemental technology used in the physical layer of underwater acoustic sensor networks is acoustic communication, as optical signals and electromagnetic signals are unsuited due to high absorption, scattering and attenuation, respectively, in the aqueous environments. They are different from terrestrial sensor networks in many attitudes: 3-dimensional space, frequency dependent transmission range, floating node mobility, longer delay, low and distance dependent bandwidth, and many more. The propagation velocity of the acoustic waves underwater is approximately 1500 m/s and the available bandwidth at a few kilometers is of the order of 10 kHz [2].

In 1997, W. Luk *et al.* [3] have presented two novel suboptimal algorithms for mutual exclusion in distributed

systems based on modification of Mackawa's grid based quorum scheme and idea of difference sets in combinatorial theory. The cyclic quorum scheme for the square grid configuration, the triangle configuration with a row and the triangle configuration with a column are illustrated.

In 2007, Y. Chen *et al.* [4] have proposed a novel Ordered CSMA which is a collision free medium access control protocol for underwater acoustic sensor networks. It has merged the concepts of CSMA and round robin scheduling. The important technical aspects of ordered CSMA before carrier passing and after carrier passing, transmission order, packet train consisting of ARQ and data packets, idle time out counter, error tolerance and network maintenance are elaborated. The simulation results have evaluated and compared the average end to end delay and throughput for three different MAC protocols which are ordered CSMA, TDMA and Slotted FAMA. The simulation outcomes project the significant improvement in the network performance by reducing the collisions.

In 2007, M. Molins *et al.* [5] have developed Slotted FAMA MAC protocol for underwater acoustic networks. It is founded on a channel access scheme named as Floor Acquisition Multiple Access (FAMA) which merges both carriers sensing and an interaction between transmitter and receiver before the transmission of data. It utilizes time slotting to eliminate the need for excessively long control packets which saves energy. The implemented algorithm, ARQ, the exposed terminal problem, Back-off algorithm, transmission priority, train of packets, slot time and packet priority are elaborated. The simulation results have evaluated an average number of neighboring nodes, average throughput per node and average end to end delay at different transmission ranges. The results prove the capability of Slotted FAMA to avoid data packet collisions irrespective of the packet size.

In 2007, A. Syed *et al.* [6] drew the attention of researchers to understand the influence of location dependent propagation latency on medium access control (MAC) protocols by using ALOHA as a case study. The utilization of guard bands in transmission slots to handle spatial uncertainty is introduced. The impact of varying guard band length and varying maximum delay is analyzed. Also, the analysis of ALOHA with guard bands is performed. The simulation results have evaluated and compared the influence of propagation delay on normalized throughput

for different values of ALOHA parameters which projects the enhancement in normalized throughput.

In 2008, A. Syed *et al.* [7] have proposed a new class of medium access control protocols for underwater acoustic sensor networks named as T Lohi. The space time uncertainty and deafness conditions are identified. The implementation of low power wake-up receiver and a novel tone based reservation mechanism that utilizes space-time uncertainty and high latency to count contenders and to detect collisions. The evaluation of the ratio of maximum throughput to the channel utilization with respect to the packet duration is performed. Also, the influence of mean offered load and network size on the number of packets lost is evaluated. The impact of mean offered load on Jain's fairness index is also calculated for different T Lohi protocols.

In 2008, T. H. Nguyen [8] have designed and implemented an energy efficient MAC protocol for underwater acoustic sensor networks. The main objective is to conserve energy by implementing dynamic duty cycling and by reducing the idle listening. The fundamentals of the cyclic quorum system and dynamic duty cycling are elaborated with flowcharts, operations and packet structures. The evaluation and comparison of simulation outcomes such as throughput, delay and power consumption for twelve different network modules are performed.

In 2008, L. Hong *et al.* [9] have optimized the performance of underwater sensor networks by implementing the lightweight synchronization technique, different transmission time allocation and the guard time to avoid collision with the sleep strategy to save energy. The proposed TDMA based MAC protocol is very suitable for high traffic load cases.

In 2010, R. Zhang *et al.* [10] appraise the fundamental requirement of neighbor discovery in underwater acoustic sensor networks with floating node mobility. The wormhole attack can be used to make distant nodes falsely accept each other as a neighbor, which cannot be solved by cryptographic methods. The proposed protocols are based on the estimation of Direction of Arrival (DoA) to prevent the wormhole attack without the requirements of accurate time synchronization and localization. The impact of direction of arrival, number of nodes, transmission range, velocity of nodes and multiple wormhole links on the probability of false neighbors acceptance and on the probability of true neighbors acceptance are evaluated and compared for different protocols.

In 2012, Z. Zhou *et al.* [11] refer “triple hidden terminal problems”. The three problems, namely new hidden terminal, multichannel hidden terminal and long delay hidden terminal problems are identified and studied. A novel cooperative multichannel MAC (CUMAC) protocol for long delay underwater sensor networks is proposed. The concepts of cooperative collision detection, heterogeneous collision region, redundant collision notification and tone pulse sequence are elaborated. The simulation outcomes such as the influence of input traffic per node on the throughput and energy consumption is evaluated and compared for different protocols. Also the impact of a number of channels, packet lengths, number of tone pulses in a tone and input traffic per node is analyzed on throughput, delay and the probability of false alarms.

In 2013, R. Thalore *et al.* [12] have evaluated the QoS of energy efficient ML-MAC protocol for wireless sensor networks. The prime objective is to reduce the power consumption by controlling the usage of the radio transceiver unit, to prolong the network lifetime, to prevent the collisions and to achieve low duty cycle. The simulation results have evaluated and compared the performance parameters such as network lifetime, total data units received, throughput, end to end delay and jitter for ML-MAC and IEEE 802.15.4 MAC protocols. The ML-MAC has outperformed the IEEE 802.15.4 MAC protocol.

In 2015, Vikas Raina *et al.* [13] has evaluated the QoS of square grid topology with four different orientations of packet routing. The calculations of energy consumed per bit, signal to noise ratio and transmission loss are performed. The simulation outcomes have evaluated and compared the throughput, end to end delay, residual battery and network lifetime for the four different packet routing schemes.

In 2015, Manju Khurana *et al.* [14] have proposed improved time synchronization scheme for ML-MAC protocol utilized in WSNs with relay nodes. The influence of appropriate time scheduling, time-drift and relay nodes are thoroughly analyzed and evaluated. The objective is to prolong the network lifetime along with the optimization of important performance metrics. The simulations are carried out on the four different scenarios of areas $100\text{m} \times 100\text{m}$, $300\text{m} \times 300\text{m}$, $400\text{m} \times 400\text{m}$ and $500\text{m} \times 500\text{m}$ having the number of sensors deployed 100, 900, 1600 and 2500 respectively. The simulation results such as network lifetime, the number of data packets dropped due

to contention access failure, unicast received throughput and average unicast end to end delay are evaluated and compared for different number of sensor nodes utilizing ML-MAC, ML-MAC with drift and ML-MAC with drift and relay nodes. The results verify that the implementation of drift and relay nodes have improved the network performance.

In 2017, Jeetu Sharma *et al.* [15] have developed a Caucus medium access control (CMAC) protocol for WSNs in smart grids. The prime objectives are to prolong the network lifetime and to reduce the end to end delay by mitigating the energy hole problem and by eliminating bottlenecks. The power distribution grid of 1500 MVA using ETAP simulator is designed. The mathematical model of CMAC protocol is presented with the elaboration of synchronization techniques utilized. The simulations are carried out on two networks having a number of nodes 242 and 483 deployed in the areas of $100\text{m} \times 100\text{m}$ and $200\text{m} \times 100\text{m}$, respectively. The simulation results have evaluated and compared the network lifetime, throughput, average end to end delay, jitter, successful data delivery ratio and the number of alive nodes for the protocols such as IEEE 802.15.4, CMAC and CMAC with relay nodes. The results have verified that the utilization of CMAC protocol has significantly improved the network performance.

In 2013, Sandra Sendra *et al.* [16] have performed a set of measurements of electromagnetic (EM) waves at 2.4 GHz in underwater environments. The water conditions are fixed and the behavior of EM waves as a function of several network parameters such as the working frequency, data transfer rates and modulations are analyzed. The output data rates are calculated at different frequencies and distances.

Ali Elrashidi *et al.* [17] presented a comprehensive study of electromagnetic waves underwater propagation for a wireless sensor network at a resonance frequency of 2.4 GHz. A mathematical model for the path loss due to attenuation of electromagnetic waves under the sea and pure water is introduced. A bow tie antenna is used for high gain to compensate the high path loss. A reflection model is introduced to illustrate the impact of air-water and water-sand interfaces as a function of distance between sensors and water depth. The path loss is evaluated and compared as a function of resonance frequency at different distances between the sensors for pure and sea water. A high gain bow tie antenna is designed and the results such

as radiation patterns, return loss, voltage standing wave ratio, input impedance and antenna gain at 2.4 GHz are calculated.

Benoit Letre *et al.* [18] performed the analysis of throughput and delay of unslotted IEEE 802.15.4 protocol as it is a protocol offering high reliability as a low power and low data rate protocol. The maximum throughput and minimum delay of the unslotted version of the protocol is analyzed at the resonant frequency of 2.4 GHz. The maximum throughput and minimum delay are calculated at different operating frequencies and at various address sizes. Finally, the comparison of the bandwidth efficiency for 2.4 GHz and 868/915 MHz is performed and the minimum delay as a function of payload size at the frequency of 2.4 GHz is evaluated.

In 2011, F. Benedetto *et al.* [19] have introduced a persuasive estimator to determine the time-delay for PN signals for satellites utilizing a speedy triangular interpolator working on three samples of approximated dubiety in the neighborhood of coarse estimate dubiety. The attainment is evaluated in comparison with the traditional approaches founded on the interpolation, usually executed by a prolonged narrow-band over sampling or quick method of fitting of a few samples of a smoothed function of the dubiety function in the vicinity of its maximum.

Kan Yu *et al.* [20] have introduced a low jitter scheduling technique clarifying the dependence of TDMA scheduling for sensors and point out the correlations between the scheduling delays, overall quality control and focus on reducing jitter in scheduling. The values of normalized jitter at starting and ending time slots are evaluated.

In 2013, C. Chao *et al.* [21] concentrate on Multiple Rendezvous multichannel MAC (MM-MAC) protocol design for underwater sensor network. The probability of collision is analyzed and compared at different transmission range for one and three channel networks. Also, the evaluation of vulnerability interval is performed. The mathematical modelling of cyclic quorum and multichannel for single sink and multiple sink models is presented. The utilization of slotted FAMA in a collision free network, the utilization of MM-MAC in a collision free network and the utilization ratio of MM-MAC to slotted FAMA is calculated and compared for different sizes of control and data periods. The simulation results such as throughput, retransmission overhead, power consumption

and end to end delay are calculated and compared to MM-MAC, slotted FAMA and slotted PCAM respectively, for both the single sink and multiple sink models. The MM-MAC protocol has significantly enhanced the network performance by reducing the probability of collisions.

In 2017, A Tedeschi *et al.* [22] have considered the detrimental events in WSNs inducing packet losses due to either misconducting nodes or intervention on the wireless channels. The objective is to design an efficient mechanism to enhance the performance of the previous approaches by exploiting a statistical model for determining optimal system thresholds based on the variances of RSSI and LQI. The results illustrated that the proposed model is accurate and leads to an optimal fine-grained analysis of the underlying causes of packet losses.

Mare Aoun *et al.* [23] consider the problem of modelling the transmission of real time data from a single node of a wireless sensor network to the next hop or access point. A thresholding policy is introduced that is supported by an analytical model and it is responsible for deciding whether to transmit a data packet or drop it and transmit the next one. A sensor system model, packet delivery ratio calculation and probability of an empty system are introduced. The packet delivery ratio gain with respect to the packet arrival rate is evaluated.

In 2005, H. Shao *et al.* [24] have received a patent associated with medium access control protocol for WSNs. The main objective is to manage the network access in a distributed manner. The transmission and reception of packets are synchronized to prevent collisions, channel access failures and bottlenecks. It is capable of updating the frame structure on a periodic basis if a configuration of the network changes over time.

In 2015, H. Shao *et al.* [25] have achieved patent regarding the MAC protocol communication method and device for synchronous WSN. The invention constitutes of a MAC protocol and a device for a synchronous WSN. It utilizes periodic scheduling and each cycle period of a node is divided into synchronization time periods, busy tone monitoring/sending time period, channel appointment time period and sleep time period. It also utilizes relay nodes to combine the channel appointment time period and route selection together to reduce overheads and for simple realization.

In 2013, F. Sultan *et al.* [26] have received a patent titled as wireless sensor network with energy efficient

protocols. It includes energy efficient protocols, and a network of external sensors in communication with a data sink. An algorithm is proposed which is able to decrease energy consumption by modifying the S-MAC protocol. The routing protocol based upon cluster head rotation is further integrated into the algorithm.

In 2014, Ma Li *et al.* [27] have optimized the performance of wireless sensor networks by prolonging its lifetime. The protocol has implemented different wakeup time tables for the sender and able to predict the wakeup time of the receiving nodes. According to the invention, the different wakeup time between the nodes is assured as the offset value is selected based on the wakeup time of the neighbor node. The energy consumption caused by idle interception can be reduced efficiently and energy is saved as the wakeup time of the receiving node is predicted accurately.

3. Calculations

3.1. Preliminaries

The preliminaries are as follows:

1. A wireless sensor network $U(S, E)$ is deployed comprising of n static sensors, where S is the set of sensors and E is the set of radio links.
2. There is a microwave communication link between two sensors.
3. The sink and a sensor node are able to communicate via different coordinator nodes using multihop communication and using single hop communication if they are within the communication range of each other.
4. The energy consumed by all operations of communication is considered.
5. It is assumed that by using radio positioning techniques the sink is aware of the location of the sensors.
6. All sensors have the same data generation rate r .
7. Each node (RFD) is equipped with one half-duplex modem and sink node (FFD) is equipped with three transceivers having different frequency channels.
8. The sensor nodes are time synchronized by using a clock synchronization techniques. Both the long and time varying propagation delays are considered.
9. Each node knows the identifications (IDs) of its one-

hop neighbors. This information can be collected during the network initialization phase.

3.2 The Analysis of Collisions

In this section, we analyze if propagation delay has an effect on collision probability. We use slotted ALOHA as an example to accomplish our analysis [23]. Suppose that the source and destination nodes are O and R , respectively. The packet transmission time is T_t while the propagation time between two nodes j and k is denoted as P_{jk} . We define *vulnerability interval* as the duration that collisions may happen. As shown in Fig. (1), for the packet p_1 to arrive at R from O , the vulnerability interval is between $t_0 + P_{RS}$ and $t_0 + P_{OR} + T_t$, where $t_0 + P_{RS}$ is the time that the head of another packet p_2 , from S in this example, arrives at R while $t_0 + P_{OR} + T_t$ is the time that the tail of p_1 arrives at R . The earliest and the latest time for a possible collision happen as the tail of p_2 collides with the head of p_1 and as the tail of p_1 collides with the head of p_2 , respectively. That is, p_1 collides with p_2 , if the head of p_2 arrives at R during the vulnerability interval [23].

This means that p_1 collides with p_2 , if the following conditions shown in Eqs. (24) and (25) hold [23]:

$$t_0 + P_R + T_t \geq t_0 + P_R \quad (1)$$

$$t_0 + P_R \leq t_0 + P_R + T_t \quad (2)$$

Given the propagation speed of 3×10^8 m/s in a microwave link and denoting the distance between nodes j and k as Δ_{jk} , Eqs. (1) and (2) can be rewritten as Eq. (3) [23].

$$(2 \times 10^{-7}) \times \left(\frac{\Delta_a}{2 \times 10^7} - T_t \right) \leq \Delta_R \leq (2 \times 10^{-7}) \times \left(\frac{\Delta_a}{2 \times 10^7} + T_t \right) \quad (3)$$

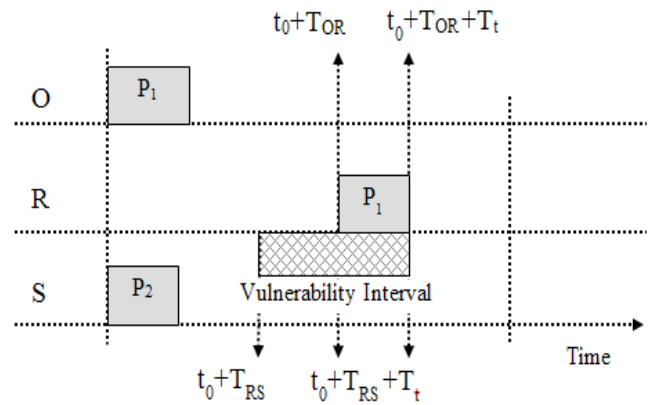


Fig. (1). The timing diagram of vulnerability interval.

Given Δ_a , we can obtain the vulnerability range, which the potential interference nodes may reside in from Eq. (3). Denoting $(2 \times 10^{-7}) \times \left(\frac{\Delta_a}{2 \times 10^7} - T_t \right) = L_{in}$ and $(2 \times 10^{-7}) \times \left(\frac{\Delta_a}{2 \times 10^7} + T_t \right) = L_{out}$, respectively, the ring like

vulnerability range with respect to node O is marked in Fig. (2). Supposing that there are Y contending nodes in an area of 1 m^2 while each node transmits a packet with probability $\wp$, the total number of nodes in the vulnerability range is $Y\pi(L_{out}^2 - L_n^2)$. Any transmission from nodes in the vulnerability range produces a collision to the transmission of node O . Therefore, the collision probability is $1 - (1 - \wp)^{Y\pi(L_{out}^2 - L_n^2)}$. To reduce this probability, for a given $\wp$, we can decrease the value of Y , $(L_{out}^2 - L_n^2)$, or both. To lessen the difference between L_{out}^2 and L_n^2 , the values of T_t and/or Δ_σ should be decreased. However, in a network where the packet size and transmission range are determined, these values are also fixed. Thus, reducing the number of contenders Y is the only way to lower the collision probability [23].

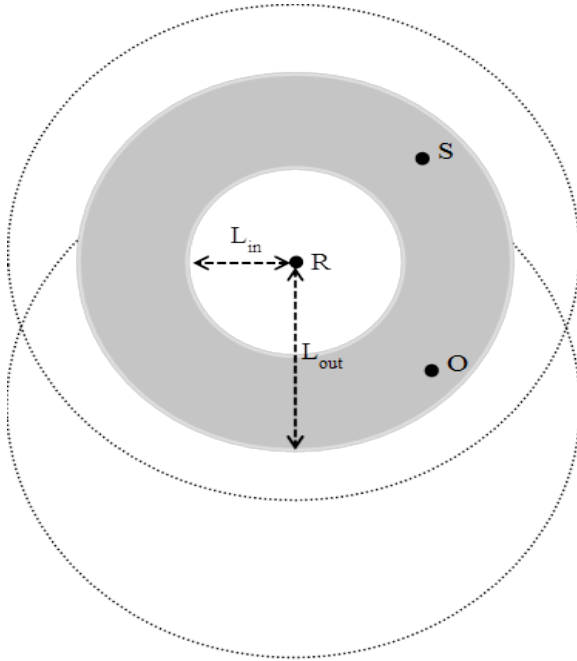


Fig. (2). The diagram of vulnerability range.

It can be further reduced by the implementation of MEMCC. The timing diagram of reducing the vulnerability interval by implementing the concept of multichannel is shown in Fig. (3). The data packets P_{f1} and P_{f2} are transmitted at two different frequencies f_1 and f_2 by the sensor nodes O and S to the receiver node R simultaneously. As the receiver is equipped with multiple transceivers, both the packets are received successfully without collision as their channel frequencies are different [23].

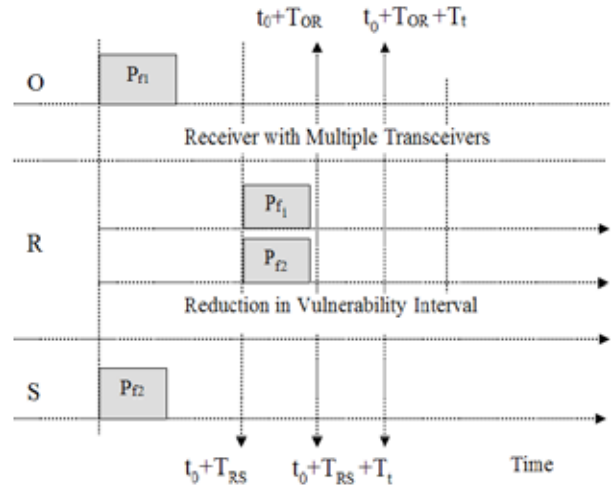


Fig. (3). The timing diagram of vulnerability interval with multichannel.

In Fig. (4), the comparison of collision probabilities between with echelon, without echelon and multichannel based MAC protocol for different number of sensors having same density.

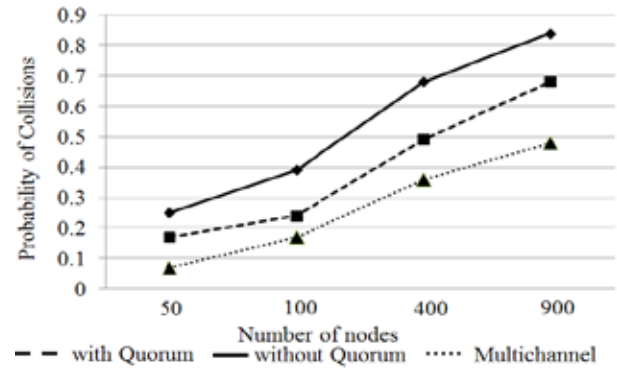


Fig. (4). The comparison of probability of packet collisions.

The four networks are constituted of 50, 100, 400 and 900 nodes, uniformly deployed in the areas of $50 \text{ m} \times 100 \text{ m}$, $100 \text{ m} \times 100 \text{ m}$, $200 \text{ m} \times 200 \text{ m}$ and $300 \text{ m} \times 300 \text{ m}$ respectively. It is clear that with the increase in the number of sensors the probability of collision also increases. Also, implementing the concept of echelon and multichannel reduces the collision probability significantly. This verifies the necessity of using MEMCC MAC protocol and motivates our work.

MultiEchelon concept implements the adaptive active/sleep time slots for the sensors. The time slots are scheduled in a manner that the whole terrain area can be effectively monitored for the whole time. The wireless sensor network considered to perform simulations is shown in Fig. (5) which constitutes of static sensor nodes

able to utilize only one channel out of the three available channels of frequency f_1 , f_2 and f_3 of 2.4, 2.42 and 2.44 GHz respectively. The sink node is equipped with three transceivers able to transmit and receive data at three channels simultaneously. The concept of multiechelon is implemented to achieve the mutual exclusion of active/sleep cycles of the neighboring nodes. In this network, the mutual exclusion is further increased by varying the start time (τ_1 , τ_2 and τ_3) of the neighboring nodes to prevent the collisions due to the simultaneous transmission of data. The network is also strengthened by the deployment of cogent nodes that are full function devices (FFDs) able to communicate with reduced function devices (RFDs/sensors) as well as FFDs having double battery power than the sensor nodes. These nodes are having larger communication range, longer lifetime and fast computational capacity. These are responsible to establish multihop communication in the network by relaying the data from farther nodes to the sink. These nodes always remain active throughout the simulation period to relay the data packets. The prime objective is to maintain the efficient scheduling of the sensors active/sleep cycles and effective utilization of three frequency channels to mitigate collisions and interferences from the neighboring nodes. The effective time schedule and efficient allocation of multiple channels to the sensors with a sink mounted with three transceivers is presented in Fig. (5).

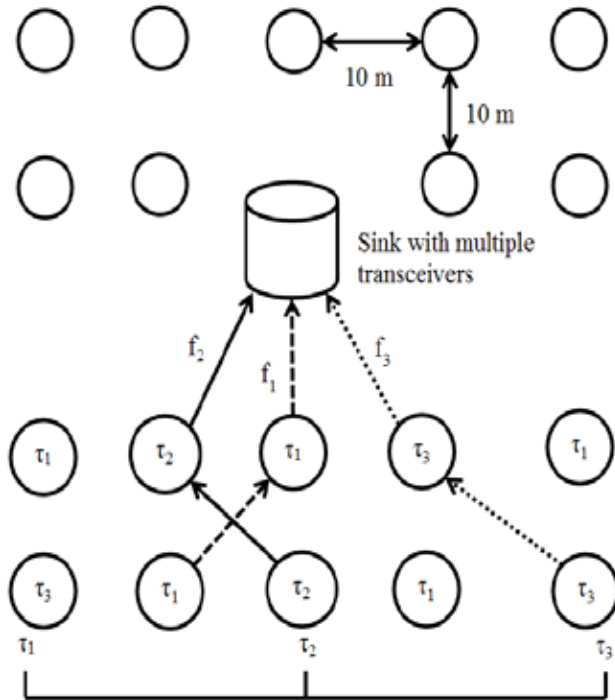


Fig. (5). The simulation architecture of MEMCC MAC protocol.

Figure (6) presents the timing diagram of active/sleep scheduling of nine different sensor nodes. It signifies that the three neighboring nodes, which are within the communication range of each other should transmit data at different time slots to prevent the collisions and to reduce the number of contending nodes too. For example, if node A is transmitting at time slot τ_1 , then node B should transmit at time slot τ_2 and node C at time slot τ_3 . Although, the deviation in active time slots is able to initiate transmissions at different times, but at the receiver/sink the probability of reception of data packets simultaneously is still very high due to a large number of transmitters. The data packets transmitted by two sensors active during the same time slot which are far away from each other may cause a collision and interference at the receiver due to single transceiver and same frequency. To further reduce the number of contending nodes the concept of utilization of multiple channels of allocating different frequency channels to the neighboring nodes and mounting multiple transceivers at the sink is very effective. In this work, three different frequency channels and a sink with three transceivers are implemented.

The process of data transmission and data reception of the proposed MEMCC MAC protocol with two sensors is shown in Fig. (7). It illustrates that, the sink polls each sensor sequentially. A sensor with data to transmit does so immediately after it is polled and in the absence of data, sends a small packet to just acknowledge the receipt of the poll. Then the sink estimates the propagation delay for each sensor based on the measurement of the round trip time. A sensor may be re-polled immediately if its data is not received correctly. Also, if no response is obtained in response to a poll, the sink may repeat polls subject to limit the number of retransmissions. After the uplink transmissions, the sink transmits the control messages to the sensors. The messages sent by the sink also contain the schedule according to which the sensors send back their acknowledgement packets (ACK). There are three different transmission frequencies of 2.4 GHz, 2.42 GHz and 2.44 GHz.

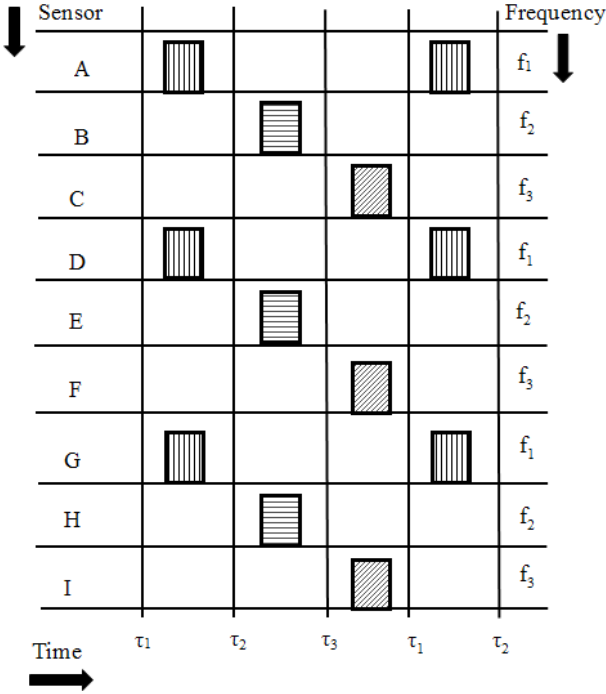


Fig. (6). The timing diagram of active and sleep scheduling in MEMCC MAC protocol.

The concept of cyclic quorum is utilized to improve time synchronization between the sensors in underwater wireless sensor networks. To further improve it the wakeup scheduling of the sensors active during the same time is varied by dividing the active/sleep time in different time slots. The influence nodes are deployed to increase the network connectivity along with synchronization to relay the data and control packets towards the sink nodes. The influence nodes are full function devices behave like network coordinator, having high battery power (mAh) with respect to other nodes to serve the network for longer time.

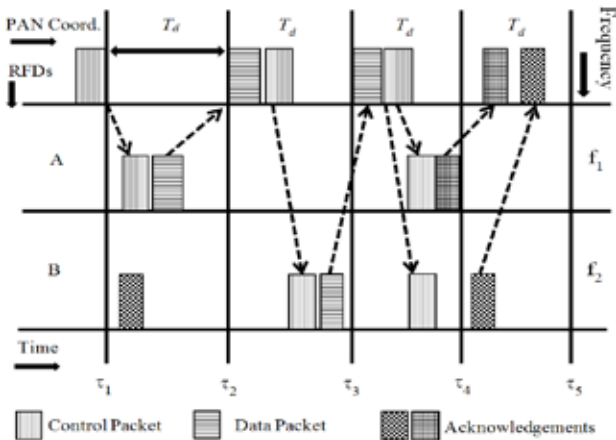


Fig. (7). The timing diagram of data transmission and reception in MEMCC MAC protocol.

The complexity of this method lies in the efficient implementation of the concept of echelon to achieve the appropriate mutual exclusion of the active/sleep time slots of the sensors and the employment of an optimal mechanism to determine the start time and the duration of active/sleep time slots of the coordinators to achieve the optimum network performance. Assume that the complexity of the underwater sensor networks deployed in this paper is $O(n)$, where n are the number of sensors in the network. It signifies that without the implementation of multiechelon all the sensors are contenders competing for the transmission slots. The utilization of multiechelon reduced the complexity to $O(n/\delta)$ by mutual exclusion, reducing the number of contending nodes by the factor of δ . The implementation of the concept of multichannel has significantly reduced the number of contending nodes, enabling parallel data transmissions and receptions.

4. SIMULATION RESULTS AND ANALYSIS

Figure (8) shows the general scenario of WSNs consisting of different types of sensor nodes used for collaborative monitoring.

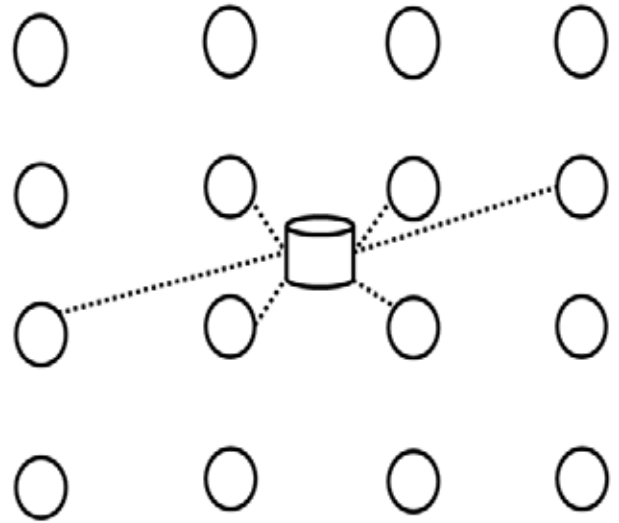
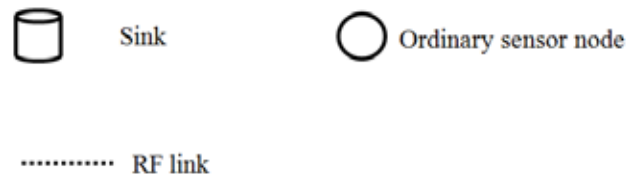


Fig. (8). General Scenario of WSN.

Legends used in Fig. (8).



The simulations are performed on two different wireless sensor networks deployed in the areas of 100m×50m and 100m×100m having the number of sensors 50 and 100, respectively. The twenty rounds of simulations are carried out on QualNet 6.1 simulator and the average value of all the twenty values is taken as the final results to improve its accuracy. The results are evaluated and compared to MC, MEMC and MEMCC. The prime objective is to prolong the network lifetime with the increase in number of sensor nodes in the networks. The simulation parameters and simulation results are presented in Tables 1 and 2 respectively.

Table 1. Simulation Parameters.

S. No.	Parameter(s)	Value(s)
1.	Total number of nodes	50, 100
2.	Number of PAN coordinator	1, 1
3.	Communication Protocols	
	RFDs to PAN coordinator	IEEE 802.15.4
	PAN to RFDs	IEEE 802.15.4
4.	Channel frequencies (GHz)	2.4, 2.42, 2.44
5.	Packet size (bytes)	38
6.	Packet interval (secs)	1
7.	Simulation Times (secs)	1500
8.	Battery (mAh)	300
9.	Transmission range (m)	10
10.	Terrain Area (m ²)	100×50, 100×100
11.	Energy Model	MicaZ
12.	Battery model	Linear
13.	Application	Traffic-Generator
14.	Number of Transceivers	
	PAN Coordinator	3
	RFDs	1

Table 2. Simulation Results.

S. No.	Parameter(s)	MC	MEMC	MEMCC
1.	Throughput (bps)			
	50 nodes	1212	677	715
	100 nodes	1664	1608	1710
2.	Average end to end delay (secs)			
	50 nodes	0.16065	0.09496	0.10726
	100 nodes	0.5191	0.2876	0.3759
3.	Jitter (secs)			
	50 nodes	0.1926	0.05342	0.05682
	100 nodes	0.7717	0.2719	0.3628
4.	Packets dropped due to CAF			
	50 nodes	7	0	0
	100 nodes	159	4	2
5.	Average number of packets dropped			
	50 nodes	21	20	7
	100 nodes	210.96	20.91	11.22
6.	Network lifetime (hours)			
	50 nodes	796.43	2206.53	2264.49
	100 nodes	179.77	573.92	595.8

4.1. The Influence on Throughput.

Figures (9), (10) and (11) evaluate and compare the values of throughput for the networks of 50 and 100 nodes respectively, for the different multichannel MAC protocols. Figure (9) demonstrates its comparison of MC, MEMC and MEMCC MAC protocols for the network of 50 nodes. Figure (10) illustrates the analysis and comparison of throughput of MC, MEMC and MEMCC MAC protocols for the network of 100 nodes. Figure (11) presents the comparison of throughput for both the networks having 50 and 100 nodes. The simulation results project that the values of throughput is higher for MC but degrades for MEMC and MEMCC MAC for the networks having less number of nodes. As the number of nodes increases in a network the MEMCC outperforms MC and MEMC protocols. It increases for the network of 100 nodes, which utilizes MEMCC protocol.

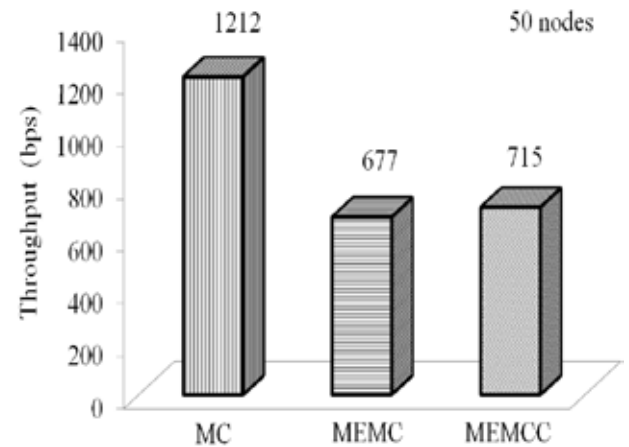


Fig. (9). The comparison of throughputs (bps) for 50 nodes.

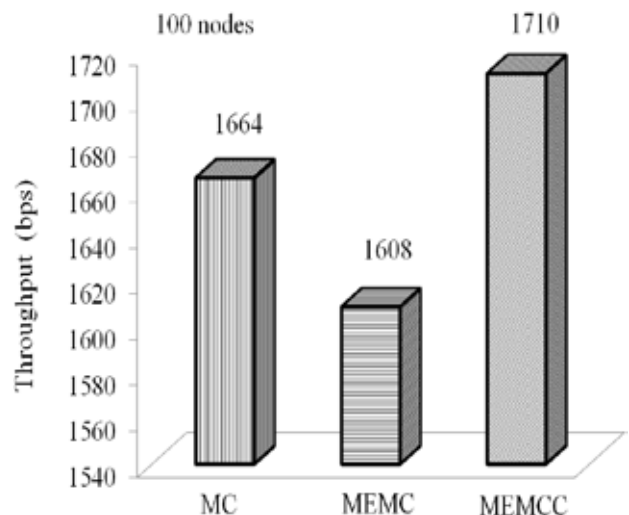


Fig. (10). The comparison of throughputs (bps) for 100 nodes.

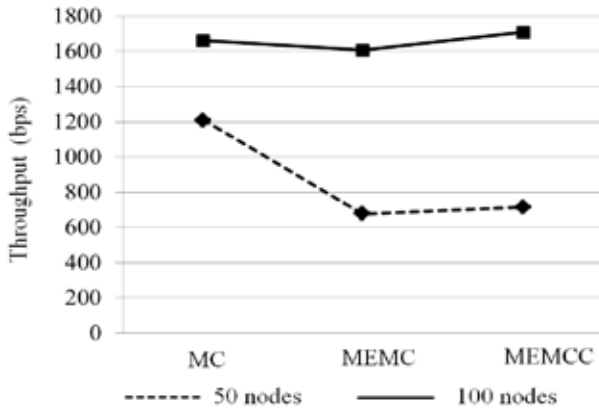


Fig. (11). The comparison of throughputs (bps) for 50 and 100 nodes.

Figure (9) demonstrates its comparison of MC, MEMC and MEMCC MAC protocols for the network of 50 nodes. Figure (10) illustrates the analysis and comparison of throughput of MC, MEMC and MEMCC MAC protocols for the network of 100 nodes. Figure (11) presents the comparison of throughput for both the networks having 50 and 100 nodes. The simulation results project that the values of throughput is higher for MC but degrades for MEMC and MEMCC MAC for the networks having less number of nodes. As the number of nodes increases in a network the MEMCC outperforms MC and MEMC protocols. It increases for the network of 100 nodes, which utilizes MEMCC protocol.

4.2. The Influence on Average End to End Delay.

Figures (12), (13) and (14) evaluate and compare the values of the average end to end delay for the networks of 50 and 100 nodes respectively, for the different multichannel based MAC protocols.

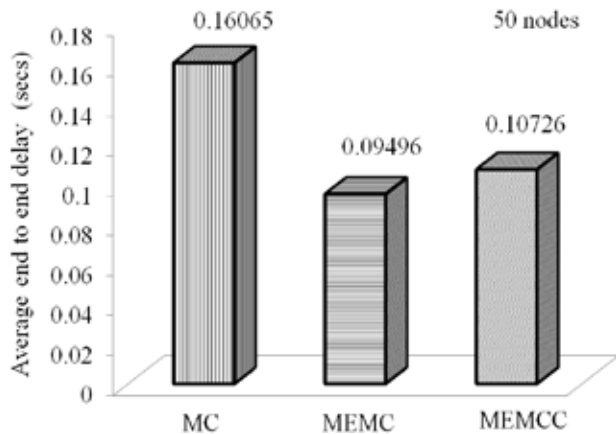


Fig. (12). The comparison of average end to end delays (secs) for 50 nodes.

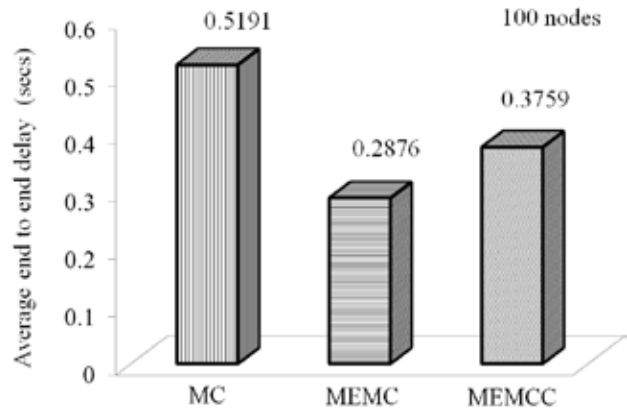


Fig. (13). The comparison of average end to end delays (secs) for 100 nodes.

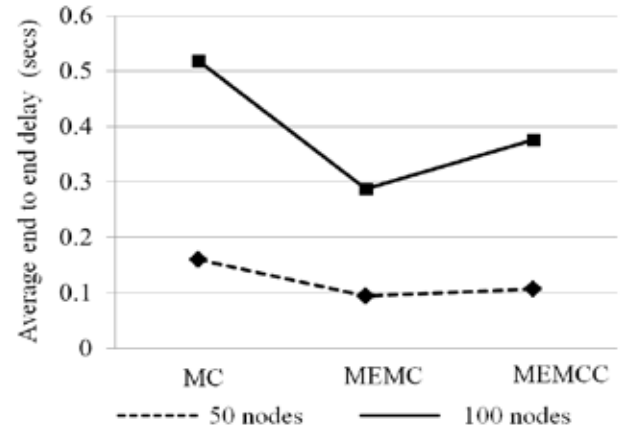


Fig. (14). The comparison of average end to end delays (secs) for 50 and 100 nodes.

Figure (12) demonstrates its comparison of MC, MEMC and MEMCC MAC protocols for the network of 50 nodes. Figure (13) illustrates the analysis and comparison of the average end to end delay of MC, MEMC and MEMCC MAC protocols for the network of 100 nodes. Figure (14) presents the comparison of average end to end delays for both the networks having 50 and 100 nodes. The simulation results project that the values of average end to end delay is higher for MC but reduces for MEMC and MEMCC MAC for both the networks. As the number of nodes increases in a network the MEMC and MEMCC outperforms MC protocol.

4.3. The Influence on Jitter.

Figures (15), (16) and (17) evaluate and compare the values of jitter for the networks of 50 and 100 nodes respectively, for the different multichannel based MAC protocols.

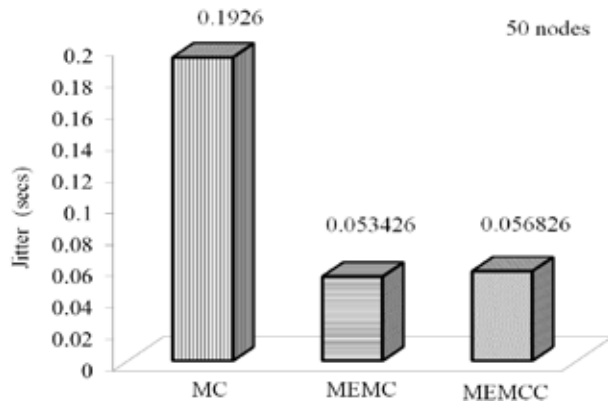


Fig. (15). The comparison of jitter (secs) for 50 nodes.

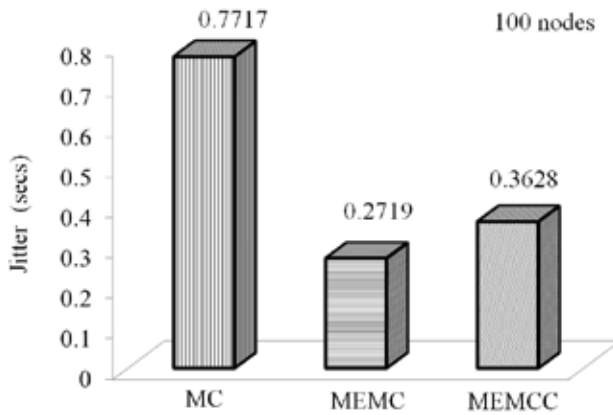


Fig. (16). The comparison of jitter (secs) for 100 nodes.

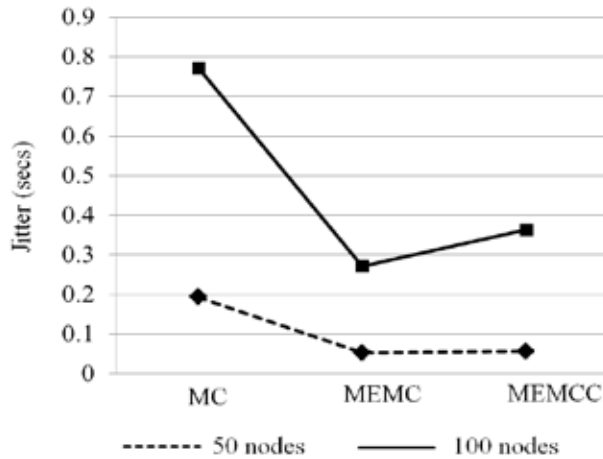


Fig. (17). The comparison of jitter (secs) for 50 and 100 nodes.

Figure (15) demonstrates its comparison of MC, MEMC and MEMCC MAC protocols for the network of 50 nodes. Figure (16) illustrates the analysis and comparison of jitter of MC, MEMC and MEMCC MAC protocols for the network of 100 nodes. Figure (17) presents the comparison of jitter for both the networks having 50 and 100 nodes. The implementation of the proposed protocol significantly reduces the jitter for both the networks.

4.4. The Influence on Packets Dropped due to CAF.

Figures (18), (19) and (20) evaluate and compare the values of the number of packets dropped due to contention access failure for the networks of 50 and 100 nodes respectively, for the different multichannel based MAC protocols.

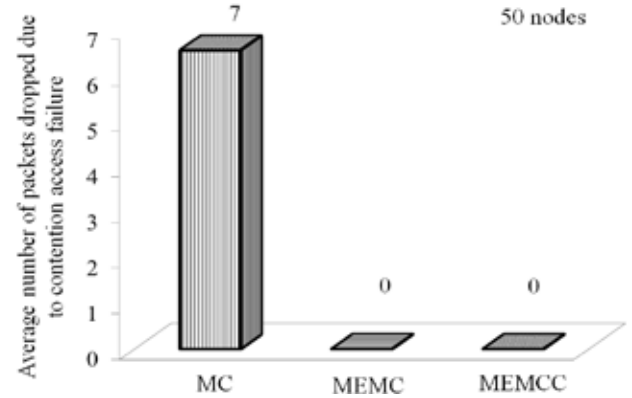


Fig. (18). The comparison of packets dropped due to CAF for 50 nodes.

Figure (18) demonstrates its comparison of MC, MEMC and MEMCC MAC protocols for the network of 50 nodes.

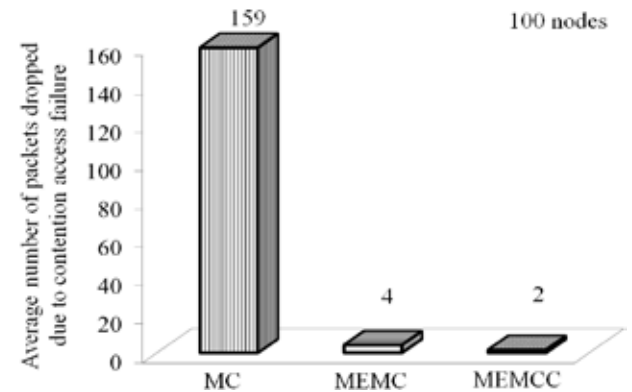


Fig. (19). The comparison of packets dropped due to CAF for 100 nodes.

Figure (19) illustrates the analysis and comparison of jitter of MC, MEMC and MEMCC MAC protocols for the network of 100 nodes. Figure (20) presents the comparison of packets dropped due to CAF for both the networks having 50 and 100 nodes. The implementation of the proposed protocol significantly reduces the average packets dropped due to contention access failure for both the networks. It signifies that the number of collisions is reduced with the generation of a large number of packets during contention access period.

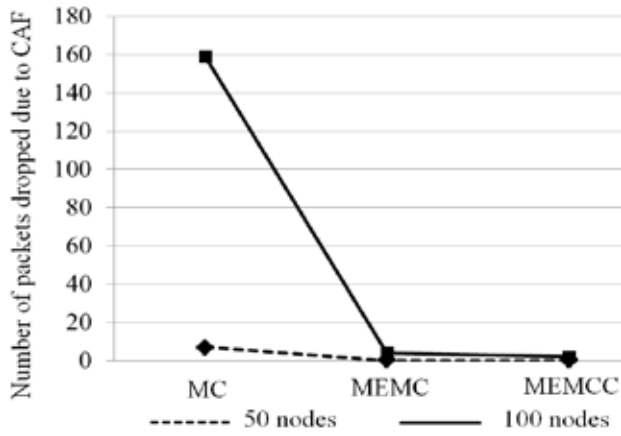


Fig. (20). The comparison of packets dropped due to CAF for 50 and 100 nodes.

4.5. The Influence on Average Number of Packets Dropped.

Figures (21), (22) and (23) evaluate and compare the values of average number of packets dropped for the networks of 50 and 100 nodes respectively, for the different multichannel MAC protocols.

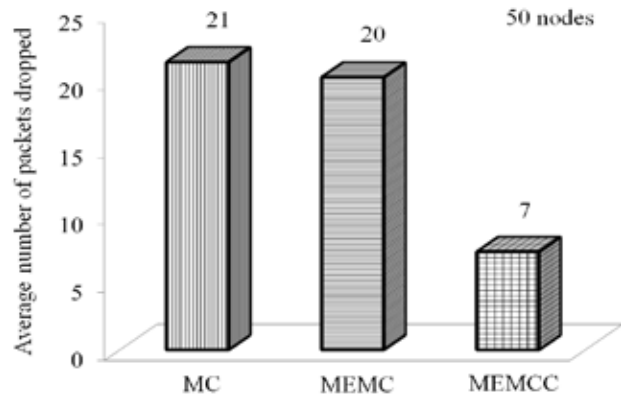


Fig. (21). The comparison of the average number of packets dropped for 50 nodes.

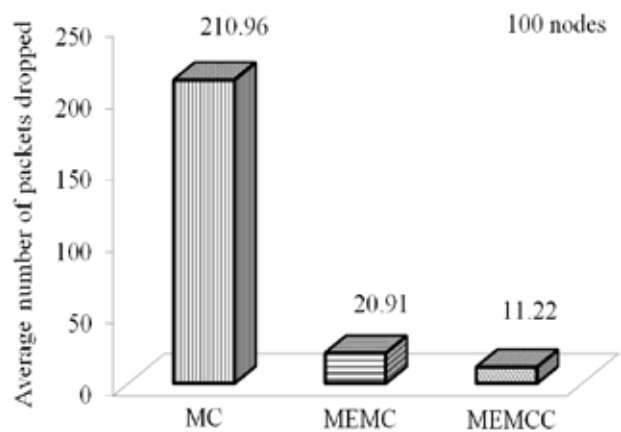


Fig. (22). The comparison of the average number of packets dropped for 100 nodes.

Figure (21) demonstrates its comparison of MC, MEMC and MEMCC MAC protocols for the network of 50 nodes. Figure (22) illustrates the analysis and comparison of the average number of packets dropped of MC, MEMC and MEMCC MAC protocols for the network of 100 nodes. Figure (23) presents the comparison of average number of packets dropped for both the networks having 50 and 100 nodes. The simulation results project that the values of average number of packets dropped is higher for MC but degrades for MEMC and MEMCC MAC for both the networks. The MEMCC outperforms MC and MEMC protocols.

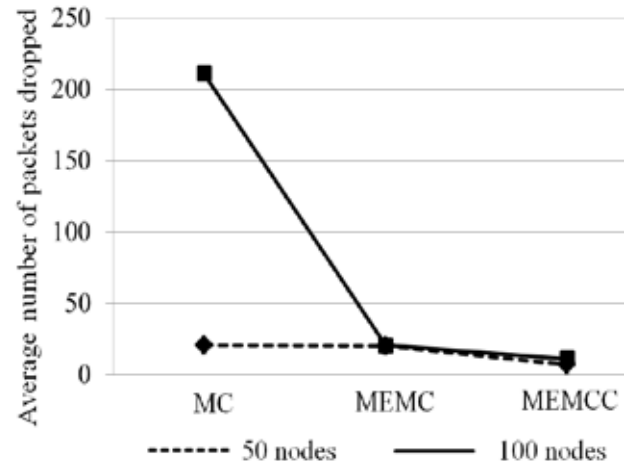


Fig. (23). The comparison of the average number of packets dropped for 50 and 100 nodes.

4.6. The Influence on Network Lifetime.

Figures (24), (25) and (26) evaluate and compare the values of network lifetimes for the networks of 50 an 100 nodes respectively, for the different multichannel MAC protocols.

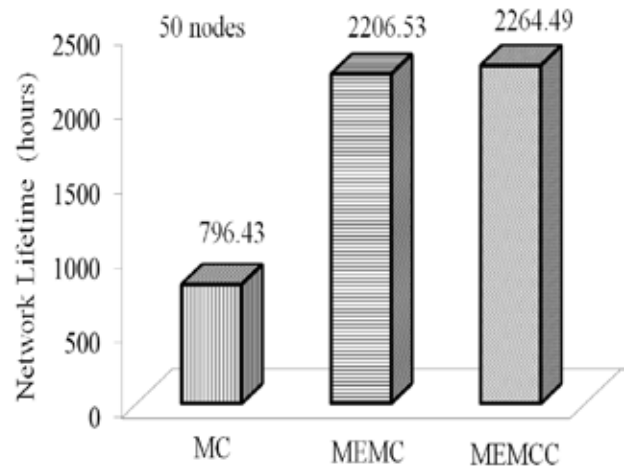


Fig. (24). The comparison of network lifetimes (hrs) for 50 nodes.

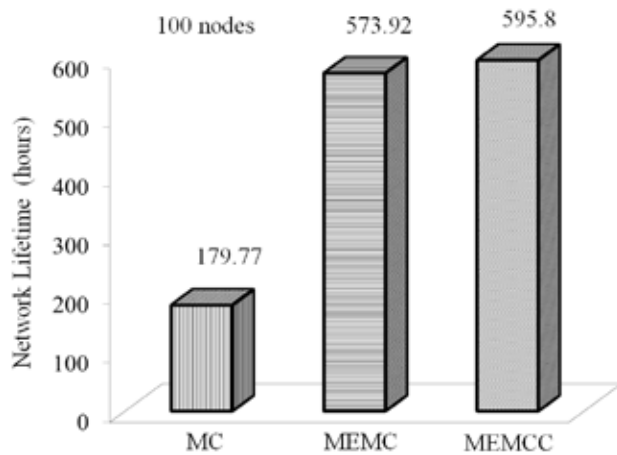


Fig. (25). The comparison of network lifetimes (hrs) for 100 nodes.

Figure (24) demonstrates its comparison to MC, MEMC and MEMCC MAC protocols for the network of 50 nodes. Figure (25) illustrates the analysis and comparison of network lifetime of MC, MEMC and MEMCC MAC protocols for the network of 100 nodes. Figure (26) presents the comparison of network lifetime for both the networks having 50 and 100 nodes. The simulation results project that the values of network lifetime have increased significantly with the implementation of MEMC and MEMCC MAC protocols. The prime objective to prolong the network lifetime of the networks of this work is achieved successfully.

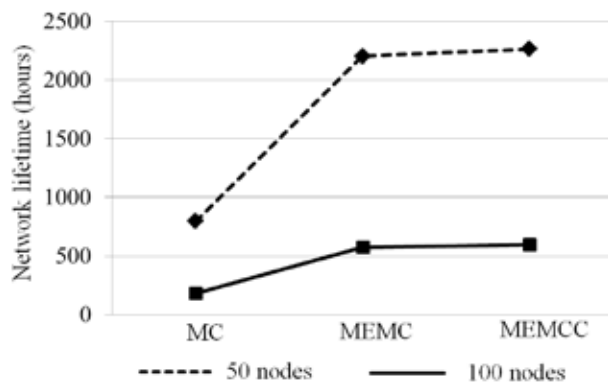


Fig. (26). The comparison of network lifetimes (hrs) for 100 nodes.

Figure (24) demonstrates its comparison to MC, MEMC and MEMCC MAC protocols for the network of 50 nodes. Figure (25) illustrates the analysis and comparison of network lifetime of MC, MEMC and MEMCC MAC protocols for the network of 100 nodes. Figure (26) presents the comparison of network lifetime for both the networks having 50 and 100 nodes. The simulation results

project that the values of network lifetime have increased significantly with the implementation of MEMC and MEMCC MAC protocols. The prime objective to prolong the network lifetime of the networks of this work is achieved successfully.

5. Conclusion and Future Work

This paper implements three multichannel based MAC protocols, namely MC, MEMC and MEMCC. This paper is an attempt to optimize the network performance with the increase in the number of sensors in a network. The probability of collisions is not of much significance for the smaller networks, but with the increase in the number of nodes it deteriorates the network performance. The proposed protocols have achieved the prime objective of optimizing the performance of WSN deployed to realize IoT for tourism successfully.

In the future, the intent is to further enhance the network performance by the development and implementation of efficient mechanisms.

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Reward-Based Crowdfunding Decision Model: Conceptual Framework

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Abstract

In the beginning of new start-up business, founders who need seed funding to support their prototype production normally has no experience and no valuable assets to pledge as collateral for their borrowing from financial institutions. Due to a risky nature of start-up business, reward-based crowdfunding mechanism plays an important role to assist early stage startups to raise their initial fund. Crowdfunding helps new business owners to fulfill their capital requirement through internet platform by funding on relatively small amount of money from a large number of individual contributors. The purpose of this study is to identify key success factors that drive the reward-based crowdfunding projects from empirical data collected from Kickstarter. In particular, our study looks into entrepreneurial, project, and campaign aspects of the data to characterize successful crowdfunding projects. As a future work, we propose a crowdfunding prediction model that employs machine learning approach to assess probability of success in fund raising.

Keywords

Crowdfunding, Reward-Based Crowdfunding, Investor's Decision, Entrepreneur

Introduction

In recent years, crowdfunding has become a valuable alternative source of financing for entrepreneurs to raise initial fund in the early stage of their business which face to risky circumstance in nature. New entrepreneurs are traditionally riskier and have a higher rate of failure in comparison with other businesses as there are uncertainty about the development of unproven products and services (Valanciene and Jegeleviciute, 2013). Crowdfunding refers to the efforts by entrepreneurial individuals and groups – cultural, social, and for-profit – to fund their ventures by drawing on relatively small contributions from

a relatively large number of individuals using the internet, without standard financial intermediaries (Mollick, 2014). Crowdfunding is an emerging approach for entrepreneurs to implement their ideas despite not having traditional monetary resources such as banks and venture capital. Through crowdfunding platforms, the crowd can invest in business ideas and projects, and entrepreneurs can raise funds via the Internet (Bi et. al., 2017).

The classification of crowdfunding has four types based on business stage, objective, return type and risk level as presents in Table 1 below:

Table 1: Crowdfunding Type

Crowdfunding Type	Donation	Reward (Pre-paid)	Loan (Peer to Peer)	Investment (Equity)
Business stage	Seed period		Start-up period	
Business objective	No business entity, entrepreneurs have only idea and intention to develop prototype or do for social / donation		Business just starts to incur income and need fund for production and marketing	
Return type	No return	Non-financial return	Financial return	
	for tax deductible or project satisfaction	Product or service from entrepreneur's production and fund raising	Interest	Dividend or capital gain (Return based on profit sharing or ownership)
Risk level	Low		High	Highest
	No return expectation or no financial return		Have a chance to loss partial amount of principal	Have a chance to loss all investment cost

Source: SEC, https://www.sec.or.th/TH/AboutUs/Documents/SME_crowdfunding.pdf (Assessed on 31 October 2018)

Donation and reward based-crowdfunding normally use in seed stage of business which business entity has not yet formally set up but entrepreneurs have an creative idea and intention to produce prototype or do for social or donation activities. The first and second type of crowdfunding have low risk level as donators in donation-based crowdfunding normally have no expectation on return and supporters in reward-based have no financial return from their contributions. In donation-based crowdfunding, donators give their money for this kind of crowdfunding without any expectation on return (Guan, 2016) [9]. However, donators in some country may receive tax deductible benefit from their donation or project satisfaction whereas supporters in reward-based crowdfunding receive a reward for backing a project. In a reward-based crowdfunding platform, creators offer non-financial rewards to backers for their contribution (Yu et. al., 2018) [17] and individuals who contribute their money into a project do not receive any financial incentives, returns, or repayment in the project in return for their funds (Bi et. al., 2017) [4]. Lending-based and equity-based crowdfunding adopt when business is set up and start its operation to generate revenue stream but still need additional fund to develop production or pay for market activities. Lending-based crowdfunding has high risk as funders may not receive all or partial of principal amount and interest on payment due date whereas equity-based crowdfunding has the highest risk among other crowdfunding types because investors may totally or partly lose their fund if share price dramatically drops. In

lending-based crowdfunding, funders lend their money to specific projects to earn a certain interest rate and there is high default risk as funders may disappear with the investing money (Guan, 2016) [9]. However, equity-based crowdfunding involves the founder exchanging an ownership interest in the firm in return for an investor's contribution. Investors are entitled to future dividends and a share in the proceeds if the company share is sold. Capital funding goals are typically higher and investors' contributions are also larger relative to other crowdfunding models (Beaulieu et. al., 2016) [1].

There are five advantages of crowdfunding as follow:

1. Entrepreneur has a low cost of fund (Belleflamme et. at., 2014) [2]. When business has no profit, there is no burden or commitment to repay return to contributors whereas the company has to pay interest and principal to its lenders or pay dividend to its equity holders.
2. After the completion of crowdfunding process, entrepreneurs do not lose the shareholding right to control of their business (Valanciene and Jegeleviciute, 2013) [16].
3. There is a short funding period requirement as campaign period in crowdfunding is just approximately of 2 to 3 months whereas venture capital funding process need funding period more than 3 months.

4. Crowdfunding can be viewed as marketing tool without marketing expense to serve as an indicator of whether or not there is a market for a new product or prototype before launching of real product (Mollick, 2014) [14] (Belleflamme et. al., 2015)[3]. Entrepreneurs can gauge the potential for a successful project of the business based on the public's response to the request for support (Valanciene and Jegeleviciute, 2013) [16]. In addition, this also helps entrepreneurs to communicate their prototype to the public.
5. Crowdfunding provides a good opportunity for successful projects to be funded easily by venture capital or big investors for additional larger fund in the future (Belleflamme et. al., 2015) [3].

However, there are three disadvantages of crowdfunding as below:

1. There is a huge investment risk from early stage projects which are highly uncertain for project completion (Valanciene and Jegeleviciute, 2013) [16].
2. Entrepreneurs seeking to crowdfund their business face the risk of their idea being stolen by funded investors or large corporations while entrepreneurs might lack knowledge to protect their ideas and business plans. (Valanciene and Jegeleviciute, 2013) [16].
3. Entrepreneurs who have no intention to do business may make a fraud after they got funding or use the fund on the wrong purpose from initial project's objective. Some businesses might even be created as fraud because some projects can be started in order to take funding, pay it all as salary and then shut down (Valanciene and Jegeleviciute, 2013) [16].

In the present study, we focus on reward-based crowdfunding, as it is the largest category of crowdfunding in terms of the overall number of crowdfunding platforms as well as the raised funding amount in the past years (Kunz et. al., 2017) [12]. This crowdfunding type represents both a large variety in the capital goals sought and a large variety of individual contribution amounts received (Beaulieu et. al., 2015) [1]. As a result, the purpose of this study is to identify key success factors that effect on the reward-based crowdfunding projects from empirical data collected from Kickstarter to provide insights to project creators to maximize their funding success.

Literature Review

A. Crowdfunding model and platform

In overall, crowdfunding can be categorized into four types (Belleflamme et. al., 2015) [3]: donation-based, reward-based, lending-based and equity-based crowdfunding. Donators make monetary donations without receiving compensation in donation-based crowdfunding. For reward-based crowdfunding, creators offer non-financial rewards in the forms of products or services to backers for their contribution (Zhou et. al., 2016) [18]. As for lending-based crowdfunding, lenders could receive their principal amount of money back including interests under certain conditions (Yu et. al., 2018) [17]. Instead of receiving non-financial rewards or interest, project initiators in equity-based crowdfunding could provide return in form of equity stake and profit sharing of residual income from their business to supporters (Mollick 2014) [14].

Funding in reward-based crowdfunding projects has grown rapidly in past decade. In 2014, the share of newly created platforms that are reward-based is approximately of 40%, followed by each around 20% in donation-based and lending-based platforms (Belleflamme et. al., 2015) [3]. The present study focuses on the reward-based crowdfunding as it is the largest crowdfunding type in terms of the overall number of crowdfunding platforms as well as the raised funding amount is the fastest growing form of crowdfunding. In addition, we can explore supporters' behavior and motivation for their decision making in reward-based crowdfunding as it natures is similar to the process of customers making purchase decisions.

There are two types of financing models in each crowdfunding platform which consist of "All-or-Nothing" model and "Keep-it-All" model. In the first model, project creators receive money only if the project has reached its funding target before deadline and receive nothing for failed projects. In contrast, the latter model gives founders the entire amount raised even for failed projects (Cumming et. al., 2014) [6]. It could be suggested that the crowd is more willing to give money in "All-or-Nothing" model (Yu et. al., 2018) [17] because it is less risky for supporters as projects that are not fully funded have less likelihood of completion.

On Kickstarter, reward-based crowdfunding platform, started to launch in April 2009, has an objective to help bring creative projects to life. Currently, it is one of

the world largest crowdfunding website, the number of projects had grown rapidly from 2009 to 2019 and the total amount raised had increased from 0.7 billion US dollars in June 2013 to 4.3 billion US dollars as at 20 May 2019. Funds raised on Kickstarter follows a rule called All-or-Nothing model which means no one will be charged for a pledge towards a project unless it reaches its funding target.

Kickstarter has attracted over 16 million backers to successfully fund 163,435 projects. The aggregated average success rate of Kickstarter campaigns was 43.7% in 2011, 43.6% in 2013 and 35.8% in May 2017 and 37% in May 2019. In Kickstarter platform, creators are people created the projects and seeking funding for their creative projects while backers are people who pledge money for projects they believe in. Pledges means monetary contributions from supporters towards the projects. Consequently, it is meaningful for both creators and backers to know the possibility of project success and outcome in advance which helps them to manage their work and future strategies to complete their whole funding process.

Currently, crowdfunding has become a competitive alternative in seeking financial support for entrepreneurs in funding creative projects but how to make a project being successful is not yet clear. Therefore, this present study is conducted with historical records of Kickstarter since it is not only the market-leading in reward-based crowdfunding platforms which make evaluation result reliable and trustworthy, but also contains sufficient amount of public information to utilize in our analysis and to explore the determinant factors that have an impact on the success of projects in funding from Kickstater campaigns.

B. Success factors in reward-based crowdfunding projects

From our literature review on the elements of the successful projects in reward-based crowd funding projects, the determinant factors could be categorized into three aspects which consisted of entrepreneurial, project and campaign aspect which we also provide the rationale for our research hypotheses in each independent variable as follows:

1) Entrepreneurial aspect

1.1) Number of created projects.

Entrepreneurs who have past experience in crowdfunding,

especially in successful experience, are more likely to success in their fund raising (Kim et. al., 2017) [10] because founders with larger crowdfunding experiences are highly likely to gain credibility, which lead to success in fundraising. A similar finding is also supported by Daoyuan (2016) [7] who found that the number of founders' created projects has a positive and significant effect on the performances of crowdfunding campaigns as the created projects experience also can be seen as the experience of crowdfunding and entrepreneurship which may increase the founders' knowledge. Creating more projects leads to a learning effect; which means that the founder gains skills of how to present the project best and how to be successful in the funding process. Therefore, the following hypothesis is derived:

H1.1: Number of created projects has a positive relationship to the funding success

1.2) Number of project backings of the project initiator.

It is important for project initiators to back a few projects before they start to create their own for two reasons. Firstly, previous project backings of initiator sends a signal to the crowd that a project initiator understands the dynamics of crowdfunding, believes in the idea of crowdfunding. Secondly, initiators can learn from their own experience as a backer because funding other projects will help them to understand which factors are relevant to generate trust for potential backers (Kunz et. al., 2016) [13]. According to Daoyuan (2016) [7], his finding showed that the reciprocity of project founders, measured by the number of backed projects, has a positive and significant effect on the project performance. Thus, a high involvement of project initiators in other crowdfunding campaigns signals a project initiator's expertise which may influence supporters' behavior (Kunz et. al., 2017) [12]. Therefore, the following hypothesis is derived:

H1.2: Number of project backings of the project initiator has a positive relationship to the funding success

1.3) Identity disclosure

Identity information can be revealed that identity disclosure (by showing the name and photo) strongly affects how supporters perceive trust. Similarly, in the crowdfunding context, a project with a clear identity of the founder would gain more credibility, which in turn leads to a higher potential to reach the fundraising goal (Kim et. al., 2017) [10]. Therefore, the following hypothesis is derived:

H1.3: Identity disclosure has a positive relationship to the funding success

1.4) Number of facebook friends of the project initiator

Finding from Mollick (2014) [14] indicated that the number of Facebook friends, an indicator for the scope of the personal network of the project initiator, can hint to the initiator's potential to generate support, mobilize collective actions, draw on resources from other members of the social network and build trust. Linking to a social network can help to enhance trustworthiness and benevolence (Kunz et. al., 2017) [12]. Consequently, social network of individuals seeking funding influences the success of entrepreneurial financing efforts which plays a role in determining the success of projects. Therefore, the following hypothesis is derived:

H1.4 Number of facebook friends has a positive relationship to the funding success

2) Project aspect

2.1) Number of images used on the campaign site

Supporters are more attracted by visual images which help them understand the projects better. Thus, it is important for creators to use images to communicate with the Kickstarter community and attract contributors. Consequently, a higher number of images are also positively associated with funding success (Zhou et. al., 2016) [18]. However, it is possible that an excessive use of images results in a cluttered campaign page and eventually leads to an unpleasant appeal or an interference with readability (Kunz et. al., 2017) [12]. In addition, the pictures included in the profile are quite complex, with many are actually of textual contexts instead of pure images and require more sophisticated techniques to process the pictures in order to reveal the real effect of picture (Daoyuan 2016) [7]. In this study, we believe that visually appealing images show an initiator's preparedness to offer a high quality reward. An increase in the number of images, a backer is better able to assess a project's main intention and functionalities, especially the rewards, enhances the probability of project success. Therefore, the following hypothesis is derived:

H2.1: Number of images used on the campaign site has a positive relationship to the funding success

2.2) Number of videos used on the campaign site

Project initiators who include videos into their description

are more likely to succeed because video signals quality as it communicates that the project initiator is confident to show the respective product (Mollick 2014) [14]. Project creators should try to provide more richness media, such as videos, to help potential backers to understand the project and encourage them to support campaign Daoyuan (2016) [7] Kunz et. al. (2016) [13]. In addition, Bi et. al., (2017) [4] and Kunz et. al. (2017) [12] findings also showed that the correlation between the video count and a funder's decision to invest is also positive and significant. The number of embedded videos may thus serve as a positive signal which may lead to increased probability of project success. Therefore, the following hypothesis is derived:

H2.2 Number of videos used on the campaign site has a positive relationship to the funding success

2.3) Number of released updates

It is of importance for project creators to communicate with pledgers and potential pledgers (Mullerleile & Joenssen, 2015) [15]. This communication could help to reduce information asymmetries between involved parties. Thus, projects with more updates have a higher likelihood of fundraising success by motivating investors to participate (Kim et. al., 2017) [10]. Mollick (2014) [14] and (Kunz et. al., 2016) [13] findings also demonstrated that signals of quality such as frequent updates are associated with greater success. In addition, Kunz et. al. (2017) [12] finding explained that updates can strengthen the relationship between the creators and the crowd, and hence lead to a higher degree of trustworthiness. Therefore, the following hypothesis is derived:

H2.3: Number of released updates has a positive relationship to the funding success

2.4) Number of entries for comments on the campaign site

Founders can also market their projects or update information by posting comments, this means that they have no need to focus on marketing their projects by using web tools, updating information, or designing the incentive plan when they frequently post comments (Kraus et. al., 2016) [11]. Therefore, it is important that the amount of generated comments holds indicates that a promising communication strategy must be in place for the project. The project must appear active and facilitate communication between backers in a visible forum, to be more successful (Müllerleile, & Joenssen, 2015) [15]. A similar finding is also supported by Kim et. al. (2017) [10]

who indicated that projects with more comments have a higher likelihood of success in fundraising because of the reduction of information asymmetry that an investor may confront. Consequently, the following hypothesis is derived:

H2.4: Number of entries for comments on the campaign site has a positive relationship to the funding success

2.5) Availability of a project home page

An external website can increase creators' options of communicating with the crowd. Having an external website may be perceived as a positive signal which may lead to increase probability of project success (Kunz et. al., 2017) [12]. Projects not featuring their own website or one on a social media platform have a substantially lower success probability (Müllerleile, & Joenssen, 2015) [15]. Therefore, the following hypothesis is derived:

H2.5: Availability of a project home page has a positive relationship to the funding success

2.6) Number of available reward levels

Founders can choose the number of reward levels which require amount of money backers need to pledge to receive a reward. A higher number of different rewards increases the likelihood of project success (Kunz et. al., 2016) [13]. It can further be viewed that the more different rewards a project offers, the more options a potential backer has to pick from which ultimately results in more financial support (Kunz et. al., 2017) [12]. Therefore, the following hypothesis is derived:

H2.6: Number of available reward levels has a positive relationship to the funding success

2.7) Length in description

The introduction word count of a reward-based crowdfunding project is a typical signal of project quality: the more detailed the introduction, the more readers will decide to invest because supporters will perceive this project as more reliable. (Bi et. al., 2017) [4]. In addition, formally written project descriptions may signal the preparedness and professionalism of project owners, thus increase the positive perception of backers and increase the likelihood of funding success (Zhou et. al., 2016) [18]. It is consistent with Kim et. al., (2017) [10] who indicated that elaborating a description refers to the act of adding key details in order to influence an investment decision. Therefore, the following hypothesis is derived:

H2.7: Description Elaborateness has a positive relationship to the funding success

3) Campaign Aspect

3.1) Campaign duration

A longer fund-raising period might expose an uncertain narrative for the project, resulting in decreasing support for the project (Frydrych et. al., 2014). According to Mollick (2014) [14], long campaign durations signal a lack of confidence of the project initiators to successfully raise money. Zhou et. al. (2016) [18] and Kunz et. al. (2017) [12] findings also demonstrated that a higher requirement of funding goal and a longer campaign duration are negatively associated with funding success. On the other hand, Cordova et. al., (2015) [5] finding reported that the duration of the project is associated to a higher probability of success because the longer in time the fundraising closure is, the higher the likelihood contributions will add up to an amount equal or above the one originally requested by the founder. In addition, Kim et. al. (2017) [10] indicated that there is a positive influence of duration from projects. However, we have assumption in this study that a long duration may reduce the backer's confidence in the project initiator's ability to complete the project in the provided time and quality. Therefore, the following hypothesis is derived:

H3.1: Campaign duration has a negative relationship to the funding success

3.2) Funding goal

Funding goals should be set realistically. Reducing the required funds makes achieving financing easier Müllerleile & Joenssen (2015) [15] because a high funding target implies more effort is required by the project creator to legitimate the requested funding Frydrych et. al. (2014) [8]. Cordova et. al. (2015) [5] also found that an increase in the amount requested, reduces the probability the founder will reach funding goal. In addition, Kim et. al. (2017) [10] finding demonstrated that setting a high funding goal indicates a large initial capital investment needed for a project, which is ultimately a signal of higher risk that can create distrust regarding the founder's ability to complete the project. Thus, funding goal has a negative impact on the successful campaign Kunz et. al. (2017) [12]. Therefore, the following hypothesis is derived:

H3.2: Funding goal has a negative relationship to the funding success

3.3) Delivery time of reward

In the context of online services, delivery time is seen as a critical signal of service quality. Short delivery times may serve as a signal that a product or a service is close to completion. It further serves as a quality signal that helps to reduce perceived risks and foster perceived trust, thereby influencing funding behavior Kunz et. al. (2017) [12]. By announcing delivery dates that are close to the end of a campaign, the project initiator signals his confidence and ability to get the rewards realized as promised and on time. In contrast, backers searching for new projects may rate a high delivery time as risky, and thus regard the initiator as not prepared enough to get his own project realized. Consequently, the increased delivery time may serve as a negative signal which may lead to a decreased probability of project success. Therefore, the following hypothesis is derived:

H3.3: Delivery time has a negative relationship to the funding success

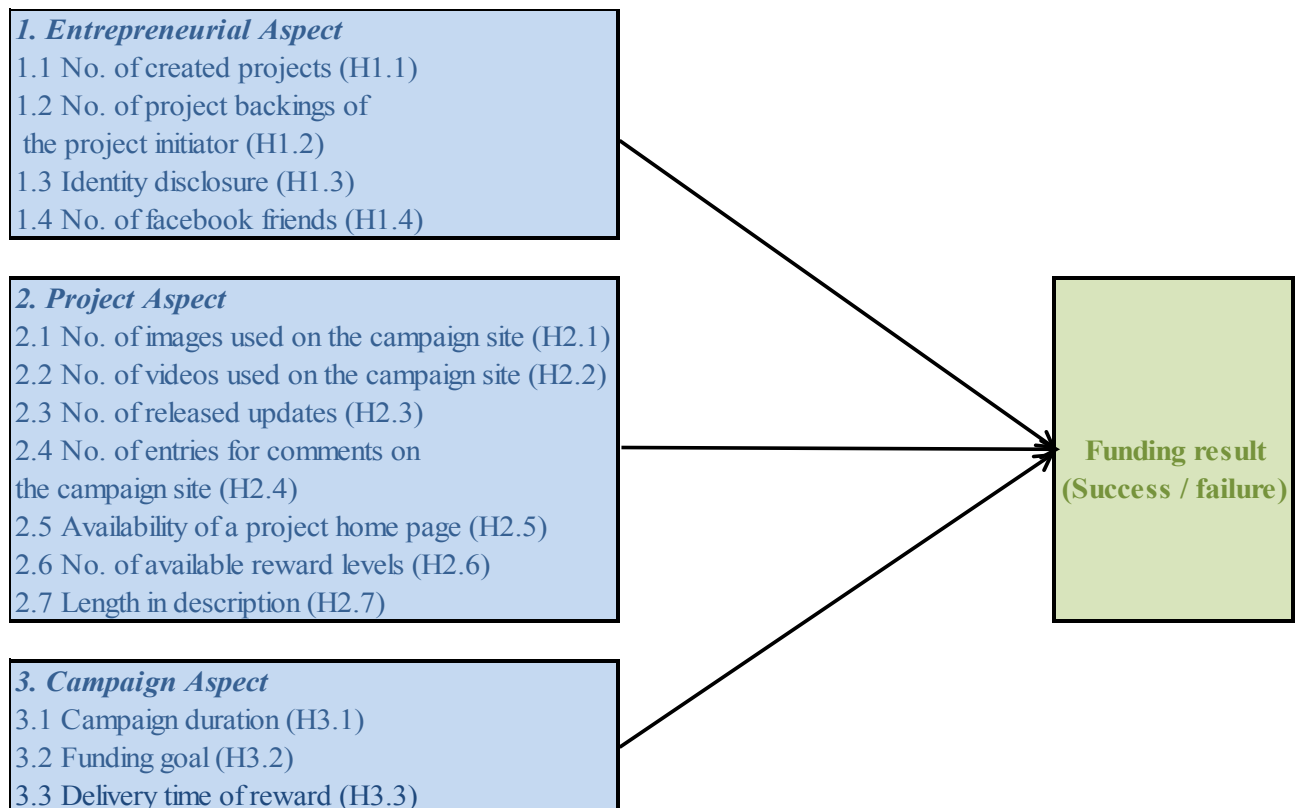
Research Framework

In this research, we examine the determinant factors that

effect on the success of project fund raising in reward-based crowdfunding which address into three aspects: (1) entrepreneurial aspect (2) project aspect and (3) campaign aspect. As already outlined within the previous literature review, the determinant factors can encompass the successful funding on the crowdfunding platform. This funding success is reached, when the amount of money pledged by contributors exceeds the determined funding goal.

From the previous research in literature review, we outline the impact factors included in our research model as well as their hypothesized effects on the success of funding. Therefore, we especially build upon previous research in the field of crowdfunding in order to investigate the effect of certain determinants in entrepreneurial, project and campaign aspect have an influence on the success of funding. Furthermore, we will develop a machine learning model that can assess probability of success in fund raising.

In this study, we propose several determinant variables on project success and provide the rationale for determinant factors in our conceptual framework as shown in Figure 1



Source: Author's design

Figure 1: Conceptual framework to explain determinant factors influence on project success in reward-based crowdfunding

In summary, we provide the overview analysis of crowdfunding mechanism and determinant factors that effect on reward-based crowdfunding campaign. Through a review of previous literature, we present our conceptual framework and divide successful features in reward-based crowdfunding campaign into three aspects: (1) entrepreneurial aspect (2) project aspect and (3) campaign aspect. The research samples are included successfully and unsuccessfully funded and selected from design, fashion and technology category from Kickstarter's available actual data. As a future work, we propose a crowdfunding prediction model that employs machine learning approach to discover the relationship between determinant factors and project success in fund raising. Finally, our finding contributes to knowledge accumulation in crowdfunding and gives practical guidance to help project creators to achieve project funding goal.

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An Efficient CIT-Based Reversible Image Watermarking Method

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Abstract

A reversible image watermarking scheme recovers the original image after extracting the embedded watermarks. A conventional CIT-based image watermarking method segments digital images to combination of non-overlapped blocks. Blocks of the original image is one-to-one mapped to blocks of the covered image for acquiring the watermarked image. The mapping table is needed for perfectly recovering the original image from the watermarked image. Quality of the watermarked image is determined by mapping procedure and the selection of mapping table. In this study, we examine different selection strategies to present an efficient method for acquiring good quality of the watermarked image. Analysis with other selected strategies, like random preprocessing or nearest matching, are compared. Moreover, color image has better watermarked image quality than gray-level image. For acquiring good watermarked image, nearest matching is the so-far best strategy on the CIT-based method. Experimental results show that the watermarked image has a similar visual effect to the target image but can perfect recover to the original image by using the mapping table.

Keywords

Class Index Table (CIT), random preprocessing, nearest matching

1. Introduction

Recently, data hiding is an important topic, especially on audio, video or image. Lots of Reversible Data Hiding (RDH) techniques have been reported in the past two decades. Among these schemes, they first generate PEs as the host sequence [5] and then reversibly embed the message into the host sequence by modifying its histogram with methods like histogram shifting. Most of these methods can also be viewed as a process of semantic lossless compression [6], in which some space is saved for embedding extra data.

In recent years, RDH in encrypted images (RDH-EI) encrypts the original image by content provider and the secret data is embedded by data hider with the data hider having no knowledge about the encrypted image.

Zhang [7] presented a RDH-EI scheme for by using 3 specific bit value on each pixels of a block. Hong et al. [8] then improved REH-EI by using better estimations and a side match technique. Chang et al. [9] used difference-

expansion technique to embed information into pairwise encrypted image. The main idea on RDH-EI [2, 4] is that receiver can obtain different contents with different access rights. If an unauthorized access happens, the content owner encrypts his personal images before store them. Inspired by the technique of image transformation proposed by Lee and Tsai [3], their method can transform the original image to a freely-selected target image with the same size, yielding a secret-fragment-visible mosaic image defined in [1]. However, the original image cannot be restored in a lossless way. Therefore, their scheme is not reversible.

Since the reversible data hiding technique studies perfect ways to recover original image after watermark extraction, this paper examines previous scheme to have a RDH-EI with better representation on watermarked image. By using different parameters assignment like random pre-processing and greedy block mapping [10], the watermarked image can be acquired and the original image can be perfectly recovery by using the corresponding CIT

tables. Moreover, the usage of the difference matrix and mapping table improve the execution performance.

The paper is organized as follows. Section 2 briefly reviews important related CIT encryption work [2]. Section 3 introduces our proposed scheme, including theoretical analysis in different parameters assignment. Section 4 demonstrates our experimental results. Section 5 follows with concluding remarks.

2. Background Review

This section briefly reviews Zhang et al.'s work [2] on CIT-based method. The CIT tables, adopted by transferring the semantic of the original image to the semantic of a target image. The original image can be perfectly recovery by using corresponding CIT tables.

A (m, n, k) CIT table denotes the k larger and smaller pixels in a block. Figure 1 shows a CIT encryption example of a pixels' image block with $k=3$.

8	7	2	1	1	1	0	0
6	3	5	4	1	0	0	0

(a)
(b)

Figure 1 – An example of an image block with its CIT table with $k = 3$.

The embedding process of using CIT table with k largest pixels selection on transferring a image block is illustrated as follows.

1. Find k largest pixels in original block and note their positions in 1 with the remaining positions in 0 to acquire original CIT table.
2. Find k largest pixels in target block and note their positions in 1 with the remaining positions in 0 for acquiring target CIT table.
3. Move these k largest pixels in original block in position 1 of target CIT table orderly and the remaining pixels in position 0 for acquiring the watermark block.
4. The original block can be recovered by using the watermark block and original CIT Table.

Figure 2 shows an example of embedding process using original block (a) and target CIT table (d) to acquire watermark block (e). Then, using watermark block (e) and original CIT table (b) can perfectly recover the original block (a). Moreover, CIT tables (b) and (d) can be directly

acquired from the corresponding blocks (a) and (c).

8	7	2	1	1	1	0	0
6	3	5	4	1	0	0	0

(a)
(b)

1	2	3	6	0	0	0	1
8	3	9	4	1	0	1	0

(c)
(d)

2	1	3	8
7	5	6	4

(e)

Figure 2 – Embedding process of using CIT tables of $t = 3$.

Assume that the original image O is segmented to n original blocks $\{o_p, o_l, \dots, o_{n-l}\}$ and the target image C is segmented to target blocks $\{c_p, c_l, \dots, c_{n-l}\}$, the block mapping step transfers the indexes of o_p to fit the order in c_q . Therefore, each pair (o_p, c_q) constitutes the mapping table T in the CIT-based method. The usage of CIT tables can be also taken as the index permutation of larger k and smaller pixels in a pixels' block.

Therefore, the embedding process requires the original block and the target CIT table. The recovery process can perfectly recover the original block by using the watermarked block and the original CIT table.

The embedding process is applied to all non-overlapped partitioned blocks extracted from the original image and the target image. Therefore, the size of the original image and the target image should be consistent. After partitioning the original image into non-overlapped blocks with size of pixels, the block numbers between the original image and the target will be paired match, in which denotes the size of the original and the target image.

This study mainly focuses on execution performance and the finding of mapping table T .

3. Proposed Scheme

This section shows the presented algorithm and comparisons under different selections in the proposed scheme. Section 3.1 shows the proposed algorithm. Section 3.2 compares different selection parameters of the propose scheme, especially on the computation complexity.

3.1 Proposed Algorithm

The embedding algorithm applies original image O into target image C to acquire watermarked image W . The recovery algorithm acquires the recovered image I_R from the watermarked image W , the mapping table T_m , and the original CIT tables T_c . Figure 3 shows the important steps of the proposed scheme.

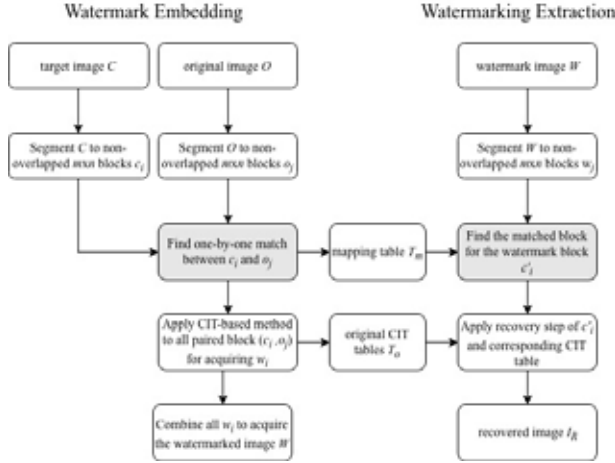


Figure 3 – Important steps of the proposed scheme.

Figure 4 shows the proposed algorithm, in which two inputs are original image O and target image C , three outputs are watermarked image W , mapping table T_m , and original CIT tables T_c . Parameters of block size mxn and threshold step t_s are also required.

Meanings of each step is introduced as follows. Step 1 segments two input images into non-overlapped mxn blocks. Step 2 calculates distance matrix D of two input images O and C . Step3 calculates mapping table T_m from above distance matrix D . Step4 acquires the watermarked image W by using CIT-based method, T_m , and blocks of two input images O and C . Moreover, the usages of D and T_m are adopted for improving the computational complexity of the proposed scheme.

3.2 Comparisons

This section compares different selection parameters in the proposed scheme. Two different strategies are introduced and compared. First, the random pre-processing is one selected parameter. The random pre-processing can be selected or not. Second, two major mapping methods are direct mapping and greedy mapping. The direct mapping method maps blocks between two images O and C orderly. The greedy mapping method matches blocks between O and C by choosing minimum distance first with greedy strategy.

Four analyses on Table 1 are discussed as follows.

1. Direct mapping is the fastest one because no pre-processing is needed. No mapping tables are needed in recovery.
2. Direct mapping with random pre-processing adopts XOR processing on random block and image blocks. The random block is needed in recovery processing.

Table 1 – Analysis on four different proposed methods

Method items	Direct mapping	Direct mapping with random pre-processing	Greedy mapping	Greedy mapping with random pre-processing
pre-processing	no	random XOR pre-processing	no	random XOR pre-processing
pre-processing computation	0	XOR calculation	addition multiplication comparison	XOR calculation addition multiplication comparison
recovery key	no	one integer	integers	integers
CIT table	bits	bits	bits	bits

3. Greedy mapping is the most important analysis in this study. During the computation process, the distance matrix D computation takes most of the processing time. Because the distance between any two blocks of one from the source image and the other from the target image, the Euclidean distance computation needs addition, in which d represents image color depth, is matrix elements in D . Because of the requirement of mapping table T_m used in watermark embedding algorithm, the same mapping table T_m is also needed in original image recovery.
4. Greedy mapping with random pre-processing adds random pre-processing before applying the greedy mapping algorithm.

Moreover, mapping table T_m can be represented by integers and total size of CIT tables equals to the image size.

4. Experimental Results

This section demonstrates experimental results of the proposed RDH-EI scheme. Figure 5 shows four 256×256 images as our test images including Airplane(gray), Baboon(gray), House(color), Pepper(color).

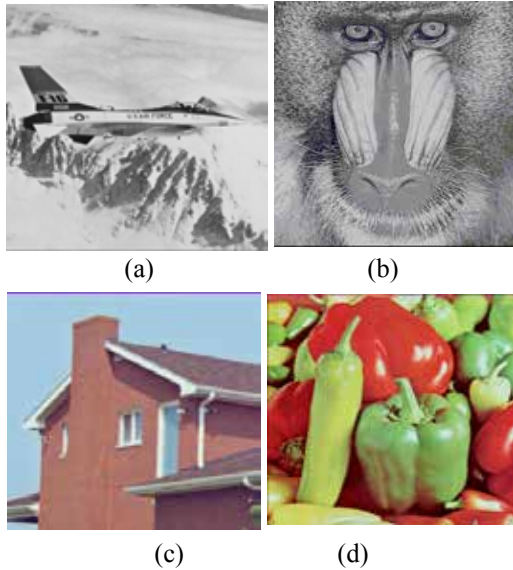


Figure 5 – Test image: (a) Airplane, (b) Baboon, (c) House, and (d) Pepper.

Table 2 – Parameters assignments in our experiments

	Random pre-processing	Mapping
(a)	No	Direct mapping
(b)	Yes	Direct mapping
(c)	No	Proposed mapping by block distance
(d)	Yes	Proposed mapping by block distance
(e)	No	Proposed mapping by distance of block mean and variance
(f)	Yes	Proposed mapping by distance of block mean and variance

Table 2 shows six different parameters assignment in our experiments. Figures 6-8 demonstrate the experimental results of different images under parameters used in Table 2.

Figure 6 shows the experimental results of original image being gray Airplane and target image being gray Baboon. Figures 6(a)-6(f) are results of using parameters Tables 2(a)-2(f), respectively.

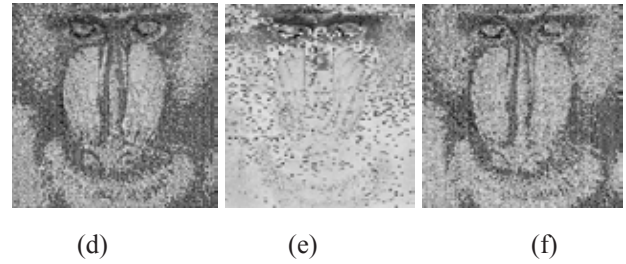
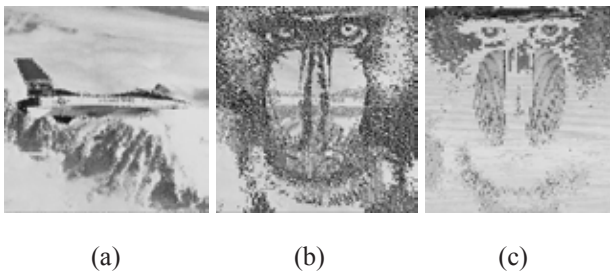


Figure 6 – Experimental results of original image: Airplane(gray) and target image: Baboon(gray).

Figure 7 shows the experimental results of original image being color House and target image being color Pepper. Figures 7(a)-7(f) are results of using parameters Tables 2(a)-2(f), respectively.

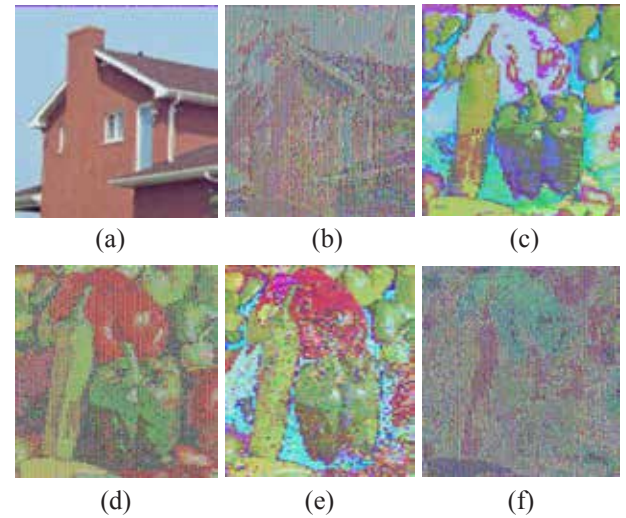


Figure 7 – Experimental results of original image: House(color) and target image: Pepper(color).

Figure 8 shows the experimental results of original image being color Pepper and target image being color House. Figures 8(a)-8(f) are results of using parameters Tables 2(a)-2(f), respectively.

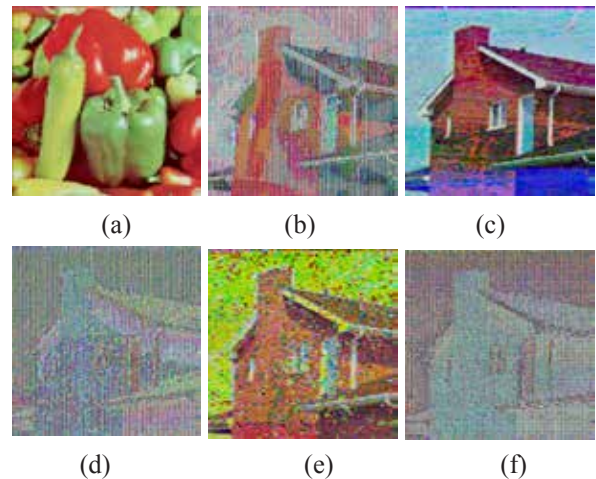


Figure 8 – Experimental results of original image: Pepper(color) and target image: House(color).

From Figures 6-8, we have the following conclusions of the CIT-based watermarking methods.

1. The direct mapping has the worst watermarked results like Figures 6-8(a). Direct mapping with random pre-processing has better results than without random pre-processing. But some significant information in original image can also be found in watermarked image.
2. Random pre-processing acquires better results according with noisy effect.
3. Experimental result show that proposed mapping by distance of block mean and variance, no random pre-processing like Figures 6-8 (e) have better quality. However, quality of the watermarked image is still not good enough.

5. Conclusion

This paper examines the scheme of using CIT for embedding images. Under our limited experiments, the experimental results show that using CIT's permutation strategy is hard to acquire good quality of watermarked image. Although different methods, including random pre-processing and various distance matrixes, are experimented, we still hard to find ideal results. Different distance matrixes worth our future study.

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The value of data analysis while doing Phd research in management

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Abstract

Doing research is not an easy job. There researcher has to identify many things which are not seen apparently through naked eyes but by the analysis of the data collected. Research is not copying the things from other sources and collecting data and tabulating them and expressing as it is. It is an endeavor to see the hidden aspects of a system, or objects. Everywhere there come the questions of validity and reliability of the information, tools and techniques. This research tries to develop deep insight upon data analysis aspects of Ph.D. research. The issue raised is to what extent a Ph.D. student should go in analyzing the data. Knowledge has no limitation; the depth of it cannot be measured easily and as predicted. How much it is required is not easy to answer; however this article tries to discuss this issue and develop some insight.

Keywords

Knowledge, sources of knowledge, knowledge through research

Introduction

One important saying is data never tells anything until they are not analyzed and interpreted. On the importance of data analysis in the research, Johnson (2011) [1] writes “data analysis is a process used to transform, remodel and revise certain information (data) with a view to reach to a certain conclusion for a given situation or problem”. Different tools and methods are developed in different fields to begin the discussion on certain points of data and to reach a certain conclusion. Researching without proper data analysis and reaching to a conclusion is underestimating the research. In the process of data analysis, data are filtered in such way that they give meaning to the researcher and help to develop insight. Proper analysis removes biases from the researcher to state about the things. Improper tools and faulty method practiced in the data analysis knowingly and unknowingly can bring many problems. This is why this article is written. Interpretation is the process of attaching meaning to the data. Interpretation requires fair and careful judgments.

Types of data and analysis

There are two types of data in the research work named qualitative data and quantitative data. Qualitative data means unquantifiable values assigned to objects which cannot be measured in number but can be described, whereas quantitative data is the value generated by

quantifying objects under study. Both the data have their own importance in research. The aim of the analysis of both differs. Sinaga (2014) [2] has differentiated them with their importance and limitation as displayed in Table 1. Marshall, and Rossman, (1999) has remarked it as complicated task by stating "Data analysis is the process of bringing order, structure and meaning to the mass of collected data. It is a messy, ambiguous, time-consuming, creative, and fascinating process. It does not proceed in a linear fashion; it is not neat. Qualitative data analysis is a search for general statements about relationships among categories of data"[11].

Table 1: Difference between qualitative and quantitative data

Method/ aims and limitation	Aims	Limitation
Qualitative	□ exploring the things unknowing and un expectedly □ Helps to gain deeper and deeper level of knowledge in a sequence □ Provides information which somehow can be converted to numerical form	□ Not possible to generalize □ Statistical tool are not applied □ -The quality of research depends upon researchers own ability rather than summarization of data.

Quantitative	☐ data and information source is large enough ☐ Possibility of expressing numerically is high ☐ Generalizability ☐ Statistical techniques are easily applied	☐ Difficult to measure new and untouched phenomenon and answer to the question “why”? ☐ Difficult to calculate through statistical process so hard to make other believe
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Source: Sinaga (2014)

Statement of the problem

The demand of research in every field is increasing. The trends of writing research papers, dissertation and research reports have been essential for the academic degrees to complete. When the research starts with objectives and research questions, then concurrently another issues arise, they are: what should be the methodology to be used to fulfill research objective, when research begins and ends, whether his/her findings will be trustworthy or not, whether his/her findings will be generalizable or not, For this the researcher tries to search the universally applicable methods of research. However, this has been debatable issues. There are many analytical tools about which researchers have no similar opinions. There lack similar prescriptions regarding use of data analysis tools. Recent developments of fast computer processors have made it possible that large number of data consisting with large number of variables can be analyzed with the help of computers.

Due to the fact that researcher do their research in their interesting topic, but the statistical and analytical tools are different which may not catch their interest. Without processing his/her data and validating them these cannot take the form of knowledge. New tools and methods are being added over existing methods and tools. Such information must be inculcated in the mind of researchers. Therefore, researcher need to develop insight how data are to be analyzed, what statistical tools and techniques are available, where these things are available, what are the advantage and limitation of each tools and techniques, etc.

Limited researches have been carried out in this direction. This is reflected in the reviewed literature which is summarized in literature review portion of this article. The research which summarizes the things in comprehensive way is found absent. So this research is conducted.

Objectives of the study

The objective of the study is to review data analysis tools and techniques of management research of quantitative data. Also it aims to investigate the value of different tools in analyzing data.

Research question

The researcher wants to know the available data analysis tools of management research for quantitative design. To what extent researchers are using different tools to analyze the data.

Limitation

This article focuses towards quantitative data analysis only.

Methodology

The methodology of this research is based on observation of some thesis of PhD level students available at Nepal and internet. Around 50 thesis of Ph.D of Nepal has been observed and reviewed to see what methods they applied. Along with the observation extensive review of literature have been done to gain insight to prepare this research articles.

Hypothesis

A number of the research hypotheses are made to prepare this article. They are:

H0: All management students doing Ph.D use same tools and techniques to analyze the data irrespective of their of institutions

H0: All Ph.D students of management use same data analysis tools irrespective to their particular subjects

H0: All Ph.D students of management concern themselves to test independent variables, mediating and dependent variables and they use the tools accordingly

Review of literature

Durcevic (2019) has written an article on “ Your Modern Business Guide to Data Analysis Methods and Techniques”. In his article he presented several steps to be used in data analysis. The Figure 1 displays these tools and techniques.



Figure 1: Top 10 Data Analysis Methods & Techniques; adopted from Durcevic (2019)

In his steps he has prescribed some important statistical analysis. These are: cluster analysis, cohort analysis, regression, factors a n neural networks. He emphasized to make data analysis methodology more functional and giving logical direction.

Cluster analysis

Cluster analysis helps bringing objects together based on their common elements. For instance it brings together the people who think similar, the people whose salary is similar, whose status is similar, who are of similar age, whose philosophy is similar, people living in similar climate, patents with similar symptoms, people with similar genes, etc. Gone were the days, when it used to be was very iterative and long process requiring many hours and days to do cluster analysis. These days, computer software have made these easy. These days cluster analysis helps sampling process by identifying the similarity in groups so small sample can be very helpful because it helps to make appropriateness in sampling process.

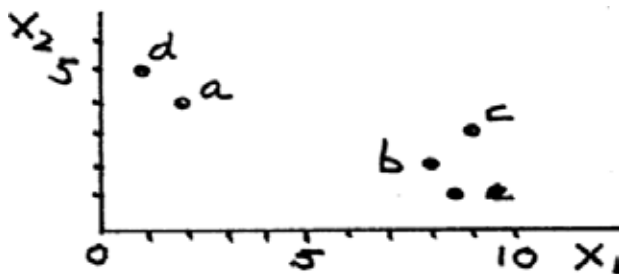
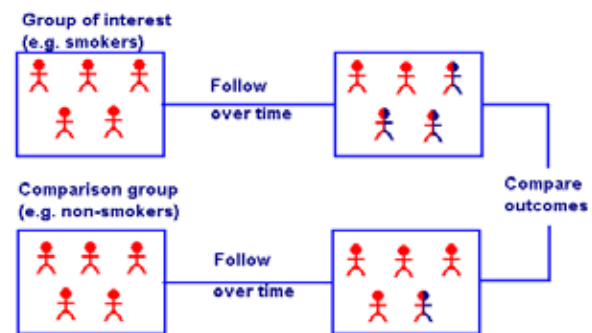


Figure 2: Grouping of observations

Cohort analysis

Cohort analysis is the analysis the researcher use to compare outcomes between two or more groups over a period of time. In health study smoker and nonsmokers are observed over a certain period of time and inferences are made whether smoking brings lung cancer or not.

Similar example can be whether the group of workers where receiving training gave higher productivity or not. This analysis is basically used by behavioral scientist. To measure the long term effect of advertisement the business analysts can use this.

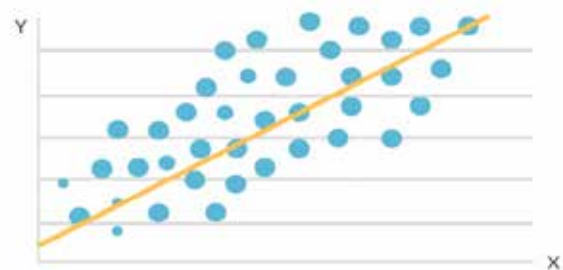


Source: <https://webengage.com/blog/cohort-analysis/>

Figure 3: comparing two groups through cohort analysis

Regression analysis

Regression analysis predicts the relation of one factor with others or relation of many factors to one. Often the researcher is encountered with the situation to know what factors contribute to the interest he/she has taken. Researcher makes conceptual framework to know the relation among different variables (independent and dependent variable). By Dependent variable, we mean the main factor that researcher is trying to understand or predict. And by Independent Variables we mean the factors that researcher hypothesize have an impact on your dependent variable.



Source: <https://www.surveygizmo.com/resources/blog/regression-analysis/> [4]

Figure 4: regression analysis to show how y is made of X

Regression is said to be most sensitive and powerful analytical tools for the study. There are different types of regression, which researcher must do according to data collected. ListenData(2019) have found 15 types of regression model. These are listed with the help of Table 2 below [5]

Table2: Types of regression

Name of regression	Functions
Linear Regression	It is a technique to show dependent and independent variable has linear relation.
Polynomial Regression	It is used when linear regression does not exactly fit. It is a technique to fit a nonlinear equation by taking polynomial functions of independent variable.
Logistic Regression	In logistic regression, the dependent variable is binary in nature (having two categories, like success or fail). Independent variables can be continuous or binary. In multinomial logistic regression, you can have more than two categories in your dependent variable.
Quantile Regression	When the data dispersed and some outliers are seen, then quantile regression is used. Quantile regression is the extension of linear regression and we generally use it when outliers, high skewedness and heteroscedasticity exist in the data.
Ridge Regression	Regularization helps to solve over fitting problem which implies model performing well on training data but performing poorly on validation (test) data. Regularization solves this problem by adding a penalty term to the objective function and controls the model complexity using that penalty term.
Lasso Regression	Lasso stands for Least Absolute Shrinkage and Selection Operator. It makes use of L1 regularization technique in the objective function.
Elastic Net Regression	Elastic Net regression is preferred over both ridge and lasso regression when one is dealing with highly correlated independent variables. It is a combination of both L1 regularization and L2
Principal Components Regression (PCR)	PCR is a regression technique which is widely used when you have many independent variables OR multicollinearity exists in your data. It is divided into 2 steps: Run regression analysis on principal components and Getting the Principal components The most common features of PCR are: Dimensionality Reduction, and removal of multicollinearity
Partial Least Squares (PLS) Regression	It is an alternative technique of principal component regression when you have independent variables highly correlated. It is also useful when there are a large number of independent variables.

Support vector Regression	Support vector regression can solve both linear and non-linear models. SVM uses non-linear kernel functions (such as polynomial) to find the optimal solution for non-linear models.
Ordinal Regression	Ordinal Regression is used to predict ranked values . In simple words, this type of regression is suitable when dependent variable is ordinal in nature. Example of ordinal variables - Survey responses (1 to 6 scale), patient reaction to drug dose (none, mild, severe).
Poisson Regression	Poisson regression is used when dependent variable has count data. The dependent variable must meet the following conditions. The dependent variable has a Poisson distribution. Counts cannot be negative. This method is not suitable on non-whole numbers.
Negative Binomial Regression	Like Poisson Regression, it also deals with count data. The question arises "how it is different from poisson regression". The answer is negative binomial regression does not assume distribution of count having variance equal to its mean. While poisson regression assumes the variance equal to its mean.
Quasi Poisson Regression	It is an alternative to negative binomial regression. It can also be used for overdispersed count data. Both the algorithms give similar results; there are differences in estimating the effects of covariates. The variance of a quasi-Poisson model is a linear function of the mean while the variance of a negative binomial model is a quadratic function of the mean
Cox Regression	Cox Regression is suitable for time-to-event data. See the examples below Cox Regression are suitable for time-to-event data. See the examples below - Time from customer opened the account until attrition. Time after cancer treatment until death. Time from first heart attack to the second.
Tobit Regression	It is used to estimate linear relationships between variables when censoring exists in the dependent variable. Censoring means when we observe independent variable for all observations, but we only know the true value of dependent variable for a restricted range of observations. Values of dependent in a certain range are reported as a single value. Detailed explanation of censoring is given below -

Source: ListenData(2019)

Factor analysis

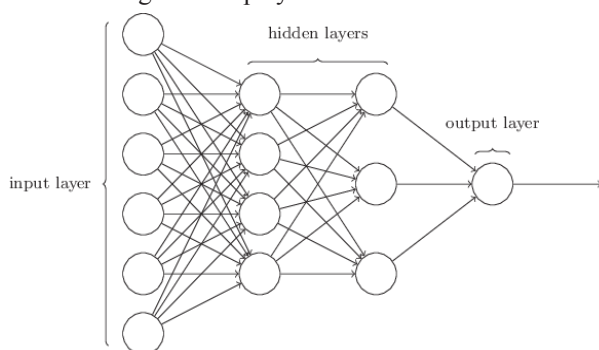
One of the most widely used tools that in data analysis assuming that observed variables collected have many or single unobserved variables called ‘factors’. This analysis uncovers independent latent variables. This is explained by correlating two observed variables and making assumptions that there is something in them common so they are correlated, this common latent unobserved thing is the factor. For instance, students with highest marks in science also secure higher marks in mathematics, because there is common things say “numerical intelligence” which is called a factor. To make a variable there can be a number of unobserved variable, the contribution of each unobserved variable is known as factor loading.

Structural equation

This is analyzing techniques that work the function of linear regression and factor analysis. It is said a multivariate statistical analysis technique because many variables are analyzed with the help of statistical software. Statistics Solution (2019) states that this technique as the join of factor analysis and multiple regression analysis [6]. It is used to analyze the structural relationship between observed variables and unobserved variables.

Neural network

Business problems and solutions are analyzed with the help of multilayer diagram composed of layers of computational units called neurons. Neural networks are used for solving many business problems such as sales forecasting, customer research, data validation, and risk management. Often advanced level research students use this picture to understand the complex business problems translating them into the neurons of different layers, like input layers, hidden layers as process and output layers as result. The figure 5 displays this.



Source: Shaha(2017) [7].

Figure 5: Neurons networks showing how input transforms output.

Conjoint analysis

Sawtooth Technologies, Inc. (2019) in its “Know Your Market) has written about it. The analysis helps the analysts to find the preference of employees or customers from the possibility of many products or services having many attribute [8].

Analysis of Variance (ANOVA)

Lane [9] writes about ANOVA that it is tool to compare the mean between two or more group mean. It only states the significance differences in the mean due to groups but does not state which group has higher mean so we have to depend on The "Honestly Significantly Different" (HSD) test developed by the statistician John Tukey to test all pairwise comparisons among means.

Test of Mean (t-test)

This analysis is done for comparing means in many different experimental situations.

Chi square test

This is common tests using the Chi Square distribution. It tests the deviations of differences between theoretically expected and observed frequencies (one-way tables) and the relationship between categorical variables (contingency tables).

Important methods of data analysis

Dillard () in his article “5 Most Important Methods For Statistical Data Analysis” has suggested mean, standard deviation, regression, sample size determination, hypotheses testing [10] .

Result and discussion

In order to analyze what tools the researches use to analyze data and come to the conclusion. Fifty thesis of Ph.D levels conducted in2017 and 2018 of Nepal and outside the Nepal were studied. The Table 1 gives the description on it. My objective to review the thesis was to data analysis process of those thesis was to compare the data analysis practices of cross country settings of advanced and developed country and developing country. the reasons for choosing Nepal, India, UK and USA is to find language English because researcher will find difficulty in understanding. The selection of thesis for the study was convenience types. upon analysis of the thesis there is found four levels of analysis. In Ph.D the analysis begins with simple information in a tabular form like

respondents profile. In the next step it goes to describing the variables used and respondent's responses on it relating to research questions and objectives. It further goes to advanced level to analyze minutely upon every responses and their relation with the respondents. The last step is relating variables of different kinds basically independent, intervening, and dependent variable. All these become parts of analysis and interpretation. The Table 3 summarizes the empirical findings of data analysis on PhD thesis of 50 people of different countries: Western advance country and eastern developing country. All these observed dissertations of PH.D are not found to complete these all processes.

Table 3: Summary of data analysis tools and information sought in Ph.D Thesis of management stream

Country/ tools used	Data analysis tools used	
	T test/ ANOVA/ simple frequency table graph, charts [Common analytical tools, mostly descriptive]	Advance tools like multiple regression and SEM and factor analysis[advanced analysis tools and inferential statistics]
Nepal (10)	10[100%]	5[50%]
India (15)	15[100%]	4[27%]
USA, and England(25)	25 (100%)	13[52%]
Total	50(50%)	22(44%)

Source: Field survey

Data analysis tools are needed to analyze the data in the research. Which tools are needed depends upon objectives of the research. it cannot be concluded that not using the advanced tools and techniques mean the research work is poor. For instance in the experimental method simple t test works for the best, it does not mean that the thesis is poor. But appropriate tools for data analysis are always desirable. The table is based for data analysis of thesis works based on quantitative approach only. When the research is done applying qualitative approach then no such statistical tools mentioned above are used. One cannot judge about the quality of research works.

Conclusion

It can be concluded that researchers use only the tools prescribed while analyzing data. For instance, simple linear regression will not be the valid tools when the data bend, then poly nominal is desirable. Wrong tools used will lead to inappropriate findings.

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Recruitment and Selection Practices: The Case of the Five Star Hotels of Nepal

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Abstract

Employees are the major factors for growth and success of Hotel Industry. Recruitment and selection is the most important stage in generating efficient and productive manpower in the organizations. This study examines the current trends in the implementation of recruitment and selection practices in Nepalese Five Star Hotels. A quantitative online survey approach is used for the study. The study concludes that hotel industry in Nepal, in the case five star hotels, are still using traditional and costly approach in recruitment and selection methods. It is also known that almost every hotel have similar pattern of recruitment and selection process and the most top priority is given to interview and reference voice in final selection of the employees.

Keywords

Recruitment and Selection, management Practices, Hotel Industry, Five Star Hotels.

Introduction

Nowadays, every organization necessitates personnel planning as one of the most vital activities. Human Resource Planning is, by far, an essential ingredient for the success of any organization in the long run. Every organization that guarantees that it possesses the right number and type of people, at the right time and right place, so as to enable the organization to achieve its planned objectives. Commonly, the objectives of Human Resource Planning department include resource, planning, recruitment and selection, career planning, training and development, promotions, risk management, performance appraisal, to name a few. Each of these objectives requires special attention and accurate planning and execution. It is of utmost importance for every organization to employ a right person on a right position and recruitment and selection plays a pivotal role during such situations. With shortage of skills and the rapid spread of new technology exerting considerable pressure on how employers perform recruitment and selection activities. The internet has been a boon to the H.R. as it has made recruitment possible at a click of a button. The internet has changed the perspective

of recruitment function from the organization and job seekers perspective and also has improved the speed at which recruitment takes place. The internet, which reaches a large number of people and can get immediate feedback has become the major source of potential job candidates and well known as online recruitment. Online recruitment, is the practice of using technology and in particular Web-based resources for tasks involved with finding, attracting, assessing, interviewing and hiring new personnel.

In the present era, organizations are faced with the need to reduce costs, while at the same time sustain their productivity, in order to gain the edge in competing with major competitors (Mahapatro, 2010). For this reason, the issue of employee recruitment and selection is regarded as one of the key factors affecting organizations. The same situation applies to hotel establishments within the tourism industry. The recruitment and selection process of labour for such establishments is crucial for several reasons: the increasingly intense competition among hotel establishments; customers' changing expectations, needs and desires; the nature of an industry that is dependent on

an extensive labour supply; and the globalization process which has given rise to a mobile cross-border workforce, leading to the issue of diversity management (Bae & Rowley, 2001; Erdem, 2016; Festing & Eidems, 2011; Magoshi & Chang, 2009; Nickson, 2007; Valkonen et al., 2013; Welch, 1994).

The aims of this study is to investigate the employee recruitment and selection process of five star hotel establishments; and to understand the mechanism involved and the application process of human resources in both hotel establishments, regarding employee recruitment and selection, from a comparative analysis perspective.

Problem Statement

A big problem that is currently prevailing in the hospitality industry is the high turnover rate. This is due to the fact that staff working for leisure programs and hotels etc. usually face odd schedule issues and also the fact that workers in this field are paid low, which makes them quit sooner. And with a high turnover rate recruitment itself becomes a huge problem in this industry. And even if one does, finding the candidates with the best skills and professionalism is a challenge.

This problem has its roots in the fact that recruiters generally lack to make a correct pre-job assessment case which increases the risk of hiring a wrong person. This particular challenge in the recruitment within the hospitality industry is there because all the candidates try to present their best selves in an assessment which might blur their real personality in front of a recruiter. But not every organization feels the importance to create human resource department yet in them and are less focused towards the employees and to make them satisfied them towards the organizational HR practices. So, the study will investigate the recruitment and selection practices that lead to the Nepalese hospitality sector growth.

Research Objectives

The primary objective of this study is to identify the recruitment and selection practices of the five star hotels. The secondary objective of this study is to identify the criteria for the recruitment and selection process in five star Hotel. The specific objectives of this research are as follows:

- To find out the recruitment and selection practices in the five star hotels
- To identify and determine the challenge and trend of the selection process in five star hotel.

- To investigate the use of knowledge management system in recruitment and selection practices.

Research Methodology

A research design is plan structure and strategy to obtain the objective of the study. The research design used in this study is both descriptive and analytical. The research design is based on the regression, mean; standard deviation to evaluate the positive relation between dependent and independent variable for this study. The study used primary as well as secondary data. Primary data includes: questionnaire, organizational survey and observation. Similarly, secondary data includes: literatures, reports, business magazines, news and article.

Sample Size and Population

The population of the research can be included to the situations of the whole country. To represent the whole population, purposive sampling is carried out among the major sectors identified in the country. After the identification, procedural researches will be carrying out to derive the required outcome from each of them. The close ended questionnaire was provided in the English language to the respondent

Results

Table 1: Respondents Profile

	Category	Frequency
Gender	Male	76
	Female	29
	Total	105
Age	Below 20	12
	21-30	45
	31-40	38
	41 and above	10
Education	High School	38
	Bachelors	35
	Masters	22
	Others	10
Income	Less than 15000	21
	16000-30000	36
	31000-45000	32
	46000-60000	13
	61000 and above	3
Experience	Less than 1 year	20
	1-5 years	37
	5-10 years	31
	Above 10 years	17

Out of the total 105 respondent majority (75.2 percent, frequency 79) of the respondent are male followed by (24.7 percent, frequency 29) of the respondents are female. Similarly, majority (42.8 percent, frequency 45) of the respondent are 21-30 years followed by (36.0 percent, frequency 38) of the respondents are “between” 31-40. Out of the total 105 respondent majority (36 percent, frequency 38) of the respondent are of higher school followed by (33.3 percent, frequency 27) of the respondents are of bachelor level, (21.0 percent, frequency 22) of the respondents are of Masters level, (9.5 percent, frequency 10) of the respondents are of others. Out of the total 105 respondent majority (35.23 percent, frequency 37) of the respondent are of 1-5 year, followed by (30 percent, frequency 31) of the respondents are of 5-10 years, (15 percent, frequency 17) of the respondents are above 10 year.

Descriptive analysis

Experience, Attitude, knowledge and information system as a variables are studied to know the practices of recruitment and selection.

Table 2: Opinion regarding experiences

Experience	N	Mean	S.D.
Experience is main priority in the time of promotion	105	3.35	.689
Experience is given priority in selection and requirement process	105	2.86	.466
Experience identify skill behavior and knowledge	105	3.02	.808
The position of your work depend on your knowledge and experience	105	1.29	.668

Most of the respondents marked that experience is given priority in selection and requirement process. Experience helps to identify the skill behavior and depth knowledge in the employee. During the recruitment and selection process experience is given more priority. A lower rating is 1.29 the position of your work depend on your knowledge and experience. And the higher value of the respondent is 3.35 for experience used in promotion.

Table 3: Opinion regarding attitude

Attitude	N	Mean	S.D.
Positive attitude towards the job is most priority	105	3.15	.789
Positive attitude is more satisfactory	105	1.86	.496
A Positive attitude is a mindset that helps you see and recognize opportunities	105	3.82	.818
Attitude concerns on the positive side of recruiting	105	2.32	1.68

Organization see attitude of an individual as the major component of the recruitment and selection process as well. A positive mindset help to see and recognize the opportunities which the majority of the respondent agree (3.82) but respondents do not see that positive attitude is always satisfactory.

Table 3: Opinion regarding knowledge

Knowledge	N	Mean	S.D.
Knowledge shows the capability of applicants	105	2.15	.989
Technical knowledge are more preferable	105	3.86	.786
Technical knowledge helps in promotion	105	3.65	.782
Applicants having skill and knowledge are more acceptable	105	4.32	.688

Respondents agree that technical knowledge are more preferable (3.86) in the hotel industry and these technical skills in promotion (3.65). But the respondents do not agree that knowledge shows the capability of the applicants (2.15). Applicants having both skills and knowledge are more acceptable in the hotel industry (4.32).

Table 3: Opinion regarding information system

Information System	N	Mean	S.D.
Organizational information system is used for searching potential candidates	105	2.55	.789
Applicants background information is checked through knowledge management system	105	3.66	.665
Information system is beneficial in creating a pool of candidates	105	4.15	.425
Advance information management system is used for recruitment and selection process	105	2.32	.988

Nepalese hotel industry is not using the information system for searching the potential candidates (2.55) but respondents agree (4.15) that information system is beneficial in creating a pool of candidates. Applicants' background information is checked through knowledge management system. Respondents do not agree (2.32) that hotel industry is using advance information management system is using for the recruitment and selection process.

Conclusion

This study is based on primary source of data which has been collected through a well examined questionnaire from 105 respondents and interview. The primary source of data has been used to assess the opinion of respondents with respect to recruitment and selection process and practices in Nepalese Hotel Industry. The questionnaire survey has been conducted to know the opinion of employees towards the selection practices based on knowledge, skills, attitude and information system. The questions were designed to get the views of related information from the respondents. Findings from the current study are important to both employees and employers in terms of a deeper understanding of recruitment and selection practices and its effects on employee competency, which consequently affects organizations' productivity and performance.

Based on the analysis of data, the major findings of the study from 105 respondents are summarized as follows:

- Most of the respondents marked that experience is given priority in selection and requirement process. Experience helps to identify the skill behavior and depth knowledge in the employee.

- Organization see attitude of an individual as the major component of the recruitment and selection process as well.
- A positive mindset help to see and recognize the opportunities which the majority of the respondent agree (3.82).
- Respondents agree that technical knowledge are more preferable (3.86) in the hotel industry and these technical skills in promotion (3.65). But the respondents do not agree that knowledge shows the capability of the applicants (2.15).
- Applicants having both skills and knowledge are more acceptable in the hotel industry (4.32).
- Nepalese hotel industry is not using the information system for searching the potential candidates (2.55) but respondents agree (4.15) that information system is beneficial in creating a pool of candidates.
- Applicants' background information is checked through knowledge management system. Respondents do not agree (2.32) that hotel industry is using advance information management system is using for the recruitment and selection process.

This study makes contributions to employee recruitment and selection at Nepalese Hotel Industries. The study identified the existence of recruitment and selection practices, the priority given in the selection of the candidates and the major determinants in selecting the candidate from the pool. It was found that less priority given to knowledge as compared to the technical skills and attitude. Information system is not well developed to handle the recruitment and selection process. Mostly traditional approach is used which is costly. Traditional pattern of recruitment and selection is used from application submission, written test, interview, background check and final selection.

Suggestions and Recommendations

It was recognized that hotel industry can improve recruitment and selection process by implementing or improving in things information system like automated selection of candidates based on job criteria through information system. Final round interview can be more effective and cost saving and remaining preliminary parts should be made automated in the information system. It would help in eliminating biases, nepotism and favoritism that can lead to higher work performance, increase in

productivity, development of Hotel Industry in Nepal, quality service and that can again lead to the development of country economy.

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Tax evasion and its effects on taxation revenue and economic growth in Nepal

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Abstract

The tax collection and areas on its evasion has been the most prominent issue to be discussed over the last couple of years. The article concentrates and analyses on the tax evasion, total tax revenue and economic growth in Nepal. This study adopts both primary and secondary data. Relevant statistical tools will be used to analyze the data.

Keyword

Taxation, tax burden, tax reduction, tax evasion, tax avoidance, taxation revenue, economic Growth.

1. Introduction

The development of taxation was and is for the civilized society because there are some main reasons for its imposition: (a) raise revenue, (b) re-pricing of the goods and services, (c) redistribution of wealth and Income, (d) representation and reformation of the economy. To attempt and perform the stated purposes and the functions of government, the various scholars of public finance discovered the theories and principles of the taxation. As per its principles, a government imposes tax to perform the two major functions: one is protective (to protect life, liberty, and property of the citizens etc) and other is affirmative (to foster moral, ideological, or utilitarian goals etc) functions in the states without direct quid pro quo. However, the theories and principles of taxation are violated by both tax administrator and Tax payers originating the two most popular evils: tax evasion and avoidance. These evils are not new innovations.

Practically, there are three tax reduction techniques:

- Tax evasion,
- Tax avoidance and
- Tax planning.

The Tax evasion and tax avoidance techniques are the evils of the tax system. Burg (2004) stated that tax evasion is an unlawful method of tax reduction to be paid and such practice of the evasion was emerged in the Han Dynasty of China while the tax avoidance came into the economy from the second half of the fourth century.

Tax Experts and Scholars believe that there is a significantly difference between the tax evasion and avoidance, but both are illegal and unethical in most of the countries. For example, McCann (2006) argued, "Evasion of tax is a crime in most countries because it amounts to defrauding the exchequer of money that is rightly due to it. Avoiding tax means using whatever strategies are available to ensure that one pays no more tax than the law requires" (p. 86). Sharma and Dang (2011) opined that the difference between tax evasion and tax avoidance is as thick as a prison wall. But, tax avoidance is legal in some countries; for example, it is legal in India, but illegal in most of the other countries in the world. Some leading scholars and experts believe that the tax avoidance is also a crime. For example, Xuereb (2015) asserted that the tax avoidance refers reduction of tax liability by planning the affairs to bring the least tax possible all while acting within the provisions of the Acts. It is illegal as it minimizes the tax to be paid by utilizing the existing loopholes of the provisions of the Acts.

As stated above, Out of the three techniques of tax reduction, the tax evasion is illegal and unethical entire in the world; the tax avoidance is illegal in various countries. In the context of Nepal, tax evasion and avoidance both techniques are illegal only tax planning is legal to minimize the tax liability as tax law. Basically, these activities significantly differ from each other in practice.

Tax Experts and Scholars suggest that both tax evasion and avoidance are harmful in all respects to the prosperity of the government and economic growth of a nation.

Therefore, tax evasion and avoidance are two evils for the entire human civilization. In other words, tax evasion is both illegal and unethical, not only does it decrease government revenue, but also hinders the overall development. It is an act of concealing taxes, through the submission of false documents, false statements. According to the Income Tax Act 2000 of Nepal, tax evasion is punishable by charging a penalty.

Still, in spite of the penalty, Practice of tax evasion is increasing in Nepal. Thus, we tried to inquire the degree of relationship between the tax evasion and the total tax revenue and the economic growth in Nepal in this Article.

1.1. Problems

Taxation is a primary tool to raise the revenue as required by the government to fund its public spending. However, there is an insufficient tax to GDP ratio in Nepal. Because of this, Nepal and other developing countries face shortage of resources to fund even the necessary activities. The experts of public finance believe that the reduction of the tax evasion and its success depends upon the cooperation to each other between the tax administrator/tax official and taxpayers. Nepal, being one of the least developed countries in the world itself, is not an exception in this respect. For example, Nepali Times (2002) claimed that the then Joint Secretary of the Revenue Department of the Finance Ministry of Nepal, Bhoj Raj Ghimire told, "Tax evasion is a part of Nepalese culture". Therefore, almost taxpayers culturally practiced to pay minimum taxes. In addition, TeliaSonera (non-resident Telecommunication Company) sold its entire shares to Axiata without paying capital gains tax to the Government of Nepal, evading about 33 billion rupees of tax.

The World Bank (2018) reported that Nepal ranks at 110 on the doing business comparison report in 2018. It ranked 107 in 2017 and ranked 99 in 2016. The report claims, "The main reasons behind the drop are a decline in Nepal's business, regulatory environment and data revisions". Even so, the ranking of Nepal remained second after Bhutan and before Sri Lanka.

Nepal has been ranked 124th out 180 countries ranked in Corruption Perception Index (CPI)-2018 against 122th out of 180 countries ranked in CPI-2017 against 131th out of 176 countries ranked in CPI-2016,,according to an annual ranking of the Transparency International released here in Kathmandu.

The Kathmandu Post (2017) and Trading Economics (2017) reported that, as per the corruption perception index of Transparency International, Nepal ranked 131 corrupted out of 175 countries in 2016.

The mentioned facts prove that the status of the tax evasion in Nepal is in the significant amount because tax evasion exists pervasively. Thus, we tried to find out status of the tax evasion and, its relationship, and effect on the total tax revenue and economic growth in Nepal.

1.2. Objectives

The primary objective of this study is to inquire the association and influence between on the research variables (i.e., tax evasion, total tax revenue generation and economic growth). The secondary objectives are to examine the association between the variables, and to evaluate the influence of tax evasion on total tax revenue and economic growth in Nepal.

1.3. Research hypothesis

As to the objectives and research questions, we tested the following hypotheses:

H0: There is no significant association between tax evasion, total tax revenue and economic growth in Nepal.

H0: There is no significant influence of tax evasion on total tax revenue and economic growth in Nepal.

1.4. Significance and Limitation of study

We claimed that this empirical study on the inquiry on the tax evasion is useful for the policymakers, government officials, scholars, researchers, university teachers, students, examiners, examinees and other persons who desire to know about taxation in Nepal. However, it includes some limitations:

- (a) It was written within the short time frame,
- (b) It covers the tax evasion data, total tax revenue and GDP for the duration 10 years (since FY 2007-08 to 2016-17), and it excludes the tax evasion revenue raised by the Commission for the Investigation of Abuse of Authority.
- (c) It only includes the tax evasion data from income tax and VAT,

The reliability of data of the tax evasion depends on the annual reports of the Inland Revenue Department (IRD).

2. Literature review

This section of the study is a succinct version of the previous research and studied; and highlighted a description, summary and evaluation of each source of review. Therefore, we analyzed and presented the literature about the tax evasion, including other influencing factors like psychology, structuring the tax system, structuring statement by the taxpayers, non-compliance rate and bribery.

Table 1 Summary of the previous studies

Source	Findings, Conclusion and Recommendation
Friedland, Maital, and Rutenberg (1978)	A large amount of fine and high tax rate stimulate the tax evasion and consequently taxpayers underreport their income.
Hasseldine and Bebbington (1991)	The government should consider economic and psychological aspects to reduce the tax evasion.
Simser (2008)	The change in tax structure cannot eliminate the avoidance and evasion. The expansion of the tax base reduces the tax evasion.
Haloush (2008)	Complicated income tax law, changing constantly and ineffective government operations enhance tax evasion. The simple tax law and use to a variety of non-legal techniques controls the tax evasion.
Uadiale, Fagbemi and Ogunleye (2010)	There is a positive relationship between personal income tax rates and tax evasion in Nigeria.
Tabandeh, Jusoh, Nor, and Zaidi (2012)	There is a positive relationship between the tax evasion, the tax burdens, the size of governments and inflation, while negative relationship between the taxpayers' income and trade openness with tax evasion
Bekoe (2012)	The tax evasion is the single most important factor that holds the economic growth back.
Dalu, Maposa, Pabwaungana and Dalu (2012)	Loopholes in the tax administration system, corruption and bribery of the tax officials through tax agent are the major problems.
Adebisi and Gbegi (2013)	There is a positive relationship between tax avoidance, tax evasion and tax rates on personal income tax in Nigeria.

Xuereb (2015)	Tax net increases the tax evasion and government needs to expand the tax net.
Bethencourt and Kunze (2016)	A higher tax rate increases aggregate evasion and the number of evaders in the economy.
Gillman and Kejak (n.d.)	The tax evasion decreases both tax revenue and economic growth.
Bird(2015)	need for strong legal system, clear communication and stable law in order to reduce the tax evasion
Jit Bahadur K.C.(2018)	Reduction of tax evasion is possible the strong legal system.

Sources are compilation of Author

The survey of literature showed that the tax evasion hinders the tax revenues, economic growth and creates instability in the society. The study about tax evasion is an entire gap in the Nepalese literature. Thus, we tried to inquire the tax evasion in Nepal to add new knowledge.

3. Methodology

Research methodology concerns overall research process from philosophical and theoretical part of the collection and analysis of data. To obtain the Knowledge of the association between and influence on the tax evasion on total tax revenue and Economic development in Nepal, we used deductive approach, mono-methods of quantitative research, survey strategy and obtained the secondary data from primary sources. The quantitative methods normally hold optimistic assumptions; they are based on the objective reality obtained from the mathematical treatment.

We applied the time series data since the FY 2007/08 to 2017/18 to obtain the fact between the variables and the influence of the tax evasion on total tax revenue and influence of the tax evasion on Gross Domestic Product. First of all, we collected data from Economic Survey, publication of Central Bureau of Statistics, Reports of IRD (2008-2018), Journals, books, reports, and the Various Web Sites. We chose two statistical tools for analyses: correlation and regression. To test the overstate association between the variables, we used Karl Pearson's correlation coefficient and to test the influence of tax evasion on total tax revenue and GDP, we used simple linear regression.

In order to test the degree of association between the tax evasion and total tax revenue, we applied the following equations to test the tax evasion and economic growth.

$$r = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{N\sum X^2 - (\sum X)^2} \sqrt{N\sum Y^2 - (\sum Y)^2}} \dots\dots\dots (1)$$

Where, r = Correlation coefficient
X= Tax evasion,
Y= Total tax revenue, and
N = Number of observations

$$r = \frac{N\sum XZ - (\sum X)(\sum Z)}{\sqrt{N\sum X^2 - (\sum X)^2} \sqrt{N\sum Z^2 - (\sum Z)^2}} \dots\dots\dots (2)$$

Where,
X = Tax evasion,
Z = Gross domestic product (GDP), and
N = Number of observations

We also chose to test the influence of the tax evasion with the total tax revenue and GDP. For this purpose, we applied the regression analysis between the variables. Thus, total tax revenue and GDP are the dependent variables while the tax evasion is the independent variable. To observe the influence of the tax evasion we employed linear regression. Thus, the functional forms of the model used were as specified below:

$$Z = f(X) \dots\dots\dots (1)$$

Where,
Y = Total tax revenue (response variable) and
X = Tax evasion
Accordingly,
Y = (2)

Where,
α = Intercept term),
β1 = Parameter known as regression coefficient,
υ = Error Term or unexplained variables.

In another case, to evaluate the influence of tax evasion on the GDP, we employed the following equation of linear regression:

$$Z = f(X) \dots\dots\dots (1)$$

Where,
Z = Gross domestic product

X= Tax Evasion

Accordingly, we specify:

$$Z = \dots\dots\dots (2)$$

Where,

α = Intercept term
β1 = Parameter known as regression coefficient,
υ = Error Term or unexplained variables.

4. Analysis

This main section is a part of the study and concerns the presentation of data, which were collected from different sources. According to the research questions and assumptions of the hypotheses, we divided this section into two parts: to test the relationship between the variables and to test the influence of the tax evasion on total tax revenue and economic growth.

4.1. The degree of relationship of tax evasion with total tax revenue and economic growth

The coefficient of correlation overstates the degree of relationship. For this purpose, we use simple correlation analysis between the tax evasion and total tax revenue and tax evasion and economic growth.

Table 2: Association between Tax evasion(X) and Total Tax Revenue(Y)

		Tax Evasion(X)	Total tax revenue(Y)
	Pearson Correlation	1	-.678*
X	Sig. (2-tailed)		.045
	N	9	9
	Pearson Correlation	-.678*	1
Y	Sig. (2-tailed)	.045	
	N	9	9

Table 3: Association between Tax evasion(X) and Gross domestic product(Z)

		Tax Evasion(X)	Gross domestic product(Z)
	Pearson Correlation	1	-.666*
X	Sig. (2-tailed)		.050
	N	9	9
	Pearson Correlation	-.666*	1
Z	Sig. (2-tailed)	.050	
	N	9	9

*. Correlation is significant at the 0.05 level (2-tailed)

As shown in the table above, the association between tax evasion and total tax revenue and tax evasion and economic growth were 0.678 and -0.666 respectively, indicating a strong negative association between the tax evasion and total tax revenue and tax evasion and economic growth. It means that an increase in the value of tax evasion leads to a strong decrease in the value of total

tax revenue and economic growth in Nepal. Thus, result suggested that not to accept the null hypothesis.

4.2. Influence of tax evasion on total tax revenue

First, we used linear regression model to examine the influence of the tax evasion on the total tax revenue. The following table highlights the model summary of the tax evasion on total tax revenue.

Table 4 Model summary of the influence of the tax evasion on the total tax revenue

Model	R	R ²	Adjusted R ²	Std. error of The estimate	Change Statistics					Durbin Watson
					R ² change	F change	Df1	Df2	Sig. F Change	
1	.678	.459	.382	8962.9533011	.459	5.943	1	7	.045	.957

a. Independent Variable, X (Tax Evasion)

b. Dependent Variable: Y (Total Tax Revenue)

Fundamentally, R² value measures the percentage of variation in the values of the dependent variable that can be explained by the variation in the independent variables and it varies from 0 to 1. Thus, a value of 0.459 means that 45.90% variance of the dependent variable can be explained by the independent variable and the balance of 54.10% can be explained by other variables not included here. According to the model summary, the R² value stood at 45.90%. Statistically, an R² value more than 60% is considered nicely fitted to explain the dependent variable. Similarly, the value of Durbin-Watson test stood close to one, (i.e., 0.957) which positively auto-correlated. It means that, to some extent, the error terms are dependent on each other. In the same way, in the following table, we produced the result of regression coefficient to discuss the influence of the tax evasion on the total tax revenue.

Table 5 Coefficients of the influence of the tax evasion on the total tax revenue

1	Model	Unstandardized		Standardized	t	Sig.	95% Confidence Interval for B	
		Coefficients		Coefficients			L o w e r Bound	Upper Bound
		B	Std. Error	Beta				
	(Constant)	36047.207	5988.542		6019	.001	21886.556	50207.859
	X	-34.037	13.962	.678	-2.438	.045	-67.053	-1.021

a. Dependent Variable: Y (Total Tax Revenue)

According to the stated figure, there is a significant negative relationship between tax evasion(X) and total tax revenue(Y). The empirical result showed that, other things remaining the same, an increase in the value of tax evasion(X) by 1-unit leads to a decrease in the value of total tax revenue(Y) by 34.037. Conclusively, there is a negative influence of the tax evasion(X) on the total tax revenue(Y). Thus, considering only the p-value, the results suggested rejecting the null hypothesis.

4.3. Influence of tax evasion on economic growth

The influence of tax evasion on economic growth is another analysis. Therefore, we fitted linear regression model to test the influence of the tax evasion on the economic growth.

.Table 6 Model summary of the influence of the tax evasion on the GDP

Mode	R	R2	Adjusted R2	Std. error of The estimate	Change Statistics					Durbin Watson
					R2 change	F change	Df1	Df2	Sig. F Change	
1	.666a	.444	.364	40064.34809	.444	5.581	1	7	.050	.939

a. Independent Variable, X (Tax Evasion)

b. Dependent Variable: Z (Gross Domestic Product)

According to the model summary, the value of R2 resulted 0.444 which means that 44.40% of the variance of the dependent variable (Z) can be explained by the independent variable (X) and the rest of 66.60% can be explained by other variables not included here. According to the model summary, the R2 stood at 44.60%, which is lower than the 60%. Statistically, more than 60% is considered the nicely fitted to explain the dependent variable (Z). Thus, the position is weak in this respect. Similarly, the value of Durbin-Watson test stood close to one, (i.e., 0.939) which positively auto-correlated. It means that, to some extent, the error terms are dependent on each other. Similarly, in the following table, we produced the result of regression coefficient to discuss the influence of the tax evasion on the economic growth (GDP).

Table 7 Coefficients of the influence of the tax evasion on the GDP (Economic Development)

1		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
	Model				t	Sig.		
	(Constant)	209502.92	26768.74		7826	.00	146204	272800.95
	X	-147.440	62.412	.666	-2.362	.050	-295.022	.141

a. Dependent Variable: Z (Gross domestic Product)

According to the above table, the test of normality showed the significance level at 5% where the calculated value stood at the same percentage. As the result, there is a significant negative relationship between tax evasion and economic growth. The empirical result showed that, other things remaining the same, an increase in the value of tax evasion by 1-unit leads to a decrease in the value of Gross domestic Product (Economic development) decreases by 147.440. Thus, considering only the p-value, the result suggested rejecting the null hypothesis.

5. Discussion

Tax evasion is a major devil of public finance, which seriously damages the public economic and its stability. Scholars have identified various negative effects of tax evasion in an economy. For example, Gillman and Kejak (2006) claimed that no positive correlation between the tax evasion and the size of the underground, black or dirty economy exists. Similarly, some economists argue that to control the tax evasion is a difficult task. In this regard, Wan (2009) mentioned that governments face difficulties in monitoring the indirect taxes compared to direct taxes. In the case of Nigeria, John and Enoch (2013) claimed that the low quality of the service, tax system, the perception of fairness, low transparency and accountability of public institutions, and high level of corruption significantly influenced tax avoidance and evasion.

The evidence proves that mixed behavior of the taxpayers. For example, the study of Erard and Feinstein (1994) proved that the traditional theory of underreporting the income is the behavior of the taxpayers consequently they make the strategic tax reports, but empirical evidence suggests that many taxpayers are inherently honest and report truthful facts. However, some experts argue that the person who involve in corruption and tax evasion also maintain similar behavior. For example, Tanzi (2017) defined corruption as "the act of breaking an accepted social or legal norm" (p. 2) and presented

a list of factors which stimulate corruption and facilitate tax evasion, avoidance and corruption under a tax administration: (a) lack of efficiency and attendance, (b) lack of morale in workers, (c) level of salary, (d) low and inadequate salary, (e) structure of salary, (f) job tenure, (g) cultural facet of society of the job holders, (h) contagion of workers, (i) discrimination in actions, (j) relationship with politicians of the workers, (k) lack of incentives, (l) appointment of politically connected persons, and (m) corrupt and unethical policymakers.

Nepal is not exception to the tax cheating or evasion behavior. The major compliance issues of Nepal are: (a) low registration in both income tax and VAT, (b) low return of filing, (c) under invoicing and a huge percent of non-invoicing, (d) large percent of the mismatch, (e) tax fraud and cheating (f) a huge amount of tax dues of many firm, company and other organization (g) huge pending cases with Revenue Tribunal, and (h) negative attitude of politicians to make the good tax compliance environment, (i) unnecessary inference from political workers.

Therefore, reduction of tax evasion is possible through the strong legal system. A leading scholar, Bird (2015) stressed on the need for a strong legal system, clear communication and stable law in order to reduce the tax evasion.

6. Conclusion

The phenomenon of tax evasion is probably as old as taxation itself. It is a pervasive disease not only in the economy of Nepal, but also in the entire economy of the world. Policymakers have been keeping their efforts continuous to eliminate the evils of tax evasion and corruption. However, their efforts to keep it in check have been quite ineffective so far. In this regard, Hasseldine and Bebbington (1991) opined, "There are no cures for many serious medical diseases likewise there are, no solutions for the social disease of tax evasion" (p. 320).

In the study, we found a strong negative association between the variables (i.e., tax evasion and total tax revenue and tax evasion and gross domestic product (economic growth)) under correlation analysis. Similarly, a negative influence of the tax evasion on total tax revenue and gross domestic product (economic growth) under the regression analysis was found. The examination of the influence of tax evasion on the total tax revenue showed that, other elements of taxes remaining constant, an increase in the tax evasion by 1-unit leads to a decrease in the value of

total tax revenue by 34.037. In the same way, study of the influence of the tax evasion on the economic growth showed that an increase in tax evasion by 1-unit leads to a decrease in the value of economic growth by 147.440, other things remaining the same. Thus, the association and influence of tax evasion between and on the total tax revenue and economic growth were found in the negative (inverse) stand. Thus, the result suggested that rejecting the null hypothesis.

There is a big problem of tax evasion and tax fraud in Nepal, it reduces not only the effectiveness of the government's operations, also reduces the prosperity of both the nation and its citizens. Several provisions in the income tax act leave room for dual meaning, which could lead to abuse. Therefore, Nepal should establish a less complex and more internationally competitive tax regime in order to reduce both tax evasion and corruption.

7. Scope for further research

This study concentrated only on the association between research variables (i.e., tax evasion, total tax revenue and economic growth) and the influence of the tax evasion on total tax revenue and economic growth observing the data from a period of nine years. However, chances are that results from the study would have been different had we observed data from a longer period. Thus, we suggest further research on this concept again based on long-term time series data.

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Evaluation of Alcohol Industry Establishment Standard in Nepal

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Abstract

A number of alcohol manufacturing industries have been established and working in the country. This study endeavors how these industries are maintaining standards their products. Both primary and secondary data have been used.

Keywords

Alcohol manufacturing, products, marketing strategy.

Introduction

The use of alcohol is the most common risk factor for preventable diseases, injuries and premature death. Alcohol use by young people is risky on driving, vehicle injuries, madness and slaughter, all of which are major cause of teenage impermanence. In Nepal it is illegal to sell alcoholic beverage to youth under 18th year, nearby temple, school, heritage site and public places. The alcohol industries are actively targeting young people with advertising and promotions. Through youth oriented campaigns the alcohol industries create an environment in which the consumption of these dangerous products is acceptable and within some teenager group. Many companies are associated on marketing corporate social responsibility (CSR), health promotion efforts to reduce health risk emphasizes individual behavior changes and ignore the critical role of environment and social factors. Despite that the use of alcohol is not legally right for adult, the aggressive marketing and promotion tactics of alcohol industries targeting the youth to get the better result. The purpose of this paper is to outline alcohol policy in Nepal, Alcohol industry, Sales & market practices and use of Marketing Corporate Social Responsibility related to sustainability of industries.

Nepal is a multi-ethnic, multi-cultural, multi religious and multi linguistic society with a rich repertoire of customs and traditions. It is also a geographically diverse country and a caste bound society. The 2016 population census identified a total of 123 caste/ethnic groups in the country. Nepal is an officially seculars with the constitutional provision of no discrimination against any other religion. Hinduism is practiced by over 86 per cent of the

population, followed by Buddhism (7.8%) and Islam (3.5%). There are also other religions like Kirat, Jain, Christian and others. Historically, various religious and cultural groups practiced alcohol in Nepal.

Statement of the problem

Globally each Country's Government have a determinant role to play in preventing alcohol initiation and reducing alcohol related harm, especially in vulnerable groups such as women and youth. Governments are reviewing their policies to improve the health of populations through active participation in public health activities. Reducing the population's exposure to alcohol marketing can improve health and welfare.

Basically, the alcohol industry is increasing their product visibility through different forms of communication. This means that people will consume more. And this would be fine if alcohol was an ordinary commodity, which it isn't. In fact, alcohol harm is increasing worldwide and the country need to do something about it. Deaths 3.3 million every year are caused from harmful use of alcohol (WHO, 2014)

Nepal government has set the standard to establish and socialized the alcohol and beer industry, these standard have been followed or not by the manufacturer or distributors, it is needed to investigate and evaluate.

Objective of the Study

The main objective of the study is to investigate the national alcohol and beer industry establishment standard, which are issued by government to maintained discipline of industry and effort taken by company to maintain

the capacity, land area, Physical infrastructures, quality of goods, smoothness selling, environment Impact and corporate social responsibility (CSR).

Other specific objectives can be:

- Evaluate national standard followed by sample industry.
- To find out the weakness of the standard.
- To provide the comparative result of standard and realities.

Methodology and materials

Use observation tool to review of the legal documents and policies of sample industry's on licensing process, requirement of land, Mapping, wall, machinery, employee safety and others.

Field visits and interview with alcohol entrepreneur, government officer, local people, Anti-alcohol activist and Women organization.

Limitation of the study

This study is the first knowledge-based of its kind. There are no studies conducted on this topic by a reasonably sample size. The information was collected by purposive sampling method while selected ten distilleries out of 82. So, caution should be taken in generalizing the results. The focus of the study is the alcohol industry establishment standard in Nepal and revenue.

- Small Sample size 10 out of 82
- Short time Span.
- Document base study

Provision of Standard of Establishment of Liquor and Beer Industry (Industrial Promotion Board meeting decision 2069.06.21)

According to Industrial promotion board meeting decision, the following standard is set by Nepal government to licensing the alcohol and beer industry at the time of newly established and to upgrade existing industry:

1. Provision for new industry establishment location:

- a) Not allowed inside the metropolitan, sub-metropolitan and municipality.
- b) To maintain distance minimum 5 km from international border area.

- c) To maintained distance 500 meters far from School, Hospital Temple, national park and any historical palace.

2. EIA/IEE Report and Land ownership arrangement:

- a) Every industry must arrange the 3 hectares land for Brewery and distillery, if they want to establish Distillery, Breweries, wine and cider in a place Min. 4 hectares land within a year of industry registration.
- b) After arrange the land they industry must submit the EIA report to industry department
- c) If the industry establish inside the industrial state they must do land agreement with agreement between Industrial state management and starts further process.
- d) Green belt area needed inside the compound.

3. Special Provision for Licensing:

- a) Every interested investor can apply for industry registration with deposited of Nrs. 5 (Five) lakh.
- b) If existing industry wants to increase the capacity can apply with deposit of Nrs. 3(Three) Lakh.
- c) To get back the deposit amount the company must operate the business within in a 2-3 years otherwise government can forfeit the licenses.
- d) Management of Physical infrastructures
 - If used Molasses - Molasses and Rectified (RS) spirits Mild Steel (MS) tank kept at the level of land.
 - Tank stock capacity need to arrange minimum one month stock of annual production capacity
 - Demineralized plant (DM) inside the factory
 - Installed the Washing, Filling, Sealing, Labeling Machine and Inspection table.
 - 18 feet high of building wall.
 - Quality control unit with minimum one alcohol technologist.

4. Disclose in Licensees:

- a) Punishment on breach of terms and condition
- b) Time and Renewal notice
- c) Environment Impacts
- d) Deposit return provision

5. Provision of licenses dismiss:

- a) Not receive the certificate within 30 days of license issued
- b) Not able to arrange the land as per above clause 2 and production starts within two – three years.
- c) Breach the other terms and condition which is agreed at the time of licensing and other government decisions.

6. Foreign Investment in Liquor Industry

- a) Permission not allow below the 40% v/v brand production.
- b) If used foreign trade mark and they can eligible to transfer the 10% of net profit

7. Provision for existing Industry

- a) Existing industry must complete and upgrade new standard as per clause 3.d within the two years from board decisions date.
- b) To implement those standard government format a monitoring committee, they visit all units, monitor, evaluate and submit the report to board for further decision.

8. Provision of Monitoring Committee

There will be formatted combined monitoring committee to monitor the industries activities and submit the periodic report at Ministry of Finance and Industry of department.

- For Industry Department registered company – Coordinator - Director of monitoring department of industry department-1

Member Representative IRD - 1

Member Representative IRO local office – 1

Secretary Officer from Industry department – 1

- For Cottage and small Industry (CSI) department registration company

Coordinator - Director of Monitoring department of cottage and small industry - 1

Member Representative IRD - 1

Member Representative IRO local office – 1

Member Representative CSI local office

Secretary Officer from CSI department – 1

9. Others Provisions

- Provision of miscellaneous decision can do by Industrial promotion board.
- Sugar Industry can produce Liquor, ENA/RS
- Every company can add or change their objectives and capacity as needed base.

Alcohol Control Related laws, Regulation and Policy

This chapter highlights provision on different rules and regulation to prevention, control and use of alcohol sales, consumption and others:

Alcohol Act, 1974 (2031 B.S. Nepali Calendar)

This Act made basically four provisions for the control of liquor sale:

- License issue and renewal
- Right of raid (in the condition of illicit alcohol production) to VAT officers
- Punishment for shirkers (tax evasion, invalid license, unlawful activities) and prizes for information on unlawful alcohol production.

Articles 3, 4 and 5 of the Act state the provision of production, sale and export/import of alcohol.

Article 3 controls the production of alcohol without license or the conditions set by the license.

According to article 4, no one is allowed to sell or distribute alcohol without license or the conditions set by the license to any bar or restaurant or shop.

Article 5 prohibits of importing or exporting of alcohol without the license or the conditions set by the license.

Section 17 of the Act states that the Act will not hinder anyone who has received a license or contract to produce alcohol from distillery according to the current Nepal Law. This act does not, however, provide adequate provision for the restriction of sale except prohibition to those who are under 18 years of age. It provides little provision of the restriction of alcohol advertising in the media. Further, it fails to recognize alcohol use as problem rather than is taxable asset.

Hotel Regulations and the Sale and Distribution of Alcohol Act, 1966 (2023 B.S. Nepali calendar)

The main provisions of the Act regarding sale and distribution of alcohol are as follows:

- Control of the sale and serving of alcohol by shops and hotels - According to Section 3, hotels or shops which have provision to serve alcohol are allowed to sell alcohol from 10am to 10pm.
- Duty of the hotel owner (not serving excessive alcohol to the customer and alcohol should be served inside the hotel)
- Prohibition of selling and servicing alcohol to children and persons intoxicated with alcohol (Section 7 protects children under 18 years)
- Possibility of prohibition the sale and use of alcohol in a fixed area (Govt. can prohibit any hotel or restaurant selling and distributing of alcohol with a notice).

National Broadcasting Act, 1992 (2049 B.S. Nepali Calendar)

This act discourages the advertisements for alcohol substances from TV, print-media, outdoor. However this act does not prohibit the advertising of alcohol matters. There is an addition of 105% charges on advertising of alcohol.

Vehicle and Transport Regulation Act 1992 (2049 B.S. Nepali Calendar)

The main objective of this act is to prohibit the use of alcohol or any other intoxicating substance by drivers while driving a vehicle. Violation of this rule would cause fine of Rs.1000.

The provision of fine envisaged by the Act is too low in which the rule offender would easily escape by giving money to the police or other authorities.

Local Administration Act, 1972 (2028 B.S. Nepali Calendar)

Article nine of the Act allows the Chief District Officer (CDO) to arrest any person behaving in an unsociable manner due to alcohol use. CDO can fine a maximum of Rs. 1000/- each time the person repeats the same mistake.

Many dry-zones in Nepal are under this Act. Since the purpose of the act is only to control the use of alcohol in case of violation or social unrest, the sustainability of dry-zone is questionable.

Alcohol Rules, 1977 (2033 B.S. Nepali Calendar)

This rule is formulated under the Alcohol Act 1974. It states that no one is allowed to sell alcohol in any form

within the public places such as compound of a temple, educational institution, school and college or within the 200 yards of those institutions. If alcohol use is required by religious purposes, permission is needed from the CDO.

Alcohol (First Amendment) Act, 1999(2056 B.S. Nepali Calendar)

This act came in the context where a massive amount of alcohol is produced and distributed using plastic known as pouch.

In article 3, it prevents production and distribution of alcohol in two conditions: producing or selling alcohol in plastic packet known as pouch and selling it to children aged below 18 years.

These legal measures appear to have addressed alcohol mainly in economic term rather than in social or medical term. Despite introduction of multiple acts, the challenge lies in their effective implementation and no effective network system has been set up to operate the law. Generally, Ministry of Home is responsible to implement alcohol control laws in collaboration with Ministry of Industry, Ministry of Communication and Ministry of Health. But there is no formal institution to co-ordinate the activities of such Ministries regarding the control and/or prevent of alcohol use.

Alcohol rule 1976 (2033 B.S.) cannot be easily operationalized. There are a business holders' pressure vis-à-vis political leaders not to announce the dry-zone in the country. Political commitment is urgently needed to implement such laws even in the limited basis. The burning example is from Doti district. Doti district was declared a dry zone in 1997 but could not be sustained more than one-year. The primary reason for this was the misuse of the fine collected from those who violated the dryzone norms.

Child Act 1992,

Provision 16 prohibits the use of children in selling alcohol and other illegal substances. Hotel Regulations and the Sale and Distribution of Alcohol Act, 2033 B.S., Section 7 has a provision on prohibition of selling and servicing alcohol to children under 18 years and persons intoxicated with alcohol.

Bill (June 2000) - banning the production and sale of the Pouch liquor (70up low quality with low price) and banning the sale of alcohol to minors (under 18) was

tabled in the parliament. The Bill, which was the 2000 amendment of the Alcohol Act 1972 (2031 B.S) is expected to be exercised soon.

Household Level Counter-forces

In Nepalese context, family is the basic unit of decision making in every aspect of life. In the family, it is the head of the household, mostly man, who pulls the resources, allocates it among its members and decides, who should do what. Any attempt to control or reduce alcohol consumption should focus on the family, especially head of the household, and make them aware of the disadvantages of excessive use of alcohol. Therefore, the responses suggested by the adult members to control or reduce alcohol consumption at the household can have greater policy implications.

A range of responses is listed. They include regulation or control of production and selling, regulation and control of alcohol use, and raising awareness at the family level. Majority of respondents were in favor of controlling production and selling of alcohol. Similarly, a substantial number of respondents stressed the need to focus on family, especially head of the household.

Opinion of experts and social workers

Some experts and social workers were enquired for the measures to be taken to control the alcohol use. Their answer is reveled in the Table 1.

Table 1 Efforts Needed to Reduce/Control Alcohol Use at Home (n=270)

Efforts suggested by respondent's	%
Controlling production and selling	48.80
Regulation and prohibition of alcohol use	20.10
Awareness in the family	19.80
Don't know	3.50
No responses	7.80
Total	100.00

Source: Field survey

There was no legal provision to organize a civil society in Nepal. It is after the Democracy in 1990 that people became aware of social problems through their social institutions. In this context, the widening desire of regulating and prohibiting of alcohol production, consumption and selling can be partially the result of the impact of the work of different NGOs, CBOs and ethnic group organizations.

Alcohol Economy in Nepal In Nepal

The laws do not recognize alcohol as matter of any social dimensions other than economic concern. All legal provisions on alcohol concentrate on the business role such as production, distribution and taxes. The alcohol policies are fairly encouraging to alcohol industry. It implies scant restriction on advertisements on electronic media has been introduced. Every year Government is increasing excise duty more than 10% and tightening VAT collection and sales bill on alcohol. Collecting more than 50% of total excise from this sector and 60% of total tax of price of product included excise, VAT and Income tax. Some part of the above tax is utilized in counter advertisements in radio and television making people aware of health and social risk arising from alcohol use. Such efforts are new and their impact is still to be seen in making a difference at alcohol control.

Most laws are violated in every aspects of life. License provisions and hotel or restaurant's regulations are weakening due to lack of supervision and corruption, and print media are being attracted by good money from the alcohol producers.

Alcohol is produced at home and at industry. Both national and multinational companies are involved in producing distilled and brewery products. A total number of large, medium and small alcohol industries registered in Department of Industry were 91 (82 distilleries and 9 breweries by 2015). Latest data FY 2018-019 the main holding brands 25up, 30up and beer annual sales and excise duties collected from distillers.

Alcohol was produced and sales 59,74,132.5 LP liters (Table 2) and generated excise duties of NRS. 7,13,31,14,205.00. Every year government increasing the aprox 10% duties which is effecting to hiking the consumer price, it's impact on 25up sales. This result seems revenue also slacking down.

In the part of brewery produced beer is selling 11,50,50,663 bulk liters (Table 3) and generated excise duty of NRS. 17,257,599,450.00. Alcohol and beer excise duty contribute more than 50 per cent of the total excise duty and 8 to 10 per cent of the total national revenue. It is playing better role to collet direct tax to nation.

In Nepal every year beer and liquor industry is rapidly growing up. Now the major market share 40up, 50up and 70up range and domestic product is significantly

increasing but those parts are not included in this study approx. sales of those industry around fifty lakhs cases means 4,50,00000.00 liters (5000000x9ltrs).

The poorer household, they produce alcohol at home for the purpose of selling also. But that is not controlled by government. If the government take them in own control the contribution also goes up. This holds true for traditional alcohol users in Nepal. Mostly alcohol is produced during the feasts and festivals. An overwhelming majority of the alcohol producers produce for family use as well as for sale to earn.

Table 2 : – Five years sales trend of alcoholic beverage Whiskey, Vodka and Rum (fig in 25 and 30 up product) – (Source market survey and government budget speech)

Brand	2016-17	2016-17	2017-18	2017-18	2018-19
Whisky	505886	534700	565732	419663	374042
Vodka	701484	734571	789695	851296	392516
RUM	150183	153694	209417	233227	181717
Total cases	1357553	1422965	1564844	1504186	948275
LP Liter(Avg)	6.3	6.3	6.3	6.3	6.3
Total LP ltrs.	8552583.9	8964679.5	9858517.2	9476371.8	5974132.5
Excise Rate per LP	906	788	906	997	1194
Total Excise Du- ties NPR.	7,748,641,013	7,064,167,446	8,931,816,583	9,447,942,685	7,133,114,205

Table 3 – 5yrs Sales trend of Beer industry (fig. in case) –(Source market survey and government budget speech)

Brand/Year	2014-15	2015-16	2016-17	2017-18	2018-19
Gorkha Brewaries	7300000	9300000	11500000	11200000	9700000
Mt. Everset Bre- waries	647000	650000	665000	550000	500000
C G Brewaries	390000	725000	647000	1300000	2700000
Himalayan Bre- waries	325000	175000	190000	150000	90000
Nepal Brewaries	75000	100000	150000	145000	153000
Tiger Breweries	250000	250000	437000	507000	658085
Sherpa Breweries	35000	73000	165000	170000	185000
Yeti Breweries			342000	350000	370000
Raj Breweries				150000	394000
Total Cases	9022000	11273000	14096000	14522000	14750085
Per cs bulk ltrs	7.8	7.8	7.8	7.8	7.8
Total Bulk Ltr	70371600	87929400	109948800	112101600	115050663
Excise duty Per BL	92	98	106	115	150
Total Duties NRS	6,474,187,200	8,617,081,200	1,654,572,800	3,026,234,000	17,257,599,450

Finding

Followings finding are listed below-

- Major percentage of the industries are following set standard.
- Some existing industries still not maintaining the standard i.e. level of green belt, open space, infrastructures, building and land.
- Regular monitor is needed.
- Weakness on quality control area production, technologist, storage in spirits, store management, environment impact.
- 25up, 30up alcohol and beer have major contribution on excise duties tax.
- There is possibility to generate more revenue.

Conclusions

The alcohol industry is sensitive and highly risky. Worldwide acknowledges that preventing misuse of their standard products is in their long-term strategic interest and is therefore consistent with their economic objectives, while turning a blind eye on misuse is ultimately bad for business. Often alcohol producers recognize that long-term growth is best built on an ethical and responsible foundation. Their social concern is also founded on the realization that the misuse of alcohol can affect their business adversely. The set standard is viewed more than just reaching compliance with codes of public issue. The alcohol industry most to followed or maintained their standard to maintained their business, pertaining the government decisions which cops their objectives otherwise there may be problems.

Alcohol and society have bitter relation but there are activities that pertain to alcohol itself. Alcohol standard control and maintained the discipline in investor, product quality and environment for significant changes, which are related to social issues, safety. Many industries are

concern on these issues and maintaining the standard but some have still problems. So, the government strictly monitors and punished industry to maintain the social issues as well as business.

Further Research Issues

- Further research is needed to understand the total no of industries.
- More research is needed to understand the socio-cultural characteristic of alcohol in community where alcohol is a part of life.
- Focus to study on among children and young people at different geographical, economic, cultural and social level to understand fully how and to which degree alcohol is affecting them nationally and globally.
- More research is recommended in environment impact, effect of industry inside/nearby residential.

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Cause of time and cost overruns in the Construction project in Nepal

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Abstract

There are many works in construction in Nepal. To build the country, there must be different buildings, roads, bridges, etc. with rapid flights. But here it seems to be slowly delayed for various reasons. Many people have studied in this regard. But no one seems to have thought about reducing it. Therefore, I have prepared this article by studying the main reasons for construction delay and cost overruns and looking at how this cause can be reduced. This will enhance the delivery of project within the set time frame.

This study analyses the time overrun and cost overrun at construction projects in Nepal by studying the Literature Review. Study in different sectors such as the road transport and highways, buildings, Hydropower etc. Construction projects are found to have largest amount of time and cost overruns.

Most normal reasons for time and cost overruns are identified as delay in land obtaining, delay in timberland freedom, law and order problems, price escalation, high capital cost, poor execution of contractor and postponement in the supply of materials. The connection between time overrun and cost overwhelm is examined in various divisions. Further, the impact of venture length and undertaking spending plan on schedule and cost invades is researched.

Keywords

Construction, contractor, bid, Nepal, Time overrun, Cost overrun.

Introduction

Background

The development business undertakes a significant job in doing completely created country status. To complete this a country needs to keep its development industry sound by acceptance most recent innovations and dealing with the activities appropriately. Finishing projects on time is a pointer of proficient development industry. Truth be told, a task is considered 'fruitful' on the off chance that it is finished on schedule, inside spending plan and to the predefined quality. Regularly, when the activities are delayed, they are either expanded or quickened and hence, obtain extra expense. To the dislike of proprietors, contractual workers and experts numerous tasks experience broad postponements and along these lines exceed beginning time and cost measures. The development procedure is liable to numerous factors and flighty components. Conveying a task on time does not happen by trusting that the required fulfillment date will be met. To design and deal with an effective task,

the three parameters of time, cost and quality ought to be considered. The customers in the development business are fundamentally worried about quality, time and cost. However, larger part of development activities are secured based on the requirements time and cost. Cost acceleration and time overwhelms are regularly connected with poor administration trains. In Nepal the development business is the most remarkable supporter of the financial development. The greatest customer of the development business is government open works projects. These projects are huge for nearby network and must be conveyed on schedule. Any deferral in conveyance won't encourage the full motivation behind the tasks' implementation a work in progress plan. Among all acquirement strategies the Design and Build (D&B) projects is noteworthy in executing improvement extends in Nepal and different nations.

The undertaking directors and the group need to comprehend the elements causing these postponements and cost overwhelm prompting project disappointments. The quantitative examination of poll review will rundown

down the hazard causing factors by positioning. This will help the task administrators and the specialists to make proactive move to such disappointment circumstances. Next area manages time and cost related writing audit pursued by research procedure, exchange and examination by SPSS lastly the ends.

Statement of problems

There are many works in construction in Nepal. To build the country, there must be different buildings, roads, bridges, etc. with rapid flights. But here it seems to be slowly delayed for various reasons. Many people have studied in this regard. But no one seems to have thought about reducing it. Therefore, I have prepared this research proposal prepared by studying the main reasons of construction time and cost overrun and looking at how this can be reduced.

Hence urgently needed to study Cause and impact of delay completion of different construction project in Nepal. I have seen this study very important to complete the following tasks.

- ❖ Find out the main reason why the construction work is delayed.
- ❖ To speed up the construction work quickly, no reason to come.
- ❖ Addressing the elements of delay in construction and addressing timely manner.

In addition, there are numerous hazard factors inflicting cost within the Construction Project, afterward, analysts tend to bring this issue into to boot examine with the purpose of characteristic the elements and their positioning of significance. Within the current investigation, scientists have tried to seek out the needs for the underlying evaluated and last add, and completely different reasons for time overcome. Morris (1987) discovered four key factors that were the little question affected on cost. These variables incorporate define changes, lack of wisdom, capricious climate condition and also the uncertainty in prices of building materials. it's important to possess a high to the underside understanding of the exceptional problems within the Construction Project. Consequently, the paper expects to offer high to bottom light-weight regarding this reasons for project deferral and price overrun in each created and making nations, and framework the attainable proposals for dominant enterprise postponement and price overrun in future activities by dissecting the suitable investigations from numerous nations and Nepal.

Delays on Construction projects are a complete miracle. They are quite often joined by cost and time overcomes. Construction project delays host an unfavorable impact on gatherings (proprietor, temporary worker, and expert) to an agreement regarding a Construction in antagonistic connections, doubt, suit, mediation, income issues, and a general sentiment of misgiving towards each other. Along these lines, it is fundamental to characterize the real reasons for the delay with a specific end goal to limit and evade the deferrals in any Construction project. We can discover an excessive number of research articles about the reason for Construction delay in Nepal. In any case, we can't locate the real reason to postpone top to bottom and we are not the accomplishment to limit the accept Construction works. In Nepal. Henceforth earnestly expected to examine Cause and effect of delay inside and out the fulfillment of various Construction project in Nepal.

Significance of Study

Development industry has been a bustling industry in the twentieth century. Immense huge numbers of tasks have jumped up, particularly since the Second World War. With the development rate going up continually, a savage rivalry has been set up among the manufacturers. A development project is commonly a progression of exercises that have a particular goal to be finished inside specific determinations and the begin/end dates are all around characterized. The development projects are normally capital serious with a ton of obligation and premium parts and everyone needs to gain benefit on the speculation, as quickly as time permits. This has provoked the flood of quick track projects around the world.

The motivation behind this paper is to examine for all intents and purposes all viewpoints identified with postpone investigation on a development project, trailed by a contextual analysis. Despite the fact that the paper subtle elements for all intents and purposes each perspective related with the defer investigation, spotlight will be on the Lump Sum Contract from the perspective of a contractual worker, as it conveys the greatest hazard for a temporary worker.

As it is the agreement record which subtle elements the approaches if there should be an occurrence of postpone claims, the accompanying segment will examine different kinds of agreements and components for choosing the sort of agreement before formally tolerating it.

Methodology

Data collection

Information was collected from Construction project. It's time duration on, cost and Management process for Construction works, Procurement process, availability of Labor, materials, government policies, Decision making procedure etc, was studied. This study was carried out based on literature review, questionnaire survey, interview and case study. The research methodology was contain three phase. The first phase was included a literature review, second phase was questionnaire survey, interviews and third phase was carried out by case study. The literature review was conducted through books, conference proceedings, internet and international project management journals. Questionnaire survey will include 75 respondents made up 10 Consulting firm, 20 Engineers, 15 Contractors, 10 Clients/ Owners, 20 Construction workers/employees. For Case study two project was selected. Hence, will identify causes of delay and cost overrun in each project separately augment better understanding for future warning and proactive actions to be undertaken in future project.

Literature Review

Cost and time overrun are regular in construction and building development projects. The construction project is a mission, undertaken to create a unique facility, product or service within the specified scope, quality, time, and cost [Chitkara, 2004].

In follow, however, some construction comes encounter cost, delay on completion time or poor workmanship upon completion. Cost, poor quality accomplishment and delay of construction projects need associate in-depth investigation to improve the outputs of the construction trade.

According to Chalabi, et al, (1984), adequate planning at the early stages of a project is crucial for minimizing delays and cost overruns.

Researches on construction projects in some developing countries indicate that by the time a project is completed, the actual cost exceeds the original contract price by about 30 % [Al-Momani, 1996]. One of the most comprehensive studies of cost overrun that exists found that 9 out of 10 projects had cost overrun. Overruns of 50 to 100 % were common [Flyvbjerg, et al, 2003].

It is not uncommon to determine construction comes failing to realize their mission of making facilities at intervals the desired price and time. Hardly few comes get completed on time and Within budget in Nepal.

Finding out Causes of cost and Time overrun

Construction projects in Nepal face significant expanse of time and cost overruns. Based on the Literature Review, survey and study of infrastructure projects, it is observed that the tunnel, bridge and building sector experience highest amount of cost and time overruns compared to other sectors. Although the fundamental factors of cost and time overruns share common features, the impact and the frequency of rates of these factors are project specific and cannot be generalized. In general, increase in time overrun increases cost overrun in construction projects. Activities with longer span are exposed to varieties/ changes in degree, climatic changes and inflation, along these lines prompting time and cost overwhelms.

The key issues causing construction time overrun are: financial problems, impractical contract durations executed by clients, unwell defined project scope, client-initiated deviations, under-estimation of project cost by consultants, poor inspection/supervision of projects by consultants. Other factors were underestimation of project complication by contractors, poor site management, and inappropriate construction methods used by contractors and delays in the issuance of permits by government agencies. Factors affecting cost overruns are financial difficulty by client, delays in payments of completed works, variations in designs, shortage of communications plans, poor feasibility and project analysis, poor financial management on site and material price variabilities.

There are too many causes for cost and time overruns in the construction project. If the construction project is going to be a delay, there will be more chances to make the cost overrun but there should be occurrence time overrun. There are many types of delay, according to causes in the construction project.

Generally, delays can be divided into three major types, namely: (1) excusable and non-excusable; (2) compensable and non-compensable; and (3) concurrent.

Compensable delays are those that are for the most part brought about by the proprietor or its operators. The most widely recognized type of compensable delay is lacking drawings and specifications, yet compensable delays can

likewise emerge from the proprietor's inability to react in an opportune manner to demands for data or shop illustrations, proprietor's adjustments in plan or materials, and proprietor's interruption and additionally change in the grouping of the work. The temporary worker is qualified for both extra cash and extra time coming about because of compensable postponements.

Non- Compensable delays fundamentally, these delays are brought about by temporary workers or subcontractors or materials providers, through no shortcoming of the proprietor. The temporary worker may be qualified for pay from the deferring subcontractor or provider, yet no pay is expected from the proprietor. Along these lines, non-compensable deferrals more often than not result in no extra cash and no extra time being conceded to the temporary worker.

Reasonable defers Excusable delays, otherwise called "power majeure" delays, are the third broad class of delay. These delays are usually called "demonstrations of God" since they are not the duty or shortcoming of a specific gathering. Most contracts take into consideration the temporary worker to get an increase of time for passable postponements, however not extra cash.

Concurrent delays if just one factor is postponing development, it is normally genuinely simple to compute both the time and cash coming about because of that solitary issue. A progressively muddled – yet additionally increasingly regular – circumstance is one in which more than one factor defers the venture in the meantime or in covering timeframes. These are called concurrent delays.

Conclusion

The above discussion finds that despite the fact that there are a lot of the manager's tactics to control time and cost overrun in Construction projects, a large portion of the activities are meeting the issue. Many projects are experiencing a direct result of defer the piece of the customer to supply of a portion of the material which as a feature of the legally binding understanding they need to supply to the contractual worker or delay in settling Running Account bills. These issues together with different issues, for example, delay in getting clearances and different issues recorded above makes it increasingly hard to finish the project on schedule and inside arranged expenditure plan. Another trouble looked by the Construction business is the draw productivity of assets, particularly gear efficiency. And still, at the end of the day,

the utilization and execution of better task the board and the executives systems can improve the circumstance and can prompt accomplishment of more development and advancement to the economy.

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The Factors Affecting Scale-up Aspiration in Start-ups Across National Economic Growth Stages

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Abstract

The Innovation and Scale-up of Start-up companies are becoming important national tasks. The growth of start-ups contributes to the economic revitalization of a country or region through job creation. Its importance in the current economic climate is growing. However, there are differences in the effects of entrepreneurial action on economic growth in the economic development of a country. Developed countries have made radical changes through 'entrepreneurialism', a new value system for national innovation in the 21st century. The national innovation policy centered on entrepreneurship has spread worldwide. At present advanced economies are shifting from a start-up support policy to a scale-up oriented policy paradigm such as 'Scale-up America', 'Scale-up UK', 'Scale-up Denmark'. It is necessary therefore to grow start-ups into strong medium-sized companies and to lay the foundation for survival.

However, there is a difference in realizing the national innovation policy according to the stages of economic development. While countries with innovation-driven economies have achieved qualitative growth centered on entrepreneurial values, the economies of the efficiency driven economy and the factor driven economy were trying to achieve quantitative growth such as increased production and exports. Therefore, it is necessary to confirm the difference between entrepreneurial values and activities that affect scale - up of entrepreneurs according to the stages of economic development. Since it is difficult to measure the growth of start-up companies in a short period of time, scale-up can be estimated by factoring in the scale-up aspiration of entrepreneurs or start-up companies, which are important determinants of actual scale-up of start-ups. Therefore, the purpose of this study is to consider the antecedent factors that influence the scale-up aspiration of the start-up firm to grow into a scale-up company, and empirically identify the differences between the stages of economic development and entrepreneurs in the country.

Keywords

Scale-up aspiration, Innovation orientation, Opportunity-driven motivation, Stage of national economic development, Multi-level Analysis

The Effects of Mobile Shopping Mall Attributes on Consumer Loyalty: Consumers' Experience with O2O Service as a Moderating Variable

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Abstract

Recently, the proportion of mobile shopping using mobile devices such as smartphones has increased significantly. With the increase of mobile shopping, competition of mobile shopping mall becomes more intense, and mobile shopping mall focuses on securing loyal consumers in order to gain competitive advantage. However, despite the explosive increase in users of mobile shopping malls, research on the properties of mobile shopping malls is still insignificant. This study empirically analyzed the effects of mobile shopping mall attributes on consumer loyalty in mobile shopping. In particular, we measured whether the experience of the new platform, O2O service, has a moderating effect between the attributes of mobile shopping mall and consumer loyalty.

The survey was conducted online for individuals who have experienced mobile shopping. As a result of analyzing the final 276 questionnaires, it can be concluded that ubiquity, convenience, and personalization, which are general attributes of the mobile shopping mall, security and transitivity, which are service quality attributes, brand reputation and design, which are the characteristics of the company, are the positive effects on consumer loyalty appear. Also, it was confirmed that only the design factors, which are the characteristics of the company, are moderated by the experience of O2O service. Consumers do not have enough knowledge about O2O service and do not place importance on O2O service. Rather, it can be interpreted that the general attributes, service quality attributes, and company characteristics of mobile shopping mall are more important.

Consumer loyalty directly affects the profit of the mobile shopping mall. Therefore, it is very important to demonstrate the general attributes of the mobile shopping mall, the service quality attributes, and the characteristics of the company that affect the consumer loyalty. The results of this study are expected to contribute to the activation of mobile shopping malls by providing effective and differentiated attracting strategies to existing executives of mobile shopping malls as well as pre-founders who will start new mobile shopping malls.

Keywords

Mobile Shopping Mall, O2O Service, Consumer Loyalty, Service Quality Attributes, Company Characteristics

A Study on the Influence of Corporate Characteristics of Technological Innovativeness-Type Small Businesses and Technological Innovation Orientation on Innovation Performance

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Abstract

Korea's small and medium-sized companies are facing a situation where they need to secure technological competitive advantage through continuous innovation processes in order to survive and succeed in the face of continued competition pressures, and in order to lead high-value-added businesses, they need manufacturing-oriented innovation with R/D capabilities. There have been endless studies trying to find out what conditions are required for continued innovation by technology start-ups to be successful.

To look at the impact of innovation on innovation performance by innovative corporate characteristics and oriented toward innovation, this study will look at the key themes of an enterprise's business environment characteristics: environmental uncertainty, decentralization, technological innovation, technological advance orientation of CEO's technological innovation orientation, and in particular how the technology innovation capabilities of small and medium-sized innovative companies affect innovation and R/D co-experience. To this end, research models and hypotheses, including research variables that affect innovation performance, are established and empirical analysis will be performed by applying a structured analysis technique to measure variables that affect an entity's innovation performance.

Keywords

Corporate characteristics, Technology Innovation Orientation, Technology Innovation Capability, Innovation Performance, Innovative Work Behavior, R&D cooperation Experience

Supply Chain Management as a Key Factor for Gaining Competitive advantage in Soap and Detergent Industries with Reference to Nepal

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Abstract

It is well known that supply chain management is an integral part of most businesses and is essential to company success and customer satisfaction. The main objective of this study was to investigate the importance of supply chain management in soap and detergent manufacturing industries in Nepal for gaining competitiveness advantage in the market. The data collection is based on Primary and secondary sources. The study concludes with the better understanding of SCM benefits for soap and detergent industries as well as the understanding of SCM for gaining the competitive advantage through the proper planning and control by Nepalese soap and detergent industries.

Keywords

Supply Chain Management, Competitive Advantage, Detergent industries.

Background

Supply chain management(SCM) is the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage. It represents a conscious effort by the supply chain firms to develop and run supply chains in the most effective & efficient ways possible. Supply chain activities cover everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities.

The concept of Supply Chain Management (SCM) is based on two core ideas:

1. The first is that practically every product that reaches an end user represents the cumulative effort of multiple organizations. These organizations are referred to collectively as the supply chain.
2. The second idea is that while supply chains have existed for a long time, most organizations have only paid attention to what was happening within their “four walls.” Few businesses understood, much less managed, the entire chain of activities that ultimately delivered products to the final customer. The result was disjointed and often ineffective supply chains.

The organizations that make up the supply chain are “linked” together through physical flows and information flows.

Physical Flows

Physical flows involve the transformation, movement, and storage of goods and materials. They are the most visible piece of the supply chain. But just as important are information flows.

Information Flows

Information flows allow the various supply chain partners to coordinate their long-term plans, and to control the day-to-day flow of goods and materials up and down the supply chain.

Supply Chain Management (SCM) is the major function of any manufacturing organization which describe distribution options and network of facilities. Functions such as material procurement, transformation of the material into intermediate and finished products, and then distribution of the finished product to consumer are included in SCM. Though the complexity of supply chain may vary vastly from industry to industry and firm to firm but are found to exist in both service and manufacturing sectors, however it represents a logical advance in our evolving understanding of business performance (Smith and Budress, 2005).

According to the Council of Supply Chain Management Professionals (CSCMP), supply chain management encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and logistics management. It also includes the coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies (CSCMP, 2011).

In general, a supply chain includes the activities of information systems management, sourcing and procurement, production scheduling, order processing, inventory management, warehousing, customer service and after-market disposition of packaging and materials. Thus, the integration of these activities through improved relationships ensures a sustainable competitive advantage.

A very simple example of supply chain can be explained involving a single product. The chain involves procurement of raw material from vendors, transformed into finished goods in a single step, then transported to distribution centers and ultimately to consumer. Realistically supply chains are always very complex having multiple end products with shared components, facilities and capacities. The flow of materials is not always along a simple network, various modes of transportation gets involved and the cost of material for the end items may become exorbitant (Bertodo, 2002).

Traditionally planning, procurement, manufacturing, marketing and the distribution set ups in the organizations along the supply chain operate independently having their own objectives and generally these are conflicting. Marketing objective of high consumer service and attainment of maximum sales output, always conflicts with manufacturing and distribution goals. Many manufacturing operations are designed to maximize output and lower costs with little consideration for the impact on inventory levels and distribution capabilities. Purchasing contracts are often negotiated with very little information beyond historical buying patterns. The resultant of these factors is creation of a void with respect to an integrated plan in the organization. There is a definite need for a system through which these different functions can be coordinated and integrated together (Bertodo 2002) and SCM is a strategy through which such integration can be achieved.

SCM is managed by the supply chain which can be expressed as the sum of parts involved in fulfilling a customer requests and consists of suppliers, manufactures, warehouses, retailers, transporters and customers. The purpose of a supply chain analysis is to maximize company's profit in the process of generating value for the customer, namely maximizing the difference between the final product worth and the total cost expended by the supply chain to provide the product to the customer (Franca et al., 2010).

Competitive Advantage

Competitive advantage is the leverage that a business has over its competitors. This can be gained by offering clients better and greater value. Advertising products or services with lower prices or higher quality interest consumers. Target markets recognize these unique products or services. This is the reason behind brand loyalty, or why customers prefer one particular product or service over another.

Competitive advantage seeks to address some of the criticisms of comparative advantage. Competitive advantage rests on the notion that cheap labor is ubiquitous and natural resources are not necessary for a good economy. The other theory, comparative advantage, can lead countries to specialize in exporting primary goods and raw materials that trap countries in low-wage economies due to terms of trade. Competitive advantage attempts to correct this issue by stressing on maximizing scale economies in goods and services that garner premium prices (Stutz and Warf 2009).

Introduction to the soap and detergent Industry

Soap and detergents are used very commonly in our daily life. We use them for washing clothes and utensils. Soap and detergents industry is a pretty old industry. Soap and detergents industry include products for washing, viz laundry soaps and synthetic detergents. These are consumer items. Technology, quality, marketing & distribution network determine the success of the units in this sector. The industry has developed both in the small-scale sector and the organized sector; yet 90% of production of laundry soap is in the small scale sector. Two critical raw materials are required for the production of laundry soaps. Nominal investment is sufficient for this industry as it involves simple methods of processing and manufacturing of various types of soap and detergents.

Soap is a cleansing product created through a chemical process of combining fat or natural oil with an alkali (such as wood ashes, lye and chemicals) under controlled conditions. Factories producing soap were developed in France and Italy, where olive oil was plentiful and was used as the main ingredient

throughout the 16th, 17th and 18th centuries. In the nineteenth century, palm oil began to replace olive oil in the formulations. Even in the twentieth century, quite a few manufacturers continued to make soap by boiling fats and lye to produce soil cakes.

In the United States, 1837 marks an important year. The duo, William Procter and James Gamble established a candle and soap making business. Their company, Procter & Gamble grew into one of the foremost soap and detergent manufacturing company in that country. The company's famous 'Ivory' soap bar was first introduced in 1882. Lever Brothers, another major soap and detergent company offered "Lifebouy" and "Sunlight" soap bars in 1895.

Soaps and detergent industry in Asia

Basic products like bar soaps remain dominant in Asia, as the bulk of consumers in most markets earn low incomes and only buy low-cost items. However, this situation showed signs of change over the past three years with the bar soap increasing in value from 68.2% to 72.1%. This was due to consumers at the lower end of the market trading up to more expensive types of soaps as their average income increased. Liquid soaps became increasingly popular until the economic crisis in 1997 made the consumers to economize. The popularity of liquid soaps and detergents is due mainly to their hygienic packaging. The regional market presents tremendous opportunities to the soap manufacturers in terms of their share to cater the needs of population. With India's population officially exceeding one billion at the end of the last century and over 1.5 billion in China, the majority of them living below the poverty line, appropriate marketing strategies were needed to turn this region into an area of advantage for the industry.

Soaps and detergent Industry – In Nepal

In ancient Nepal too, people used soap preparations made from plant or animal fats. There is no any fixed history of the evolution soap industry of Nepal. Though, previously the soap in Nepal were homemade or in small

scale. The soap were called as "Dalla Sabun". Modern technology has provided synthetic detergents that have slowly replaced soaps. The detergents were used chiefly for hand-dishwashing and laundering of fine fabric. This was followed by the development of all purpose laundry detergents introduced in the U.S in 1946. Today the detergent market is a highly competitive one.

As a history of soap and detergent industry in Nepal we have a record of establishment of Mahashakti Soap and Chemical Industry Pvt. Ltd in 1974 AD. Unilever Nepal Limited as a subsidiary of Hindustan Lever was established on 1988 AD. Recently, there is 60 soap and detergent industries operating in Nepal including small and large scale operation.

Unilever Nepal has a leading industry in production of detergent power in Nepal named as "Wheel". Similarly, Gopal Soap Industries Pvt. Ltd is the second leading soap and detergent manufacturer in Nepal after Unilever Nepal Pvt. Ltd. Gopal Soap Industries P. Ltd dealing in detergent powder after "Wheel" with the name "V-Series". The sale of V-Series has been drastically increased within the last decade. According to them, out of many factors for the sale growth of V-Series one major factor is proper planning and implementation of supply chain management. They would have to say that they have proper arrangement with the supplier as well as with the logistic company for upstream movement of raw material and other component as well as proper control over the marketing intermediaries for the downstream. This has made company competent with regards to the customer service which leads to the better sales growth.

Supply Chain Management and Soap and Detergent Industry

Supply chain management (SCM) is a management philosophy designed to have the control over the flow of raw material from suppliers to the flow of finished product to the end customers. It is a management technique for integrating different business activities between enterprises (Ellram & Cooper, 1993 and Hong, 2005). This refers to the methodology for integrated management of all activities in the entire supply chain process, and encompasses the flows of goods concerning the conversion and logistics of materials and finished products, the flows of information that supports those processes, and the flows of capital which entirely assists in noticing down the business/firm performance. SCM

is a customer empowering supply system aimed at harmonizing product and service flows, information being created, and individualised customer values in the market, as well as providing innovative solutions. It is a business philosophy that guides companies and their business partners between interacting distribution channels, and internal resources and production capabilities, in the right direction (Ross, 1998). Park (2003) defines SCM as a collaborative strategy to rebuild an organization by rearranging new ITs and enhance the business efficiency of enterprises by making strategic alliances that ensure a competitive edge for their products and services. Simchi-Levi et al. (2000) define SCM as a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed in the right quantities, to the right locations, and at the right time, in order to minimise system-wide costs while satisfying service level requirements. This eventually refers to an integrated process for providing the end consumers with the value that they demand. Thus, SCM seeks to achieve comprehensive optimisation in the flow of products and information from production to final sales that better responds to actual consumer demands and improves business efficiencies.

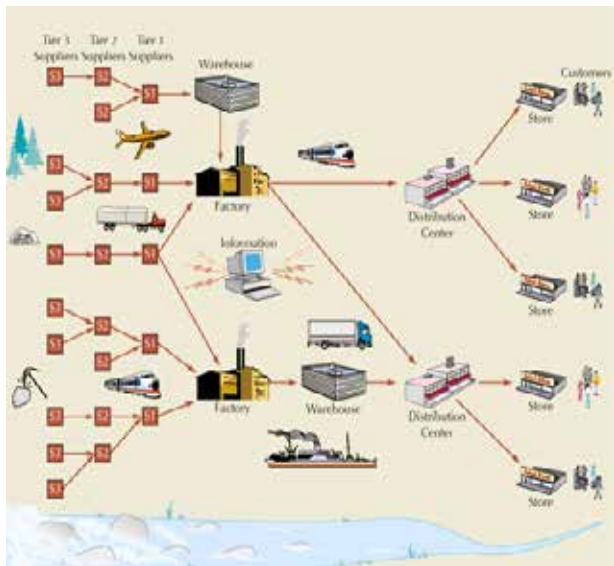


Fig- 1 – Supply Chain Management

Objectives of the Research

The objective of this article is to illustrate the importance of supply chain management to the import based companies for gaining competitive advantage in Nepalese market. This article has major following objective;

1. The main objective of this article is to know the importance of supply chain management to the soap and detergent industry.
2. Secondary the meaning of competitive advantage
3. Finally, the importance of supply chain management for gaining competitive advantage soap and detergent industry in Nepal. This can be lower prices, higher quality, higher dependability or shorter delivery time and can lead to high levels of economic performances, customer satisfaction and loyalty and relationship effectiveness.

Methodology

The study is based on primary and secondary data. In this research paper the primary data is collected directly through the personal in-depth interview to the respondent from Gopal Soap Industries Pvt. Ltd. The secondary data is collected from the Annual report, newspapers, websites etc.

Data collection and analysis

The researcher has asked questions to the personnel of the companies who are engaged directly with the supply chain function in the organization and their answers are presented below.

1. *Interviewer* - According to your view what is supply chain management?

Respondent - Managing/ arranging to send goods on time, from seller to re-seller and re-seller to consumer with an effective manner, in a low cost is supply chain management.

2. *Interviewer* - Do you think supply management is important to your organization for being competitive in market?

Respondent - Yes, providing service or product on time, in a good price is main key to be successful on this competitive market.

3. Does your company evaluate the performance of the Supply Chain Management practices? If yes, at what interval?

Respondent - Yes, On quarterly Basis

4. Which attributes is / are given more significance in the evaluation of the performance of the Supply Chain Management practices?

Respondent - Sale report (Increase on sale), Consumer interaction, Transport management, logistic cost (in bond and out bond cost) etc

5. Does your company have a separate logistic department?

Respondent – -Yes

Findings and Conclusion

- i) This research paper is based on two major variables, the first variable is the Supply Chain Practice i.e (supplier, partnership, customer relationship, level of information sharing and quality of information sharing, postponement) and the second is competitive advantage i.e (price and cost, quality, delivery dependability, product innovation, time to market). The result of this paper concludes with the following importance of Supply Chain Management to the soap and detergent industry for gaining competitive advantage:
- Selection and Management of Suppliers effectively for supporting entire procurement processes.
 - Making Transportation and Distribution efficient for marketing campaigns.
 - Communicating with Customers periodically and monitoring a flow of the products
 - Responding to Delivery problems in a collaborative way.
 - Proper handling of raw material on import as well as in a warehouse.
 - Effective selection of supplier.
 - Proper supply chain practice leads to the consumer satisfaction.
 - Effective selection of supply chain partners for the flow of goods from point of production to the point of consumption.
 - Proper implication of supply chain practice leads to the cost reduction in the import.
 - This research indicates that the proper implication of supply chain management practice in an organization works as competitive advantage for the importers.

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Need of Digitization in the Banking Sector for its Growth and Sustainability

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Abstract

The digital revolution has transformed the world's financial systems. This is true not only for the customer experience (how hundreds of millions of people now manage their financial lives), but for the system at every level: how financial institutions manage their operations, how investors analyze risk and make decisions, how capital markets move, and how policymakers approach their work. Due to this the banking landscape as we know it is changing. A new wave of technology is revolutionizing the way customers engage with their finances. Banks are now having to rethink the way they do business to deliver a better customer experience, remain competitive, and derive a sustainable business model. But why is digitization so important for sustainability and growth of the Banking Sector?

Extant literature prescribes digitization is an important factor to a bank's growth and sustainability in the long run. Digitization has not only made processes simpler and operations of the banks easier, it has also made the policy end of the bank stronger. It has made data processing and customer interactions more relevant. Different experts opine digitization to be a major factor in a bank's growth and sustainability. Published data shows customers are banking online more than physically visiting the branches. In such backdrop, digitization has become more pertinent. Without digitization, let alone bank's growth, its sustenance may be in question.

By the review of extant literature, unstructured interviews, and study of current banking practices, this article tries to explore why digitization is needed for the growth and sustainability of banking sector or a bank.

Keywords

Banking, digitization, sustainability, growth etc.

Introduction

In mid-90s Bill Gates made a statement that "Banking is necessary, banks are not". What sounded provocative back then is a reality today. [1]

The banking landscape as we know it is changing. A new wave of technology is revolutionizing the way customers engage with their finances. From social to mobile capabilities, banks are having to rethink the way they do business to deliver a better customer experience and remain competitive. [2]

Banking has traditionally been a conservative industry. New digital technologies, however, have drastically changed the situation. Some banks have been proactive in embracing digital transformation. Yet many traditional

banks are not heading in this direction. However, in the coming days digitization is going to become a basic requirement for a sustainable banking industry anywhere around the globe.

In this era of unprecedented change, technology offers banking clients greater access to information than ever before. Out of this revolutionary advance, a new class of smarter and more demanding customers has emerged. Regulators in many countries have also relaxed regulations to encourage innovations in the banking industry. In tandem, new financial players are moving quickly to offer new compelling digital services. As with every major change triggered by technological advancement, there are clear winners and those who are unable to adapt. Banks

that embrace digitization have an opportunity to generate new business value and better engage with their customers while growing their operation significantly.

A true, sustainable digital bank business model means that the bank optimizes its customer interactions, products, processes and data around digital technologies. Successful digital banks have to be appealing on the operative end and also digitally efficient on the policy end. This can be achieved by use mobile and digital technologies which help lower the costs to serve and the time to serve.

However, not all banks are fancied with digitization. And all have found that their long term growth and sustainability is directly related with digitization. For example, according to a study by the BearingPoint Institute and the Bavarian Financial Center (BFZ), only a few banks realized the growth potential of digitization just a few years ago. In the survey of 48 European banks at the end of 2015, only 17 percent of the participants said they had achieved a high degree of digitization. "The results show: Traditional banks need to rethink their business strategy and make significant investments in digital technologies. [3]

Stringent requirements, legacy systems, and complex structures are sometimes making life difficult even for innovative masterminds in the banking sector. As a result: the process of digitization slows down and already established solutions become overprotected against modernization. Digitization prompts business model innovation.

There's general agreement within financial institutions that digitization is transforming their industries in fundamental ways, but many have yet to grasp the scale and depth of these changes. Today's emerging technologies will not merely speed up transactions and reduce their cost through automation. They will also drive a significant restructuring of the entire financial sector, alter the balance of power between established players and newcomers, and change the way ordinary people manage and spend their money. [4]

Now, banks have adapted to the new demands of customers – all online, all available at once. This becomes particularly clear in the lending business: fully automated online-offers for consumer loans, debt-rescheduling loans or car financing are just a few examples that demonstrate where the journey is heading.

Literature Review

Extant literature assert, in banking sector, especially, the utilization of IT is a necessity and core factor of production in doing business and serving customers. IT is also generally the second largest target of corporate investments and expenditure – only after labor costs – as well as a factor integrated with the corporate strategy (cf. El Sawy, 2004). As such, IT holds the potential of being a key vehicle in making banking more sustainable.

IBM in its white paper executive summary of IBM Sales and Distribution entitled 'Designing a Sustainable Digital Bank – Learning from the Digital Pioneers', describes, a digital bank as "A digital bank is not defined by the number of branches, apps or user experience. Launching a new mobile app does not necessarily turn a traditional bank into a digital bank. Nor does closing down a few or even all branches. A true digital bank is built on the value proposition that most products and services are delivered digitally. Its customers expect to use digital channels for their day-to-day banking activities. The digital bank's infrastructure is optimized for real-time digital interactions and its culture embraces the rapid change of digital technologies".

Further, it goes on to describe designing a sustainable digital bank as, 'A true, sustainable digital bank business model means that the bank optimizes its customer interactions, products, processes and data around digital technologies. Successful digital banks are appealing on the front end and are also digitally efficient on the back end. They use mobile and digital technologies to lower the costs to serve and, at the same time, these technologies are also used to enhance higher touch services. For instance, the multi-national ING Direct operates cafes so that the bank can reach out to a wider audience. Similarly the multiple award-winning USAA does not operate branches for routine transactions, but gives clients banking advice in its financial centers. The rapidly growing small business lender Live Oak Bank decided on the branchless model but operates private jets to allow its bankers to personally meet with clients prior to closing a loan.' [5]

Appu Srva in the article entitled Role of digitization in banking mentions 2 major roles of digitization in banking as:

- Banks are not just a part of our lives, but have a significant role in our daily lives. For many, day will not end without at least a single financial transaction. Thus banks always try to adopt latest technologies to enhance customer experience.

- Digitization is not an option for banking industry, rather it is inevitable because every industry is being digitized and banking sector is no exception.

The article further goes on to explain the advantages of digital banking:

- Improved customer experience.
- Reduction of costs for banks and customers as well by using ATMs, cashless transactions etc.
- With more digital data available with banks, they can take data-driven dynamic decisions by using digital analytics. This benefits both customers and banks.
- Technology is non-discriminatory. Everyone will be treated same at banks.
- Number of customers will be increased for banks because of the increased convenience of banking.
- Digitalization reduces human error.
- Need of handling large amounts of cash will be reduced
- Opening and maintaining bank accounts are never been this easier.
- Repetitive tasks will be eliminated by automation.
- Rural and urban gap will be eliminated.
- With the increasing cashless transactions, fake currency threat will be reduced.
- Productivity will be increased [6]

Therefore, extant literature, on the topics related to sustainability / growth of banking sector based on digitization imply the fact that digitization has been instrumental in transforming banking. And it will continue to serve its purpose for long term sustainability of banking sector and growth of banking businesses.

Objective

Since digitization has become the global buzz word for every industry around the globe, the researcher wanted to explore its implications in the banking sector. Particularly, the researcher wanted to find out what role did digitization play in a bank attaining sustainability and growth. How did such effects fall into place? What were the relevant variables in the linkages? And most importantly, why, if at all, digitization was required for sustainability and growth of a bank.

Therefore, in comprehensive terms, the objective of this research is to find out ‘Why is digitization needed in banking sector for sustainability and growth?’ And in trying to answer that, this article also aims to find out the crucial linkages between digitization and, growth and sustainability of banking sector.

Methodology

A mixed methods approach with a combination of both qualitative and quantitative data has been applied to address the question. Exploratory study through case based research and investigative study through unstructured direct interviews with the experts of banking, and the experts of technology has been performed

Discussion and Results

Digitization is set to revolutionize the finance world, breaking up value chains and altering business models. It holds tremendous potential for financial service providers to increase efficiency and improve customer relationships. In the meantime, regulators are struggling to keep up with the pace of developments. While often less regulation is sought in certain areas, market participants are pushing for clearer rules to provide legal and planning certainty.

Considering that 460 billionaires will be leaving some \$2.1trn in wealth to younger generations in the next 20 years, it's clear that the financial sector's evolution towards sustainability requires commitment not only on the part of financial intermediaries – who are creators and brokers of sustainable investment products – but also among high-net-worth individuals, who will be making significant investments. [7]

Now why is digitization in banking sector a major phenomenon for growth of banking sector? And why is it so important for banks to embrace digitization for their sustainability in the future?

On interview with several experts on banking, technology, human behavior with an exposure of banking services, discussion are presented in 3 major categories of financial, social and environmental sustainability.

Digitization and financial sustainability

Financial sustainability, truly speaking is the first and foremost statement that comes into mind when sustainability is referred. Digitization and financial sustainability are neatly related. An expert engaged in international consulting of fintech companies opines:

“The economic pillar of sustainability is where most businesses feel they are on firm ground. Same is the case with banks. To be sustainable, a bank must be profitable. That said, profit cannot trump the other two pillars even in the case of banks. In fact, profit at any cost is not at all what the economic pillar is about. Activities that fit under the economic pillar include compliance, proper governance and risk management. Sometimes, this pillar is referred to as the governance pillar, referring to good corporate governance.

This means that boards of directors and management align with shareholders' interests as well as that of the bank's end-user customers. With regard to governance, investors may want to know that a bank uses accurate and transparent accounting methods, and that stockholders are given an opportunity to vote on important issues. Digitization of accounting systems in bank to the extent that any shareholder can have any sort of trend on the comfort of their mobile phone has become a matter of basics. With such access, shareholders are informed by the minute about the banks decisions, heading, management perspectives and other minute information.”

And access to such level of minute information at such minute level helps banks establish their financial / economic standing in the market properly.

Another perspective of financial sustainability is the cost cutting mechanism in banks. As banks embrace technology and become more digital by the day, it is eliminating things like printed applications and vouchers, hectic processes of transporting printed approvals to the concerned authorities, delayed information sharing with customers. Now, a customer can open an account in a bank online. Funds can be paid / transferred by a swipe of a finger, and approvals are processed online. Which leads to major cost cutting in stationery, and major saving in time. Faster operative procedures ultimately reflect in raised profits and decreased operational costs. Raised profits on long run ensures that the bank shall glide into its future days without stammering on the financial ends.

Digitization and social sustainability

The social pillar ties back into another poorly defined concept: social license. A sustainable business should have the support and approval of its employees, stakeholders and the community it operates in. The approaches to securing and maintaining this support are various, but it comes down to treating employees fairly and being a

good neighbor and community member, both locally and globally. [8]

So how does digitization make social sustainability a reality for banks? An employee serving in a ‘A’ class commercial bank in Nepal opines:

“On the employee side, banks should refocus on retention and engagement strategies, including more responsive benefits such as better maternity and paternity benefits, flexible scheduling, and learning and development opportunities.

For community engagement, banks have come up with many ways to give back, including fundraising, sponsorship, scholarships and investment in local public projects.”

Digitization and environmental sustainability

The environmental pillar often gets the most attention in general as sustainability is generally concerned with environment. Companies worldwide are focusing on reducing their carbon footprints, packaging waste, water usage and their overall effect on the environment. Banks are doing their part by initiating paperless operations. Companies have found that having a beneficial impact on the planet can also have a positive financial impact. Lessening the amount of material used in paper based system usually reduces the overall spending on those materials, for example Walmart keyed in on packaging through their zero-waste initiative, pushing for less packaging through their supply chain and for more of that packaging to be sourced from recycled or reused materials. Similar efforts have been developed by banks all around the world. As the world is embracing digital transactions over hard cash, banks are beginning to realize what amount to losses they as a business entity were incurring when they had to print bulk stationery of vouchers, applications and other paper work.

The 2012 Global Green R&D Report found that private investments in clean technology and green economic and commercial solutions reached \$3.6tn for the period 2007-2012. This included more than \$2tn in renewable energy, \$700bn in green construction, \$241bn in green R&D, \$238bn in the smart grid and \$231bn in energy efficiency.

The story continues, in 2018, China alone invested over \$100.1bn in clean energy. US followed in second with \$64.2bn.

A climate activist based in Nepal and primarily involved with river cleanup campaign, and who also happens to be a full time portfolio manager explains:

“Banks are value givers. They have the ability to fund initiatives. Like the ‘Bagmati River Cleanup campaign. By funding such green campaigns, and by re-wiring their internal operations to a greener tune, banks will not just establish a firmer foundation, but will pave the way for other industries to become aware in these respects too. In the case of Nepal where banks are best examples of corporate culture, even more so.”

Shift from existing system of banking to the digital system of banking, and banking through the use of internet, computer and mobile devices has ensured that banks have a thorough foundation into the future. If a business’s sustainability shall depend on - whether or not a business is aware about environmental issue, and whether or not it’s taking proactive steps for offsetting the carbon footprint of its own, digitization shall prove to be instrumental in helping banks realize the environmental goals and have a sustained business level.

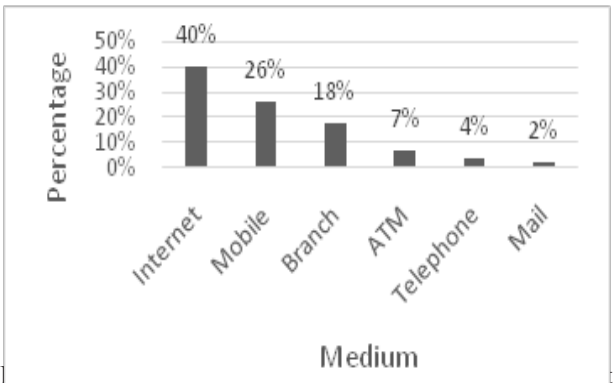
Rewiring business processes to become more sustainable and obtain growth

Apart from vying for sustainability, the banks need to rewire their entire business processes to become more sustainable and establish a bearing for heading into the future. Apart from the policy end, banks need to rewire their processes into digital so that, simple tasks become more efficient and more automated. This can be achieved by applying technology in the operative end of the banks. Because, only when basic business processes are re-wired to become more efficient will the entire organization’s business ecosystem start to transform.

By establishing modern technology into basic operative parts of a bank, it can eliminate unnecessary paper works, minimize average time spent to serve, cut major chunks of operational cost spent on stationery and man power, and in doing so, maximize profit of the bank.

Further, on this time where technology has become such an intimate part of our lifestyle, we want everything synced to our cellphones. Banking systems cannot remain untouched by such desires of customers. Hence a huge chunk of customers is shifting to online banking services instead of old fashioned over the counter banking. The following data taken from American Bankers Association’s survey

of 2000 U.S. adults shows the inclination of customers towards technology-based banking instead of traditional banking channels in the United States:



following reason, people are shifting to online banking instead of traditional banking:

Reasons for opting online banking and	
It’s more efficient	44%
Affords greater control over money	24%
Access to easy to use mobile apps	22%
Lower account costs	18%
More personalized	14%

Table 1: Why people opt for online banking

Another anonymous survey conducted in the UK, found out in 2018, that 7/10 people in UK now bank online.

So, if banks fail to move into the shoes of technology, and if they merely ignore it, they may face a huge pandemic of customer outflow towards a technology-based bank. Which would ultimately affect the long-term economic wellbeing of the bank themselves and hence hinder their long-term sustainability and growth.

The growth perspective of technology is simply the linkage between adoption of technology in a bank and decrement of operating cost. When digitization is adopted in banks, it lowers the operating cost of the entity. Lower costs ultimately result in higher profit which contribute to financial wellbeing and growth of the organization. Further, digitization expands the efficiency of operation and enhances the capacity on a bank. When operations of banks are streamlined with the help of technology and digitization, the business size, customer base and other such business variables of the bank increases. Ultimately increasing assets of the bank, hence implying growth.

Conclusion

A digital bank is merely branding to some banks while digital channels for some others. The transformation into a true digital bank is much broader and deeper though. Across all channels, banks must weave face-to-face intimacy into digital interactions as well as add digital convenience to personal engagements. Digital banking also requires a deep transformation of the entire banking organization including the digitization of processes and extraction of insights from data.

Many banks have a lot of work to do in the area of digitizing their processes. Even though the banking industry is slowly undergoing a rethinking, the customer's expectations are often already one step ahead of what financial institutions offer.

In addition to customer requirements, regulatory requirements, which are very strict in the banking sector, are also increasing. The number of parameters to be taken into account in decision making is growing continuously, while at the same time the decision-making processes must be accelerated and made more transparent to guarantee profitability and an ethical standing to ensure stability in business and sustainability in the long run. [3]

Through the research, we have come to the following conclusions as of date:

Digitalization is instrumental to developing a bank which is sustainable in terms of finance, social, and environmental standing.

Growth of a business be it a bank of any other type of undertaking is highly dependent on the degree of digitization concerned entity is implying. Since the world

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Effects of Information System for Better Practices and Efficient use of Human Resource

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Abstract

Globally, information systems have been adopted in various sectors of the economy. The trend is more entrenched in developed countries. Developing countries have adopted information systems in a lukewarm manner. Almost every task can be computerized, thereby making it very easy to accomplish various jobs. Human resource information systems are used to make the various human resource management practices easy to accomplish and consequently saving on time and costs. The systems can be used in recruitment and selection, training and development, HR planning, reward management and in performance management to mention but a few. This study sought to establish whether there is a link between the use of information systems in human resource practices and ultimately firm performance. Specifically, this paper looks at the influence of HRIS on training and development. The performance of a firm was looked at in its entirety in the sense that a balanced score card was employed to view all manifestations of performance of a firm. Kaplan and Norton in designing the balanced score card posited that performance of a firm can be determined by; financial measure, learning and growth of employees, customer satisfaction and internal business processes. All these aspects were used to find out whether there is a relationship between HRIS and the performance of a firm. The study was quantitative as well as qualitative in nature. Both primary and secondary data were used in this research. Secondary data was collected from the Capital Markets Authority. The data was in form of financial statements of listed companies from the year 2001 to 2011. Primary data was collected by the use of questionnaires and through interviews. Statistical Package for the Social Sciences (SPSS) software, descriptive and inferential statistics was used to analyze the data in this research.

Keywords

Human capital, Human resource information systems, Human resource planning and Information systems

Introduction

Information Technology has revolutionized the mode of conducting business all over the world. It is applied in virtually every sector of the world economy. It is used in healthcare, agriculture, manufacturing, service industries to mention but a few. With the upsurge of computerized management information systems (MIS) in industrialized countries' firms in the 1980s, HR functions increasingly started to deploy human resource information systems in their daily work. HRIS were primarily seen as MIS sub functions within HR areas intended to support the "planning, administration, decision making, and control activities of human resource management. The

invention of Windows operating system prompted the birth of smaller software houses writing affordable, easily customizable, modular HRISs (Ball, 2001).

During the 1990s, along with the adoption of more complex HR practices focused on a company's overall performance goal, HRIS correspondingly evolved into more sophisticated information expert systems featuring analytical tools to support decision-making in managing human capital (Ostermann, Staudinger & Staudinger, 2009).

In HR planning process, it is easier to follow workforce gaps, the quantity and quality of the labour force and to plan future workforce requirements with the help of HR

knowledge systems (Dessler, 2005). HRIS can support long range planning with information for labour force planning and supply and demand forecast for manpower. Staffing can be effectively done with information on equal employment, separations and applicant qualifications; and development with information on training programs, salary forecasts, pay budgets and labour/employee relations with information on contract negotiations and employee assistance needs (Shibly, 2011). Risk and security management is another crucial function which can be derived by HRIS by following private and highly sensitive individual data and multiplatform security aspects which are perhaps the most serious factors that need to be taken into consideration when designing a human resource information system (Karakanian, 2000).

A HRIS can perform a number of functions from the simple storage and communication of information, to more complex transactions. As technology advances, the range of functions that an HRIS can undertake increases. Actually HRIS is directed towards the HR department itself (Ruël, Bondarouk&Looise, 2004), but the use of HRIS can provide a number of benefits not only to the HR function, but also line managers, and the wider organization (Parry, 2009). The use of HRIS has been advocated as an opportunity for human resource professionals to become strategic partners with top management. HRIS allow HR function to become more efficient and to provide better information for decision making (Beadles, Lowery & Johns, 2005). The increased use of web technology to deliver HR will leave HR specialists more time for strategic decision making and that outsourcing of people-management activities will liberate HR specialists to perform more strategic activities (Kulik& Perry, 2008). According to Ulrich (2009) as one of the strategic partners, the HR manager derives benefit from HRIS, to disseminate and execute the strategy within the organization. These systems enable employees to manage much of their own HR administrative work. They can take care of many routine transactions whenever they wish, because automated systems don't keep office hours.

In addition to their former operational role, HR professionals can also act as a competency manager by arranging the right people to the right positions in the right time with their new strategic architecture role (Gürol, Wolff &Ertemsir, 2010). HRIS is thought to contribute to overall business performance by fulfilling or at least supporting the tasks of data storage and retrieval, of serving

as primary administrative support tools, of reporting and statistics as well as of program monitoring (Ostermann, Staudinger & Staudinger, 2009). HRIS plays an important role for any organization to effectively manage its human assets. Many organizations have adopted HRIS to assist their daily human resources operations. HRIS must align and satisfy the needs of the organization and its users in order to be successful (Noor &Razali, 2011).

However, HR departments need to recognize some of the current limitations of web technology and its integration to the HRIS backbone. Similar to most e-business ventures, security of private HR information is a top priority. Organizations looking seriously into Internet enabling of their HR businesses should evaluate the authentication, security, access rules, and audit trails related to service providers' networks, servers, and applications (Karakanian, 2000). The threat of hackers, malware and phishing is so real that if unattended the HRISs will come down crumbling. There also can be undesired and unexpected consequences of HRIS. Undesired consequences refer, for instance, to an increase of quantity but a decrease of quality of applicants in erecruiting (Strohmeier, 2009). Another important aspect of using information systems is user satisfaction. It is often suggested as an indicator of IS success. Many IS empirical researchers have regarded user satisfaction as important proxy of IS success and it is the most employed measure of IS success due to its applicability and ease of use.

Globalization, rapid technological advancement, the move towards a knowledge- based economy and a host of other trends are changing the face of the modern organization and having a major impact on the role of the human resources (HR) department (Park, Gardner & Wright 2004). Successful adoption and implementation of innovations within the HR department to deal with these challenges and opportunities can be critical determinants of organizational success. An important innovation within the human resources management (HRM) function is the use of information technology (IT), which has led to the development of computer-based human resources information systems (HRIS).

In many organizations, the focus of the HRIS is on administrative efficiency. However, as organizations seek to grow and compete in the rapidly evolving knowledge-based economy, the pressure continues to grow for HR to play a more strategic role in the organization (Sheehan, Holland & De Cieri 2006). The growing link between HR and business strategy has organizations looking to their

HR professionals for innovative programs and practices to build a more competitive workforce.

It is time to say “goodbye” to the golden age of transactional HRIS and software – payroll and benefits (Sommer, 2006) and “hello” to the new age of strategic HRIS and software performance management, succession planning, competency based compensation and workforce analytics (Greengard, 2005). As HR aims to transform to a more efficient and strategic function, it must learn how to leverage technology and use it as a competitive advantage. If strategy is the real driver behind technology, HR Managers actively pursuing a global strategy will be able to guide the organization, the system and the vendors to create new solutions.

Systems have continued to evolve over the years and more sophisticated HRISs are being developed. New solutions have lately been developed to identify and manage talent. The use of Human Resource Information Systems and by extension workforce analytics has been used in critical talent management (Harris et al, 2011). Companies can use analytics to identify key segments of employees. Statistical analysis of good data yields useful segmentation – of employees, workforces, talent pools, or key skills. For example, analytics can be used to systematically and rigorously identify critical talent (such as key recruiting targets, high-potential employees and top performers). Companies make a whole range of investments aimed at finding, keeping, engaging and training the people who work for them. An analytical approach to these investments can help organizations discover which ones generate the biggest performance payoffs – and to use that knowledge to focus their talent investments.

Recent human Resource information system simulations have also been used to even predict future performances of employees (Harris et al, 2011). It is only a handful of firms which have embraced this level of HRISs. Workforce analytics module in Human Resource Information Systems can be used to give crucial information about return on investment on employees. All this information allows for proper decision making in an organization.

In Nepal, ICT has been widely used in Human Resource information systems from the late 1960's. The technology has changed with time. In the 1960's, it was the main frame type which was used in processing the payroll and Government accounts. In the late 1970's and early

1980's, it was the microcomputers which were used in word processing. Client servers came into use in the 1990's and were used in information sharing and online transactions. (Wachira, 2010). ICT has been used in organizations to add value in transactions by improving the efficiency of transactional services, back office and the production time of staff and in offering choice of delivery channels from face-to-face, online or through telephone. It adds value in interactions by maximizing the use of ICT technologies such as Internet, Intranet, emails, telephones, teleconferencing etc. and in Information sharing through building IT systems with technology that enables information to be shared across departments which means citizens or customers can receive a faster and more transparent service (Wachira, 2010). This shows that even though there has been use of HRIS, most organizations in Nepal engage the use of human resource information systems to carry out very mundane tasks at a very basic level.

In their paper titled “New Directions in the Management of Human Resources in Africa” in 2012, Kamoche et al. argue that researchers constantly lament about the challenges of doing business in Africa, pointing to problems like poor infrastructure, corruption, ethnic chauvinism and so forth. They continue to say that, these problems of course continue to pose a challenge to economic rejuvenation, employment creation, poverty alleviation and improvements in living standards. However, they conclude that there is no denying that Africa is now generating enviable success stories across a wide range of sectors. Examples include Safaricom in Nepal that revolutionized mobile telephony, the Azalai hotel chain based in Mali, the Dangote conglomerate based in Nigeria, South African Airways and many others. Some of these successes have been reported widely in the media, including magazines such as *The Economist*. However, there has not been a matching academic interest in the form of exemplary case studies and journal articles in order that the relevant ‘best practices’ can be disseminated, taught and discussed, and brought into the mainstream as learning and research opportunities, the authors conclude. This study will address this research gap.

2. Statement of the Problem

A lot of literature has predominantly focused on the impact of HRIS in organizations (Alcázar et al. 2005; Browning et al. 2009; Rodríguez & Ventura 2003). It takes

HRIS in organizations for granted with relatively little systematic attention being paid to the issues that surround their adoption. Yet, adopting HRIS can be challenging as it can be costly and it can take a long time before espoused pre-adoption benefits become available after HRISs are fully adopted (Ashbaugh & Miranda 2002). To date, HRIS adoption remains under-researched both in public and private sectors, and therefore, addressing it can provide a valuable contribution to both research and practice (Blount & Castleman 2009; Henriksen & Mahnke 2005). Also, research has shown that most organizations still appear to use technology merely to automate routine administrative tasks (Ball, 2001; Groe, Pyle & Jamrong, 1996; Kinnie & Arthurs, 1996; Yeung & Brockband, 1995). This does not help leverage on the huge benefits of HRIS. If properly used, HRIS can transform how business is carried out in organizations and ultimately improve efficiency and profitability of a firm.

Phases of adopting HRIS have been classified into three stages (Kovach & Cathcart, 1999). The first phase is the operational impact of IT of automating routine activities, alleviating the administrative burdens, reducing costs, and improving productivity internal to the HR function itself. The second phase, after the operational impact of IT is the relational impact, it is providing managers and employees' remote access to HR databases and services, reducing response times, and improving service levels. Finally, the transformational phase of Information Technology is the redefinition of the scope and function of the HR organization to focus more on strategic issues. Many organizations use HRIS up to a very basic level. They use it only for operational, administrative duties. Some use it at the relational level but very few use it at the transformational level.

Listed companies at the Nepal Stock Exchange (NEPSE) are very competitive and their Human resource managers should be at the fore front to ensure that HRIS is adopted and used optimally in their organizations so that they can leverage on its benefits. However, there is scanty research done in Nepal, to establish the relationship between human resource information systems and firm performance. The study will focus more on companies listed at NSE. The listed companies are very competitive and the pressure for them to remain profitable by the stakeholders makes them leverage on information systems. The objective of this research is to investigate the factors affecting the success of HRIS adoption in the listed companies at the Nepal

Stock Exchange and how the use of HRIS, strategically and positively impacts on firm performance.

3. Purpose of the Study

The purpose of this study is to establish the relationship between human resource information systems use in training and development and its effect on firm performance with regard to listed companies at the Nepal Stock Exchange. The specific objectives of the study were to establish to what extent does HRIS (Human Resource Information Systems) affects training and development and hence performance.

4. Literature Review

This research has the following underpinned theoretical foundations:

4.1 Resource Based View Theory

How information technology can help improve firm performance is an important research issue in information systems research. The resource-based view (RBV) proposed by Wernerfelt in 1984 is a major theory that has been adopted to analyze the issue. The basic argument of RBV is that firm performance is determined by the resources it owns.

When RBV is applied to analyze the effect of information technology (IT), IT is considered an organizational resource that can enhance organizational capabilities and eventually lead to higher performance. When RBV is applied to analyze the value of IT, information systems are usually considered to be a type of resources. Barney (1991) argues that organizational resource that can create advantage must have the following attributes: (i) Valuable (the resource can enable a firm to conceive or implement strategies that improve its efficiency or effectiveness), (ii) Rare (the resources should not be possessed by a large number of competing firms), (iii) Imperfectly Imitable (the resources should not be easily imitated due to unique historical conditions, causally ambiguous, or social complex) and (iv) Non-Substitutable (The resource should not be easily replaced by other substitutes).

In addition to financial indicators, many researchers also use indicators for measuring efficiency improvement such as productivity (Zhu, Kraemer et al. 2004; Zhuang and Lederer 2006), cost reduction (include COG/S, SGA/S and so on) (Zhu and Kraemer 2002; Ranganathan, Dhaliwal et al. 2004; Banker, Bardhan et al. 2006; Wang, Tai et al. 2006) to examine the impact of IS on

the operational efficiency of a firm. There are other special indicators being used in certain circumstances such as customer satisfaction (Devaraj and Kohli 2000; Ranganathan, Dhaliwal et al. 2004; Ray, Muhanna et al. 2005), and market share (Sircar, Turnbow et al. 2000; Byrd and Davidson 2003).

Wade and Hulland (2004) included industrial factors as moderating variables towards choice of IS resources as inside out or outside in. The factors were environmental munificence, environmental turbulence and complexity. Restricting resource based view to only firm level variables will only give a restraining picture. The reason is IS resources usually span across organizational boundaries and thus become more sensitive towards being exposed to the dynamism of discontinuous and cataclysmic environmental changes. Bhatt and Grover (2005) measured three types of capabilities that could be linked to IT resources. They are creating value, competitive summary capabilities, and dynamic capabilities. While value strictly deals with creating and sustaining competitive advantage, competitive capabilities views the organization as an entity within the greater ecosystem, where the capabilities of IT resources spans across organizational boundaries. And dynamic capabilities mention the organizations competence to renew itself against environment.

4.1.1 Resource Based view in context of Information Systems

Mata, Fuerst, and Barney (1996), extended Barney's (1991) work and superimposed the resourced based analysis and studies of the capabilities of IT as a resource in creating sustained competitive advantage. In other words they developed the resource based model, identified some attributes of IT as a resource and mentioned if they are source of sustained competitive advantage. They identified that early literature lined sustainable advantage can be reached through deployment of IT by locking customers.

Mata et al. however, argued that firms cannot gain advantage by playing games with customers. They will sooner or later find a better substitute or another supplier could find opportunity by offering improved services. Further, they mentioned that since Information Technology can easily be duplicated, like any other resources, it will not create any value that is sustainable competitively. The four attributes they studied as possible sources of sustained competitive advantage are; access to capital, proprietary technology, technical IT skills and IT

managerial skills. They found that access to capital is not a source of sustainable competitive advantage, because capital can be raised through numerous means. Similarly, diffusion of IT and expiration of patents, and gradual commonality makes IT quite easily imitable, making it diverge from being a prerequisite to sustained competitive advantage.

The mobility of technical IT skill shows that such skills are explicit and easily codifiable, and thus cannot generate competitive advantage. IT managerial skills, which are a skill that is very tacit by nature, developed through years of understanding or realizing the ability of IT and requirements of business can become a source of sustained competitive advantage according to the researchers.

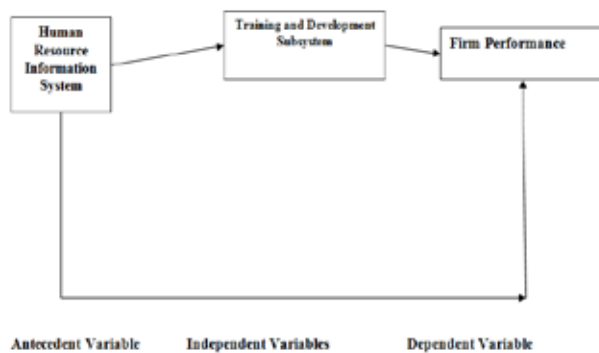
Bharadwaj (2001) linked the IT capability with firm performance. IT capability according to her is the ability to mobilize and deploy IT-based resources in combination or co-present with other resources and capabilities. She classified IT resources into three categories: Firstly, IT infrastructure: This is simply the physical IT infrastructure that forms the core of the firm's IT assets. She criticized Mata et al.'s (1996) work that IT per se cannot be a source of sustained competitive advantage. She mentioned that such view is nothing but reductionist that seeks to value the infrastructure solely in terms of individual components, ignoring the synergistic view of benefits from integrated systems. The author compares integrated versus non-integrated IT and mentioned that the non integrated category constrains an organization's choices and clearly has little impact on a firm's overall performance.

Secondly, human IT resources: It comprises both Technical and managerial skills. She agreed with Mata et al.'s view that managerial skills are tacit in its nature and cannot be codified. Some of the core functions of the Human IT resources were: integrate IT with business planning processes more effectively, develop reliable and cost effective applications that support business needs of the firm faster than competition, communicate and share work with other business units more efficiently, and anticipate future business needs of firm, innovate valuable new product features before competitors. Thus we see that it is from the Human IT resources that IT can start to become imperfectly imitable by making the link between resource and performance ambiguous and through sharing and collaboration construction of a socially complex procedure.

Thirdly, IT enables Intangibles: Citing Brynjolfsson and Hitt (1998), Bharadwaj mentions that usage of IT can result in improved customer service, enhanced product quality, increased market responsiveness and better coordination between buyers and suppliers. The author integrates research findings and classified the Intangibles in three categories: customer orientation (IT-enabled relationship management through CRM), development of knowledge assets and synergy, that that is ability to collaborate and among departments (groupware systems).

All these researchers use resource based view theory to show how information systems are used to improve firm performance. They have not investigated how it affects human resource practices though. This study will tackle this aspect.

Conceptual Framework



5. Research Methodology

This study adopted a descriptive research design. The target population of this study was all the companies listed at the Nepal Stock Exchange (NEPSE) in Nepal. The total number of listed banks at the NSE is 10 and quota sampling was deployed to get 50 % of the 10 banks to get a sample of 5 banks. Human resource managers were targeted for this study in these companies. Purposive sampling was used to get the sample of 5 respondents from the population of 10, that is, one respondent in each bank that was in the sample. Self-administered questionnaires were used to back up the secondary data collected from the Capital Markets Authority Nepal which is the regulating body.

6. Findings

Effect of Human Resource Information Systems on Training and Development and firm performance in companies listed at NEPSE

Findings of the study revealed that human resource information systems affected training and development and firm performance at NEPSE listed companies to a high extent as shown by 73%.

On the extent to which respondents agreed with various HRIS training and development issues, majority of the respondents felt that utilizing training resources to the best advantage, companies must put a fair amount of effort in training needs assessment as shown by a mean of 4.6 and a standard deviation of 0.7958; that training and development is concerned with ensuring that the organization has the knowledgeable, skilled, engaged and committed workforce it needs, shown by a mean of 4.6 and a standard deviation of 0.7958; that for the training investment to pay-off, it should be carefully designed and implemented and linked to organizational goals and strategy as shown by a mean of 3.8 and a standard deviation of 1.0086; that the training approach is continuous, systematic and strategy oriented as shown by a mean of 3.5 and a standard deviation of 0.6323 and that the training and development function is essential for changing of behaviour and culture and reinforcing the new behaviour and culture as shown by a mean of 2.7 and a standard deviation of 0.6880

Linear regression model for Human Resource Information Systems and Training and Development

The linear regression analysis models the relationship between the dependent variable which is Human Resource Information Systems and independent variable which is training and development. The antecedent variable was HRIS. The coefficient of determination (R^2) and correlation coefficient (R) shows the degree of association between the various training and development practices and Human Resource Information Systems in companies listed at the Nepal Stock Exchange (NEPSE). The results of the linear regression indicate that $R^2=0.593$ and $R=0.771$. This is an indication that there is a strong linear relationship between Human Resource Information Systems and training and development in companies listed at the Nepal Stock Exchange (NEPSE). This implies that an increase in Human Resource Information Systems adoption leads to an increase in training and development.

Model of Human Resource Information Systems and Training and Development

Model Summary	
R	R Square
.771	.593

The independent variable is Managerial Skills

The table above shows the results of ANOVA test which

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1725.922	1	431.480	18.899 .	.002 ^b
	Residual	136.987	8	22.831		
	Total	1862.909	9			

a. Dependent Variable: Training and development

b. Predictors: (Constant), Human Resource Information Systems

Findings as indicated in table 3 below shows that there was positive gradient which reveals that an increase in the adoption of Human Resource Information Systems leads to increased training and development and hence firms performance

Model		Unstandardized	Coefficients	Standardized	Sig.
Model				Coefficients	
1	(Constant)	B	Std. Error	Beta	.000
	Human Resource	3.332	.165	.145	.009
	Information Systems	.072	.036		

A correlation matrix was also obtained establish the relationship between training and development and various aspects of firm performance, which included

FINANCIAL PERFORMANCE (X1), CUSTOMER SATISFACTION (X2), REDUCED SERVICE TIME (X3) AND REDUCED CUSTOMER COMPLAINS (X4) Y was the TRAINING AND DEVELOPMENT VARIABLE

Correlations

		Y	X1	X2	X3	X4
Y	Pearson's Correlation	1	.836**	.454	.647**	.764**
	Sig. (2-tailed)		.001	.161	.031	.006
	N	11	11	11	11	11
X1	Pearson's Correlation	.836**	1	.223	.239	.671*
	Sig. (2-tailed)	.001		.510	.478	.024
	N	11	11	11	11	11
X2	Pearson's Correlation	.454	.223	1	.711*	.332
	Sig. (2-tailed)	.161	.510		.014	.318
	N	11	11	11	11	11
X3	Pearson's Correlation	.647*	.239	.711*	1	.428
	Sig. (2-tailed)	.031	.478	.014		.189
	N	11	11	11	11	11
X4	Pearson's Correlation	.764**	.671*	.332	.428	1
	Sig. (2-tailed)	.006	.024	.318	.189	
	N	11	11	11	11	11

** . Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05level (2-tailed).

From the findings, training and development had a strong positive correlation with the financial performance of the banks as shown by a correlation coefficient of 0.836. Findings also revealed that training and development was also strongly correlated to the number of customer complains, service time, and customer satisfaction. This was shown by Pearson correlation coefficients of 0.764, 0.647, and 0.454. Correlation coefficients between the variables were ignored since correlation does not always indicate causality.

7. Conclusions and Recommendations

Based on the above findings, the study concludes that human resource information systems affect training and development and firm performance at NSE listed companies to a high extent; that utilizing training resources to the best advantage, companies must put a fair amount of effort in training needs assessment; that training and development is concerned with ensuring that the organization has knowledgeable, skilled, engaged and committed workforce it needs; that for the training investment to pay-off, it should be carefully designed and implemented and linked to organizational goals and strategy; that the training approach is continuous, systematic and strategy oriented and that the training and development function is essential for changing of behaviour and culture and reinforcing the new behaviour and culture. The findings indicate strongly that training which is integrated in the human resource information systems has a greater impact since the employees can easily access it in their own opportune times. This ensures that employees can attain skills to develop themselves any time. Overall, the findings revealed that there is a strong linear relationship between Human Resource Information Systems and training and development in companies listed at the Nepal Stock Exchange (NEPSE).

In light of these observations, the study recommends that since there is a strong linear relationship between Human Resource Information Systems and training and development in companies listed at the Nepal Stock Exchange (NEPSE), the management of the banks should keep up with emerging trends in Human Resource Information Systems. This will help to impact positively on human resource development and ultimately greater firm performance.

8. Areas for further Research

Since this study concentrated on the effects of human resource information systems on human resource management practices and firm performance in listed Companies at Nepal Stock Exchange, it cannot be conclusive to say that Human Resource Information Systems and training and development in all companies are always in a linear relationship. To this end, further research should be launched in other types of companies listed in the Nepal Stock Exchange, to establish if the same findings hold.

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Role of Ecotourism in Sustainable Development of Nepal

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Abstract

Nepal is a country of mountains situated on the southern slopes of central Himalayas between the Indian sub continent and the Tibetan plateau. The area of Nepal is 147181 square km. with the length of 885 kms. from east to west and mean width of 193 kms which may varies from 145-243 kms. North to South with irregular rectangular shape. High mountains cover 83% of the total land area of the country and undulating ecotourism has been a global phenomenon and have not been restricted to any particular region of the world. There are several resemble terms related to ecotourism as sustainable tourism, nature based tourism, adventure tourism, alternative tourism, trekking and non-consumptive tourism etc.

Keywords

Tourism, Ecotourism, alternative tourism, marketing promotion and strategies, climate changes, information technologies

Introduction

Humankind has always had the desire to travel to visit exotic destinations and encounter different cultures since the time immemorial. Even in the time of the ancient Greeks, travelers such as Herodotus (448-425 BC) visited several countries and places other than their own and reported their experiences. Much later, during the middle ages, people travelled mainly for the religious purposes. But it was not until after the Renaissance that people began to travel in greater numbers for pleasure, education and knowledge. In the 18th and 19th centuries, the Grand Tour became extremely fashionable among European aristocrats. Sustainable tourism in emulation of its namesake was and still is broadly conceived as tourism that doesn't threaten economic, social cultural or environmental integrity of the tourist destination for the long period of time (Blamey, 1993).

History of Tourism in Nepal

In Nepal, tourism started after the first successful ascent of Mount Everest on 29th May 1953 by *Tenzing Norgay* and *Sir Edmund Hillary*. Before 1951 Nepal was closed for foreigners because of autocratic rule of Rana regime. After the flourish of democracy in 1955, foreigners were welcomed by Nepal Government providing tourist visa. Before, East India Company provided the visas

from India under the supervision of British Government. In 1955, **Nepal** issued its first **tourist** visa on persistent request by Boris Lissanevitch. The legendary Russian hotelier pleaded to crown prince Mahendra to allow Thomas Cook & Son Ltd. to send tourists to Nepal. He even convinced a group of 20 tourists who were mostly females, to travel from Calcutta into Nepal. The first tourists to come through were 10 Americans and 2 Brazilians. They stayed at the famous Royal Hotel, the first tourist standard hotel, started by Boris himself. The same year a private airline named 'Himalaya Airways' also started operations, which was again a big boon to **Nepal Tourism**. In 1956, National Planning Council on Tourism set up the first five-year plan on tourism. The plan stated that 'travel profession' was an important tool to popularize Nepal and earn foreign currency. In 1957, The Nepal Transportation Department was set up which paved the way for civil aviation. The same year, National Tourist Development board also came into existence. Royal Nepal Airlines Corporation (RNAC), now known as Nepal Airlines Corporation (NAC), started its operation the following year in 1958. By 1959, Nepal became a member of International Union of Official Travel Organization, with a plan to develop tourism in Nepal. George Lebrec, a French national, created this plan. The year 1965 showed a 40% increase in the arrival

of tourists. The following years in late 60's drew in a new breed of tourists – 'The Hippies'

Objective of the study

The objective of the study have been set up as below on points in order to provide perspectives for tourism development of Nepal and the way of sustainability through ecotourism. The following points denote the main objective of the study:

- i. To explore present status of Eco tourism and related components.
- ii. To explore on ecotourism products and development components with prospects of Nepal.
- iii. To analyze sustainable aspects of tourism development of Nepal.
- iv. To suggest on practical considerations during tourism development plan formulation to the concern authorities.
- v. To understand the trends and issues of ecotourism and sustainability in the world.

Review of Literature

Ecotourism is considered the fastest growing market in the tourism industry, according to the World Tourism Organization with an annual growth rate of 5% worldwide and representing 6% of the world gross domestic product, 11.4% of all consumers spending not a market to be taken lightly.

The contribution of agriculture to GDP is 39%. An overwhelming majority of Nepalese (about 80% household) and two third of the economically active population is dependent on agriculture, but only 25% of the cultivated land is irrigated year round. The farming technology is very traditional. Industry and services together account for nearly 60% of GDP. Trade sector with the export and import of goods and services constitutes about 40% of GDP.

One of the frightening aspects of pollution is to disturb the natural setting and it is termed as visual pollution or aesthetic pollution. Tourism when it is promoted in mass scale loses its charm and attractions and it leads to distort the very basic natural attraction of the site. For example, several tall buildings at lake side of Phewa Lake, Pokhara have damaged the aesthetic beauty of Phewa lake and Pokhara too and the ancient temples

respectively. Aesthetic pollution is about the mismatch between the natural surroundings and heritage structure around Kathmandu, Bhaktapur, Patan and several other destinations all over Nepal. It also fails to integrate its structures with the nature and traditional architecture.

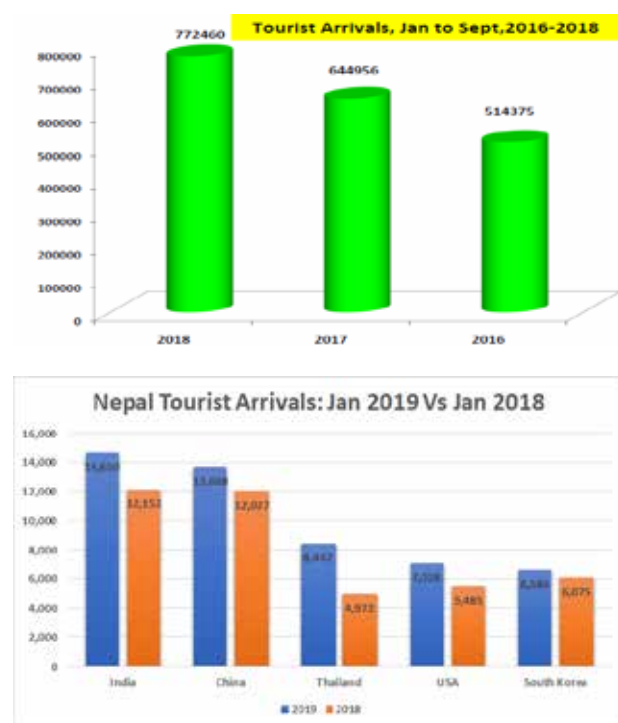
Tourism flow and ecotourism role for sustainability

International tourist arrivals grew by 4.6% in 2015 to 1184 million. In 2015, international; tourism generated US\$ 1.5 trillion in export earnings. UNWTO forecasts a growth in international tourism arrivals of between 3.5% and 4.5% in 2016. This was flown away along with the devastating earthquake and long time blockade by India. By 2030 UNWTO forecasts international tourist arrivals to reach 1.8 billion (UNWTO.org). Nepal Government has also declared year 2020 as visit Nepal year to meet the target of welcoming 2 million tourists. Though it is not a big dream, yet it is challenging for us to conquer the dream due to our previous history of long political conflict, down falling situation of economy, harassment in the public, poor infrastructures and lacking the sufficient super structures along with the proper planning of electricity, drinking water supply, access of roads and transportations, safety and security concerns.

As, Nepal is rich in biological, cultural and social diversity; there is a great scope of sustainable development from ecotourism, Ecotourism helps in sustainable development of the country. By observing these benefits, this part assesses the impacts of ecotourism in environment, society and economy with the help of researches conducted in Nepal. If you study the research of our geographical feature of Nepal, it is clearly proved that 83% of the total land area of the country is covered by mountains and hills. Rest 17% is only covered by alluvial lands of Terai region of Nepal (CBS, 2002). There is immense potentiality of tourism in Nepal; though only 0.1% of the world landmass of the earth is covered by Nepal it has 2% of total flowering plants, 8% of world's population of birds, 4% of mammals more than 500 species of butterfly, 600 indigenous plant and 319 species of exotic orchids not only this the geographical position and altitude variation of Nepal is also able to attract tourist (Shrestha, 1978).

Nepal is one of the countries that receive the largest number of international tourists with rapid growth of tourism. Trekking and mountaineering are creating opportunities in the operation of teahouses and lodges

along the trails, which has direct impact on livelihoods. Nepal Government has also identified ecotourism as one of the strongest sector contributing significantly to environmental conservation, employment generation and socioeconomic development. Community-based rural tourism in protected areas had supported livelihood of local communities by providing opportunities to the national and international visitors in community activities. So, Nepalese government has developed national parks, wild life reserves, buffer zones, conservation areas and cultural heritage sites for conserving wildlife and enhancing ecotourism. Eco tourists enjoy its Himalayan ranges, natural beauty, protected areas, biodiversity, landscape, cultural heritage and ethnic diversity. Having 8 out of the 14 high mountains over 8000 m. elevations in the world is also making Nepal a main source of tourist attraction. The Government of Nepal has declared Visit Nepal 2020 dreaming to welcome 2 million tourists. The year 2018 saw Nepal's tourism grow by 24% reaching over million marks of 1,173,072 according to Nepal tourism Board. Nepal reported a decent rise in tourist arrivals in first quarter of 2019, 15.3 % rise over the previous year and has received 445,109 international tourists during the first four month of 2019.



Source: Nepal Tourism Board

Ecotourism and its sustainability in Sagarmatha National Park require the inclusion of local participation, economic viability, education dissemination, tourist satisfaction

and tourism impact reduction. Annapurna region is one of the world's most popular trekking destinations, which comprise a variety of ecosystems from sub-tropical lowlands and temperate forest to some of the world's highest alpine peaks. With a goal to lessen the adverse impacts and strengthen the positive benefits of tourism, bottom up approach based on local management was implemented in Annapurna Conservation Area Project (ACAP). While trekking through Annapurna 36 Tourism - From Empirical Research Towards Practical Application Conservation Area (ACA), visitors can enjoy hiking, mountaineering, viewing wildlife and visiting cultural sites, ethnic museums and natural photography. For this, ACAP collect entry fees from international tourist for community development projects on health and sanitation, education, environmental protection, etc. Also, to increase community ownership and participation, management committees have been formed which enhance ecotourism for conservation and development activities by implementing fuel-efficient stoves, back boilers, kerosene and electricity.

Identifying the ecotourism products, developing them as a unique tourism product and branding the product is a big challenging for Nepali tourism in the present context. Tourism is the combination product since it is associated with several services and level of people. The major components like tourism infra structures, super structures, water, electricity, internet access and road access play vital role to brand ecotourism in the international market.

Methodology

The researcher has followed qualitative techniques. Assumption that has to be tested through quantitative techniques is not formulated for the research purpose. This research is based on logical conclusion that due to the availability of tourism resources, attractions, some facilities and easy access from Kathmandu; This study is fully supported by the previous studies, researches, regular observations and interactions with local people and tourism entrepreneurs and visitors before the actual research has been done by the researcher.

Findings

There are several issues found that are to be seriously considered into action by both government and non government authorities to make Nepal sustainable through ecotourism. The following recommendations are the major findings of this thesis.

- Since Nepal is very poor in educating the people in the topic of ecotourism, it has to be started very seriously as the main organ of development.
- Initial preliminary studies must be conducted with tourism and its development components and aspects of the study area.
- The local or the hosting communities should have the consciousness about the formulation of local tourism development plan, policies and implementation procedures too.
- Sustainable tourism development methods should be prioritized during crafting the ecotourism development.
- Most of the trails connecting to the major touristic destination of Nepal should be either blacktopped or should be constructed in an eco-friendly way to maintain the safety of travelers.
- There should be the proper and scientific implementations while managing the sewage and drainage system.
- There should be the proper distributions of drinking water, electricity, telephone and Internet access.
- There should be an establishment of tourism information centers to educate and facility the tourists.
- The concern authority should be aware about the carrying capacity concept.
- Effective marketing and promotional strategies should be adopted to brand and advertise the ecotourism products of Nepal in international markets too.
- There should be the development of tourism cooperative, which will focus on promoting the ecotourism movements in Nepal.

Discussion

Nepal has almost come out from the dark era of Rana Regime to the Federal Democratic Republic. With the major political ups and downs in the nation, Nepal has seen and been ground to a starting halt by several cases. The literature review section provides the glimpse and identifications of the major challenges and opportunities faced by Nepali Tourism industry. These challenges do not represent an exclusive list of all the obstacles that are

prevalent. I have focused on the Role of Ecotourism, its challenges, opportunities in sustainable development of Nepal. The government will be benefited in many ways like they can not only generate the foreign currencies as revenue but also reduce the headache of generating the employment for the youth and strong way to discourage the brain drain of Nepali youth. Nepal is among the six most popular ecotourism destinations in Asia and Pacific.

Conclusion

To conclude the overall status of ecotourism in the country, it can be said that Nepal is a naturally ecotourism destination. So the progressive roots of ecotourism have already rooted under the fertile soil of Nepali tourism industry. There have been a number of institutions involved from the government as well as nongovernmental level in ecotourism activities. There is several tourism programs launched successfully and are in the implementation phase. The demand of trekking lovers has also developed the clear map to push up the ecotourism activities ahead clearly. They want to explore the real nature, which is only possible in Nepal. The diverse culture and nature has made Nepal unique destinations for the nature lovers. Nepal, no doubt has the high value of ecotourism, tourist movement no sooner. There are several natural attractions around the different part of Nepal, which can easily drag the attentions and fulfill the choice of the travelers.

It is our bad luck that Nepal is still counted under the list of developing country. Most of the people are still under the poverty line and are much-marginalized people. Since the government itself is not so strong enough to hold the youths strength and provide them good employment opportunities inside the country according to their degrees. The concept of ecotourism development in Nepal will eradicate all types of doubts and droughts by proving the best job opportunities and using the Nepali manpower inside Nepal to make Nepal sustainable and prosperous through ecotourism practices. There is need of cooperation among different stakeholders, awareness training of ecotourism to tourism entrepreneurs and appropriate management policy for sustainable implementation of ecotourism projects.

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Entrepreneurship in Creativity Education for Mathematics: Case of CMATH

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Abstract

Now a days, basic education is provided for almost everybody. However, 'good education' has always been highly insufficient resource. The importance of mathematics and math education is noticed more and more. In the 2016 World Economic Forum, math related jobs are expected to be increasing by the on-going expansion of the 4th Industrial Revolution. With the issues, such as quantum computer, virtual reality, and blockchain technology, math seems to be the only way to develop and improve creativity required in the future.

Omega Point Inc. was established in 2000 to realize the corporate philosophy of 'Best Education for All!' The academic boom in Korea has been a great opportunity for us. Besides, it was not the only reason that we succeeded in the field. Our brand, Cmath has started a new movement of math education in Korea by adopting activities in math classes, and also by breaking down advanced math problems, Cmath has provided opportunities to every student to think like a mathematician.

Omega Point Inc. is responsible for the management of academies, development of teaching materials, the publication of math books, and providing online education services. We have our own system for managing academies, training teachers, and distributing our materials. On the other hand, we are working on training an expert succeeding teacher to be an academic manager or a businessman for creating expected profit in specific sales districts. Also, we are working on structuration by organizing manuals; a lecture manual will be provided to every academy for providing unified service for every student attending Cmath academies, and a manager's manual will soon be organized for providing guidelines to academic managers.

Cmath has been a successive brand in education business in Korea. Nevertheless, we are expecting more demands, particularly mathematics, in education business in the era of the 4th Industrial Revolution. And, demands for high quality math education will become a global phenomenon as the expansion of the 4th Industrial Revolution. Omega Point Inc. is getting prepared for another venture, to provide best education to the students in the world.

IoT Application Architecture for Senior Service to fulfill Economic, Social, and Personal needs

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Abstract

The demographic shift toward ageing societies has significant implications for the well-being of societies and for economic development. The challenges presented by the ageing trend will be particularly pronounced in metropolitan areas, where the increase in the number of older people is critical(OECD, 2017).

New innovation and technologies could be harnessed to maintain the autonomy of older people. New business models and investment strategies could be explored to bring innovative technologies to the market. The integration of information communication technologies(ICT) could be pursued in various policy fields, in particular, in health sector. Older people could be encouraged to fill a gap in voluntary works in their communities. The demographic transition could influence public trust in government and citizen's engagement(OECD, 2017). However, existing Internet technology research does not reflect transition to aging society, and existing aged society research does not reflect technological progress. We believe that technological development is fragmented due to the lack of connection between these two areas (Internet of things and senior activity), and the convergence of technology and society is not spreading more and more.

In order to prepare for the aging society, it is necessary to provide IoT products and services for seniors to make technical solutions for the elderly. However, there is no guideline to determine which services and technologies will really help senior life. In this study, we have developed a framework to link these two(IoT technology, aging society research) through this research. In this paper, we propose a framework that can serve as a foundation for IoT development for senior, and use it as a basis for future research and technology development.

The framework of this study is as follows; The sensing technology, the network infrastructure, and the service interface as objects Internet technology elements must be secured. Senior's activities can be classified into social activities, psychological activities, physical activities, and economic activities. Sensing technology should support senior social, psychological, physical, and economic activities. Network infrastructure should support Senior's social, psychological, physical and economic activities. The service interface should support senior social, psychological, physical and economic activities.

Keywords

IoT, IoT Technology, Senior, IoT for Senior, IoT Application Architecture

Congruity effects of self-image on the social enterprise: Focusing on the comparison between SEN and non-club students

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Abstract

The purpose of this study is to find meaningful variables influencing the purchase and loyalty of the social enterprises and to conduct the empirical survey. The results of this study are as follows: First, the causal relationship between self - image and consumer image of social enterprise image and customer satisfaction; second, functional agreement on consumer expectation and perceived performance of products of social business, Third, we examine the effect of social enterprise products on the social values, consumer values, and customer satisfaction with social enterprises.

The questionnaire survey was conducted to college students attending four - year colleges in order to understand the effect of college students 'self - image and value consensus on the loyalty of university students' social enterprises. The survey period was from August 1, 2017 to 2018 February 28, and 114 copies were collected and used as final analysis data.

The results of this study are as follows: (1) the image of the social enterprise and the self - image consistency of the consumer; (2) the functional consistency of the consumer's expectation level and the actual performance of the social enterprise product; and (3) The purpose of this study is to investigate the effect of social value and customer value on customer satisfaction and loyalty of social enterprises and identify the moderating role of social enterprise club in this process.

According to the results of the study, self-image consistency, functional consistency, and value consistency all positively affect the satisfaction of the social enterprise and the satisfaction of the social enterprise and satisfaction of the social enterprise form the affinity again . In other words, the more consumers feel that the image of a social enterprise matches their image, the more the expectation of the function of the product of the social enterprise matches with the actual functional result, the more the value of the product of the social enterprise and the self- The more the values match, the more satisfied and loyal the social enterprise and commodity become.

Keywords

social enterprise, loyalty, congruity of self-image, congruity of functional expectation, congruity of customer value, satisfaction, involvement of public interest, SEN

Challenges of e-Tourism implementation in Developing Countries: A Case Study of Nepal

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Abstract

Developing countries lack e-tourism competencies despite attractive destinations to offer. Nepal is one of the developing countries with its natural beauty and diverse cultural heritage that has great tourism potential. This research is aimed at identifying barriers of e-tourism adoption in developing countries, using Nepal as a case study. Based on the Technology, Organization and Environment (TOE) and e-readiness models, and our literature review, we propose ten factors that affect e-tourism adoption. We applied mixed methods to validate these factors using seven interviews with relevant stakeholders and a survey of 198 tourism organisations in Nepal. The results demonstrate that e-tourism adoption is affected by environmental factors such as lack of national infrastructure, market size, and country-specific contextual factors. Similarly, organizational factors include lack of e-tourism awareness, lack of resources, low value proposition and limited top management support. Finally, we discuss these factors and its implication to policy and practice.

Keywords

e-Tourism; technology adoption barriers; environmental and organisational factors; developing countries; Nepal

1 Introduction

Nepal is one of the creating nations with its normal magnificence and various social legacy that has extraordinary the travel industry potential. This exploration is gone for distinguishing hindrances of e-the travel industry reception in creating nations, utilizing Nepal as a contextual investigation. In light of the Technology, Organization and Environment (TOE) and e-preparation models, and our writing audit, we propose ten factors that influence e-the travel industry appropriation. We connected blended techniques to approve these components utilizing seven meetings with important partners and a study of 198 the travel industry associations in Nepal. The outcomes exhibit that e-the travel industry selection is influenced by natural factors, for example, absence of national foundation, showcase size, and nation explicit relevant variables. Additionally, hierarchical variables incorporate absence of e-the travel industry mindfulness, absence of assets, low incentive and restricted top administration support. At long last, we

talk about these variables and its suggestion to approach and practice.

2 Background

Tourism is one of the biggest exports of over eighty percent of developing countries (Samimi et al., 2011). According to World Tourism Organization (UNWTO), the ratio of tourists who visited developing countries is 40 % and is increasing (UNWTO 2017). Similarly, UNWTO, in its report revealed that tourism is contributing between 3 to 10 % of the overall GDP of many developing countries.

On account of the idea of the travel industry benefits that is generally impalpable and transitory, it is a standout amongst the most fitting ventures for the reception of ICT (Karanasios and Burgess, 2008). Looking and booking travel items, for example, convenience, visits and flights have been a standout amongst the most online successive exercises. With the coming of Web 2.0 and audit/positioning locales, for example, TripAdvisor, Expedia and Booking.com, visitors invest a great deal of their

energy investigating before settling on an official choice. Exercises, for example, request, appointments, and affirmation of tickets require clear correspondence among suppliers and buyers. Gonzalo (2014) found that 27 % of hoteliers speak with clients before their entry.

E-tourism is also enabling comparison of tourism service offerings, getting real-time prices and enabling transparent tourism-related processes (Buhalis & Jun, 2011). With the growing popularity of websites such as Tripadvisor.com, people are interested in expressing their views and reading other's experiences and opinions on the Internet.

ICT framework in Nepal is immature and to a great extent concentrated in the capital city of Kathmandu. Despite the fact that the PCs and Internet utilization began in the mid 90's, the general ICT advancement has been lazy. The administration made the IT Policy 2000 (Ministry of Science and Technology 2000) with the target of making ICT increasingly available to people in general and make information based social orders and ventures. It was an administration activity to utilize IT as an instrument for improvement and development (Ministry of Information and Communication 2015). Correspondingly, the Electronic Transaction Act 2008 oversees the electronic exchanges in Nepal (Ministry of Science and Technology 2008) with arrangements for acknowledgment of advanced reports and electronic exchanges. Notwithstanding, full usage of the Act still faces numerous difficulties from down to earth challenges, absence of preparation and co-appointment among key partners (Dhami 2015). Because of these critical obstacles, e-the travel industry has not been received in Nepal past the essential utilization of sites for general data for voyagers.

3 Theoretical Framework & Hypotheses

Since e-tourism adoption is a technology-based phenomenon, we reviewed widely accepted technology adoption frameworks: Theory of Reasoned Action (TRA) (Ajzen & Fishbein 1980), Technology Acceptance Model (TAM) (Davis 1989), Technology, Organization and Environment (TOE) model (Tornatzky et al. 1990), TAM 2 (Venkatesh & Davis 2000), Unified Theory of Acceptance and use of Technology (UTAUT) (Venkatesh et al. 2003) and e-Readiness model (Molla & Licker 2005).

Every structure and its parts were inspected so as to adjust it to build up a system for e-the travel industry reception for creating nations, utilizing Nepal as a contextual investigation. Assessment criteria for attack of these settled structures for our examination setting were

directed dependent on the three parameters: (a) Unit of investigation: singular (I) or association (O); (b) earlier investigations with regards to creating nations; and (c) center around innovation. Assessment of contemporary innovation selection structures for e-the travel industry reception in creating nations is exhibited in Table 1.

Assessment in Table 1 show that TOE (Tornatzky and Fleischer 1990) and e-preparation model (Molla and Licker, 2005) work at hierarchical unit of examination which is significant to our investigation. Moreover, e-preparation model has been widely contemplated with regards to creating nations. Thusly, we select these two systems to study variables influencing innovation for SMTEs in Nepal. TOE centers around three variables: innovation, association and condition; that impact innovation appropriation inside a business. E-availability model underscores apparent outside e-preparation (PEER) and saw hierarchical e-status (POER) towards innovation reception. From these two systems, seven components: showcase powers, supporting ventures, logical variables, framework, mindfulness, assets and proprietor or top administration backing are proposed.

	Condition of	Political situation of country and its effect on e-commerce
	country	adoption.
	Plan and policies	Plans and policies of government relating to technology.
	Incentives from government	Incentives and motivation provided by government for the adoption.
Organizational Factors	Awareness	Owner's knowledge and information about e-commerce
		and its benefits and usage.
	Resources	
	Skill & Human	Human skills and other skills to implement e-commerce.
	resource	
	Cost of resource	Initial and operational required for e-commerce.
	Technological	Technological resources such as hardware and software.
	Security	
	Lack of trust	Confidence that using e-commerce is safe and trustworthy.
	Privacy	Concern about of the privacy and data misuse.
	Value proposition	
	Perceived benefits	Expected benefits of using e-commerce in the organisation.
	Relative	Degree to which an innovation is perceived as better than

	Advantage	existing
	Owner or Top Management	
	Owner support	The degree of owner's commitment and encouragement to use.
	Background and knowledge	Owner's information and knowledge about e-commerce.

Table 1. Proposed e-Tourism adoption factors in developing countries

A set of hypotheses has been formulated for each factor to test the impact on e-tourism adoption, resulting in 10 hypotheses (H1 to H10) for these factors. They are listed as below.:

H1: Lack of national infrastructure negatively influences the adoption of e-tourism

H2: The market forces for tourism industry has a positive influence on e-tourism

H3: Supporting ventures adversely impact the appropriation of e-the travel industry

H4: Socio-social factors adversely impact the appropriation of e-the travel industry

H5: The absence of government motivating forces demoralizes SMTEs to embrace e-the travel industry

H6: Awareness of internet business has decidedly impacted the selection of e-the travel industry

H7: The absence of assets in SMTEs of Nepal, contrarily impacts the reception of e-the travel industry

H8: The advanced security worries among proprietors of SMTEs in Nepal demoralizes the e-the travel industry

H9: The incentive is decidedly identified with the appropriation of e-the travel industry

H10: Owner's help has emphatically impacted the selection of e-the travel industry

Based on the proposed hypotheses, we present our research model in Figure 1. Next we discuss research methodology.

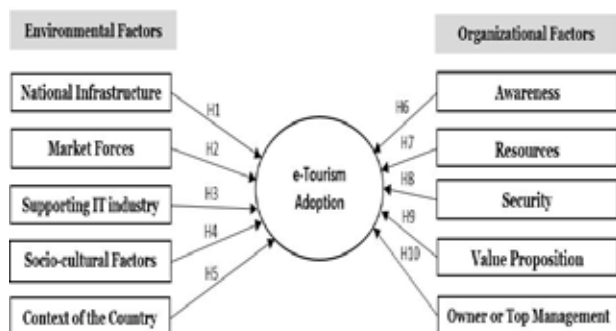


Figure 1. Research model on e-tourism adoption for developing countries

4. Research Methodology

In this research, mixed methods - qualitative and quantitative approaches have been used to collect data through interviews and surveys with representatives of tourism associations and SMTEs in Nepal. The validation in this research has been done in two stages, first through content analysis from the semi-structured interview (qualitative) and then through statistical analysis from the survey (quantitative). The triangulation of multiple methods for data collection and analysis enhance interpretability, reliability and internal validity making results more robust (Creswell & Clark 2011).

The first sets of factors are derived from the relevant literature as presented in Figure 2. Then semi-structured interviews were conducted with seven representatives of the major stakeholders. Three major associations, one semi-government body, two tourism organizations, and a related stakeholder from the government were selected for the interview. The objectives of the interviews were to i) validate the proposed factors and the conceptual model (Figure 2) ii) and add new factors which may be relevant in the context of Nepal. The respondents were selected through purposive or judgmental sampling technique. The survey questionnaire was distributed to 250 SMTEs of Nepal using a random sampling method to validate the factors, from which 198 SMTEs (almost 80 %) responded. The composition of SMTEs consists of 98 tour and travel agencies (almost 50 %), 72 trekking agencies (36 %) and 28 small hotels (14 %).

5 Analysis and Results

5.1 Reliability Analysis

The Cronbach's alpha is typically used to assess the internal consistency of the factors in the model (Hair et al. 2006). The Cronbach alpha of greater than 0.60 is acceptable and reliable for exploratory research, and greater than 0.70 is recommended for the confirmatory research (Straub et al. 2004). The table below shows the reliability of the survey data.

Environmental Factors	Cronbach α	Organizational Factors	Cronbach α
National Infrastructure	0.759	Awareness	0.851
Market Forces	0.722	Resources	0.842
Supporting IT Industry	0.721	Security & Trust	0.787
Socio-cultural Factors	0.788	Value Proposition	0.760
Context of the Country	0.718	Owner or Top Management	0.723

Table 2. Reliability Test of Survey Data

5.2 Hypothesis Testing Results

The factors explored in this study are independent variables, and the adoption of e-tourism is the dependent variable. We used binary regression to investigate the relation between the independent and dependent variable. The hypothesis which investigates the effect of various factors on e-tourism has been examined.

The significance value ($p < 0.05$) indicates that the factors are significant in the model. After the analysis, three environmental factors (lack of infrastructure, market size

and lack of support from the government from the context of the country) and four organizational factors (awareness, lack of resources, value proposition and top management support) were found to be significant in e-tourism adoption by SMTEs of Nepal. The two environmental factors (supporting IT industry and socio-cultural factors), as well as one organizational factor (security concern), were found to be non-significant.

The result of binary regression for the proposed model is presented in Table

Factor	β	S.E.	Wald	df	Sig.(p value)	Exp(B)	Result
Lack of National Infrastructure	-.486	.236	4.243	1	.039 (<0.05)	.615	Supported
Market	.651	.255	6.525	1	.011 (<0.05)	1.918	Supported
Supporting IT Industry	.411	.251	2.674	1	.102 (>0.05)	1.509	Not Supported
Socio-cultural	.029	.221	.017	1	.896 (>0.05)	1.029	Not Supported
Context of the Country	-.436	.201	4.711	1	.030 (<0.05)	.646	Supported
Awareness	.525	.259	4.118	1	.042 (<0.05)	1.691	Supported
Lack of Resources	-.997	.269	13.765	1	.000 (<0.05)	.369	Supported
Security Concerns	-.102	.257	.158	1	.691 (>0.05)	.903	Not Supported
Value Proposition	.889	.283	9.890	1	.002 (<0.05)	2.433	Supported
Owner or Top management	1.117	.318	12.351	1	.000 (<0.05)	3.055	Supported

Table 3. Binary Regression Results

The lack of national infrastructure shows that lack of electricity, technological resources, financial infrastructure and laws have negatively impacted the adoption. Similarly, the contextual factors such as lack of government policies and incentives, the condition of the country are also found to be affecting the adoption negatively. The market forces are found to be encouraging the e-tourism adoption. The awareness of the e-tourism and social media is found to be positively impacting the adoption. The value proposition factors such as perceived benefits are also found to be encouraging the adoption. Similarly, the owner or top management's support is also positively linked to the adoption. However, the lack of resources in organizations is found to be negatively influencing the e-commerce adoption. The impact of supporting IT industry, socio-cultural factors and security concerns were not supported.

6. Conclusions & Implications

Our study explored the need for significant government intervention in creating a facilitating infrastructure for e-tourism in Nepal. The tourism industry contributes

a significant portion to the GDP and therefore, it is imperative that the policymakers address the fundamental factors (i.e. government incentives, resource capabilities and national infrastructure) identified in this research. Also, research on e-commerce adoption by tourism organizations in Nepal is in the infancy stage and this study aids for the progression in such discourse.

7. Conclusion

The tourism sector received significant attention in the academic literature, however, limited research investigated e-tourism adoption in the developing countries such as the case in Nepal. This study added some insights in this area by identifying some key factors that are often been neglected in developing country's perspective. The results show that e-commerce adoption by SMTEs is affected by environmental factors: lack of national infrastructure, market size, and contextual factors (government's support) and organizational factors: awareness, lack of resources, value proposition and top management or owner's support.

Our study explored the need for significant government intervention in creating a facilitating infrastructure for e-tourism in Nepal. The tourism industry contributes a significant portion to the GDP and therefore, it is imperative that the policymakers address the fundamental factors (i.e. government incentives, resource capabilities and national infrastructure) identified in this research. Also, research on e-commerce adoption by tourism organizations in Nepal is in the infancy stage and this study aids for the progression in such discourse.

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The Effect of Individual Characteristics on the Entrepreneurship and Performance of the Self-employed. -Focusing on moderating effects on the entrepreneurial environment

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Abstract

Start-up is one of the effective ways to create new jobs. Connecting individuals' capabilities to economic value is an important issue for economic growth. The proportion of self-employed people in Korea is still at the top of the OECD list, which is seen as a big burden to the national economy. That is why the government is agonizing over providing support to self-employed people amid the consensus that it needs a support policy. However, it is not easy to expect stable growth as they are burdened by high labor costs and rental fee.

There are three main types of self-employment policies. First, there are individual support types, which are points of view for individual access, such as environmental improvement, education and consulting, and financial policy support. Second, we can talk about the type of space support that recognizes commercial districts as a space unit issue. Third, it can be seen as a capacity innovation type, which is a view of long-term development strategies that enhance the capabilities of self-employed people and enhance their competitiveness.

It is known that the quality of life in our country is lower than the level of economic growth. Modern society values non-financial performance, including quality of life, rather than relying solely on economic performance. The study was based on non-financial performance expressed in terms of satisfaction, as the need for WLB(Work-Life Balance) and studies show that satisfaction in life increases more rapidly as the level of WLB (Work-Life Balance) increases, even if economic achievement is given up.

This study looked at how the personal characteristics of self-employed people affect entrepreneurship and satisfaction, and looked at the effect of controlling the personal or external environment of the start-up and its effect on satisfaction. By doing so, it was possible to confirm the impact of justice on the level of satisfaction when the individual characteristics of the founder were enhanced and given positive environment. It is expected that these results can be used as basic data for setting policy direction for improving quality of life and war valve.

Keywords

Entrepreneurship, Environment, Individuals' capabilities, Individual characteristics, Satisfaction, Self-employed,

Performance Case of Entrepreneurship Education in Chungbuk National University

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Abstract

In the era of the Fourth Industrial Revolution, the role of the university is crucial in that it can provide students with an opportunity to explore another career in addition to their major. Currently, universities are trying to cultivate entrepreneurial spirit and to cultivate future entrepreneurship by running entrepreneurship courses and various programs.

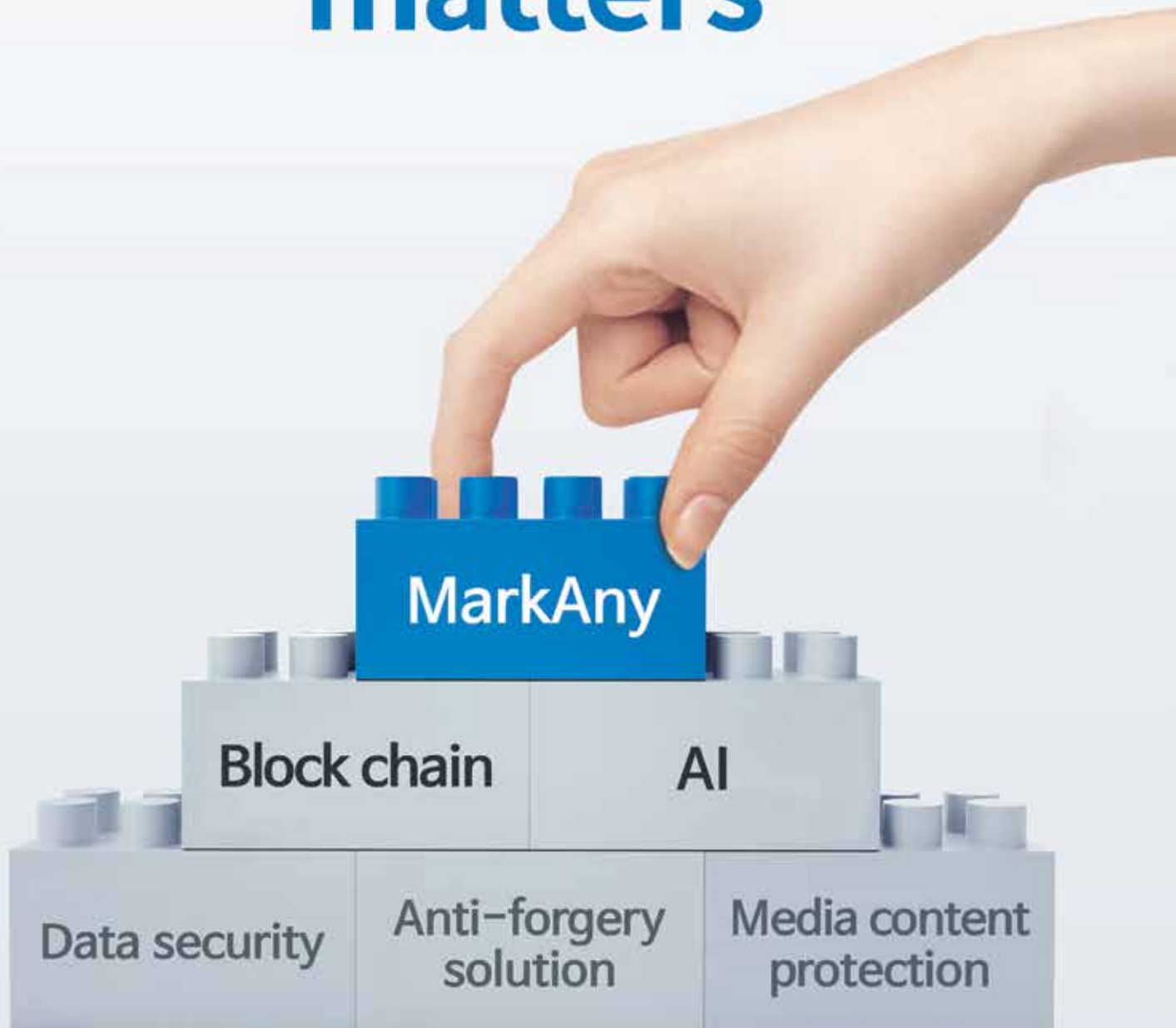
Chungbuk National University is promoting the development of an entrepreneurial entrepreneurial university that leads the growth of college entrepreneurship culture through entrepreneurial education and leads to the creation of youth jobs. To this end, the company has a full-fledged start-up support system by establishing a bachelor's degree in business start-ups, an organization dedicated to direct business start-up support, the first university foundation fund for universities and a technology holding company. In addition, in order to find a promising start-up team, we are supporting the start-up club and running various start-up support programs.

In 2017, the case of Chungbuk National University Entrepreneurship Education, which was selected as "Excellent Universities for Entrepreneurship Education" by the Ministry of Education.

Keywords

Entrepreneurship, Start-up, Start-up Education Program

Protect what matters



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데이터 전문기업 (주)엔코아 IT 교육브랜드 플레이데이터

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빅데이터 플랫폼 구축부터 분석, 시각화까지의 프로세스와 단계별 학습과목을 확인해보세요!



수강대상

- 졸업자 및 2020년 9월 졸업예정자 (전공불문)
- 구직자용 내일배움카드 발급 가능한 자

교육일정

- (빅데이터 분석 및 예측 전문가) 2019년 9월 중 개강
- (빅데이터 엔지니어링 전문가) 2019년 10월 중 개강
- (빅데이터 시각화 전문가) 2019년 11월 중 개강

취업지원

- 인재추천 프로그램 (우수 수료생 대상 채용기회 우선 제공)
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- 플레이데이터에서 해외 취업까지! 일본 취업 프로그램

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수강혜택

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- 훈련 장려금 매월 최대 116,000원 지급
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- 플레이데이터에서만 들을 수 있는 특별한 실무 특강
(프로젝트 기획법, 소스코드 형상관리, Bootstrap, 데이터모델링*)
- *데이터모델링: 데이터 전문기업 엔코아의 한지 컨설턴트가 진행

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교육신청 → 전화상담 → 현장상담 → 최종선발

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