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## Digital Transformation Opportunities & Challenges

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**A BIBLIOMETRIC ANALYSIS OF HUMAN RESOURCE MANAGEMENT IN HIGHER EDUCATION RESEARCH**

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**Abstract**

Higher education institutions (HEIs) play an increasingly important role in the social and economic development of any society. Being known as knowledge-based organizations, HEIs strongly focus on the quality of teaching and doing research to generate knowledge to the society. Thus, the quality of human resource is considered the most powerful asset for the success of HEIs and the human resource management (HRM) should get much more attention from both academics and policy makers. This article aims at systematically synthesizing the conceptual themes and the evolution HRM research in HEIs from 1966 – 2019. By using the bibliometric method to analyze 352 related publications from Scopus database, the co-word analysis of thematic networks reveals that research on HRM in HEIs tends to be related to student and teaching systems, decision-making systems, information management, societies and institutions, and sustainable development. The in-depth scrutiny of these themes also provides fruitful directions for future research regarding HRM in HEIs.

**Keywords:** *human resource management; higher education; bibliometric; co-word analysis.*

**1. INTRODUCTION**

Higher education is a tool to improve social life of a nation. A human characteristic is one of the factors affecting the quality of a civilization and the role of education, especially higher education, is to improve these characteristics (Teir and Zhang, 2016). The role of higher education is increasing under the challenge of globalization, technological development, and competition. Therefore, quality assurance in higher education is getting more and more attention from the academic community. The quality of human resources is believed to be the foundation for the success of any educational institution. HRM is considered the most powerful asset that an institution has to fit in competitive environment because human resource management transforms the organizational strategic goals into human resource policies and creates human resource strategies that could achieve a better competitive advantage. In the past three decades, strategic human resource management research (SHRM) is increasingly focused on the performance of human resource systems rather than HR practices because the effects of HRM practices are most dependent on other practices within the system (Boon *et al.*, 2019). Unlike other forms of business, universities as knowledge-based organizations strongly focus on the quality of teaching and research, which depends heavily on the quality of HRM system. Although specific HRM systems have been established and developed in the last decade in various areas (Lepak *et al.*, 2006), research on HRM systems in education is still limited (Boon *et al.*, 2019). Because of the difference of higher education, the issues that HRM systems approach at universities will also be different from traditional businesses. This study focuses on understanding the issues that HRM system is addressing at universities and future development of HRM system in HE. Co-word analysis is used to portrait the evolution HRM system research in HE because it helps us explore research themes, current research interests, conceptual structure and the evolution of HRM system in HE. The results will provide a better understanding of the research topic including major research streams, thematic evolution and future lines of research. Specifically, this study identifies the following objectives: a) to use co-word analysis to review publications on HRM in HE in Scopus database; b) to identify the conceptual structure of HRM in HE research and research steam; and c) to predict the direction of future research. This paper is divided into five sections. Following the introduction, section one introduces the literature of HRM in higher education and co-word analysis. Section two describes the process of data collection and methods. Section three focuses on descriptive statistics HRM research in HE and co-word analysis results.

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Section four focuses on discussion and indicates future lines of research. Finally, section five provides the main conclusions, identifies some limitations.

## **2. METHODOLOGY**

The term ‘bibliometrics’ is defined as the application of mathematical and statistical methods to books and the other means of communication. Bibliometric allows researchers to analyze literature of research topic to explore the conceptual structure and the evolution in research themes through different methods, such as co-citation analysis, co-word analysis, bibliographic coupling and co-authorship analysis (Leung *et al.*, 2017). This study uses a co-word analysis to review published documents about HRM in higher education. Co-word analysis is a content analysis technique based on mapping the strength of links between items in text data (de la Hoz-Correa *et al.*, 2018). Co-word analysis is based on the frequency of occurrence of two keywords in an article (Whittaker, 1989). The more keywords appear together, the greater the strength between them. Co-word analysis explores a list of the most important keywords and the interaction between keywords in the research topic (Börner *et al.*, 2003). Bibliometric map is used to visualize the research themes and detect future trends (Cobo *et al.*, 2011).

## **3. RESULTS**

This paper findings reveal that “Human resource management” (258) is the most common keywords. The top ten keywords with high frequency of occurrence are societies and institutions (59), students (56), information management (46), teaching (45), engineering education (31), knowledge management (21), curricula (21), information systems (18), project management (18), innovation (16), decision-making (16), sustainable development (15), research (14), education computing (14), human resources (14), resource allocation (14), e-learning (13), management science (12), motivation (12), natural resources management (12), information technology (11), research and development management (10), personnel management (10). Based on the criteria of the keyword and the article title, this study conducted quantitative content analysis to calculate the occurrence or number of joint recurrence of two words. To design a visual representation of keywords, the minimum frequency of each keyword is set to ten. The software used to extract the network graphs was VOSview (Waltman, 2017). In addition, to better understand the structure of conceptual sub domains of HRM in higher education, the analysis extracted five thematic clusters (see Fig. 1 and Table 1). The size of the bubble indicates the frequency of the keyword, while the thickness of the line indicates the strength of the co-occurrence of keywords. The link and the distance between two keywords identify their relationship. The colour of the bubble indicates the group in which the keyword is linked and the groups were named based on the majority of keywords belonging to them.

### ***Cluster 1. Studies regarding HRM system and societies and institutions***

This cluster comprises papers regarding combining HRM system and various systems in universities like knowledge management, information system. In addition, there are studies related to societies and institutions in this cluster.

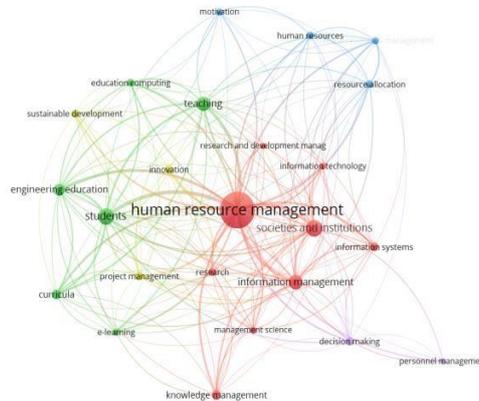
### ***Cluster 2. Studies regarding teaching and the field of application of HRM in education***

Studies in this group mainly focus on supporting students in various issues such as course advising system, scholarships eligibility checking, e-learning management systems, curricula design systems, and evaluation of the university curriculum. This cluster also includes themes relating to industry that focus on developing applications for human resource management at universities such as education computing, engineering education.

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**Fig 1:** The thematic network of HRM research in higher education

***Cluster 3. Studies on issues related to performance and motivation***

Papers included in cluster this mostly relate to the relationship between HRM and performance such as universities performance, research performance, financial performance, natural resources management, resource allocation, organizational commitment. Papers on motivation are also included as they reveal the importance of HRM systems in universities such as monthly estimation of personnel activity, e-course or research on motivation of lecturers.

**Table 1.** Groups resulting from cluster analysis of the co-word analysis on HRM research in higher education

Cluster	Keywords
Cluster 1	Information management; information systems; information technology; knowledge management; management science; research and development management; societies and institutions
Cluster 2	Curricula; e-learning; education computing; engineering education; students teaching
Cluster 3	Human resources; mottivation; natural resources managemnt; resource allocation
Cluster 4	Innovation; project management; sustainable development
Cluaster 5	Decision making; personnel management

***Cluster 4. Studies on innovation and sustainable development in universities***

This cluster comprises a group of papers linking project management with innovation and sustainable development in universities such as university-industry linkages and knowledge creation in eastern and southern Africa, innovative six course in engineering design instruction, sustainability in Swedish university and innovation strategy in China universities.

***Cluster 5. Studies on decision-making and personnel management***

Works included in this cluster explore the decision-making process and decision-making support system of administrators in various HRM issues. In addition, the studies also focused on issues in the personnel management in such as career mobility, compensation, job security, job satisfaction, work environment, human relation, job stress, occupational health.

**4. CONCLUSION**

This analysis provides a guide to researchers by improving the understanding of the conceptual structure of HRM in higher education research from academic literature and predicting the direction of future research by co-word analysis. This is the first study using co-word analysis to explore this research topic. On the basis of the papers included in Scopus database, authors can assert that research on HRM research in higher education first appeared in 1966. This research topic has broadened its focus since 1966. In this period, HRM in higher education research has witnessed an upward trend because of the emergence of many publications.

Thematic networks reveals that research on HRM in HE tends to be related to student and teaching system, and decision-making system, information management, societies and institutions, sustainable development. This implies that the HRM research in HE focus on solving problems for students with the help of technology. In addition, HRM in higher education also faces many oppotunities and challenges from issues of societies, institutions and globalization. Sustainable development and

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decision-making in university can become attractive topics in the future. From the six clusters of thematic networks extracted, clusters 2 shows an important development on the next years due to their recent discussion and interest of the academic community while cluster 5 has a lot of potential to become a major research stream in the future. However, there are some limitations due to the biases involved in an analysis of this type. Firstly, the definition of the clusters as the conceptual structure of HRM in higher education research might be biased because it depends on the author's judgment. Secondly, research results may not cover all studies of HRM in HE because of the limitations of keywords in documents. Finally, due to the limitations of co-word analysis, other methods need to be combined such as bibliographic coupling, co-citation analysis, citation analysis.

## REFERENCES

- Boon, C., Den Hartog, D. N., & Lepak, D. P., "A Systematic Review of Human Resource Management Systems and Their Measurement", *Journal of management*, (2019), <https://journals.sagepub.com/doi/full/10.1177/0149206318818718>.
- Börner, K., Chen, C., & Boyack, K. W., "Visualizing knowledge domains", *Annual review of information science and technology*, Vol. 37, No 1, (2003), pp: 179-255.
- Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F., "An approach for detecting, quantifying, and visualizing the evolution of a research field: A practical application to the fuzzy sets theory field", *Journal of informetrics*, Vol. 5, No. 1, (2011), pp: 146-166.
- de la Hoz-Correa, A., Muñoz-Leiva, F., & Bakucz, M., "Past themes and future trends in medical tourism research: A co-word analysis", *Tourism management*, Vol. 65, (2018), pp: 200-211.
- Lepak, D. P., Liao, H., Chung, Y., & Harden, E. E., "A conceptual review of human resource management systems in strategic human resource management research", *Research in personnel and human resources management*, Emerald Group Publishing Limited, (2006), pp: 217-271.
- Leung, X. Y., Sun, J., & Bai, B., "Bibliometrics of social media research: A co-citation and co-word analysis", *International journal of hospitality management*, Vol. 66, (2017), pp: 35-45.
- Teir, R., & Zhang, R.-Q., "The current practices of human resource management in higher education institutions in Palestine", *Journal of human resources management and labor studies*, Vol. 4, No. 1, (2016), pp: 65-83.
- Waltman, L., "Citation-based clustering of publications using CitNetExplorer and VOSviewer", *Scientometrics*, Vol. 111, No. 2, (2017), pp: 1053-1070.
- Whittaker, J., "Creativity and conformity in science: Titles, keywords and co-word analysis", *Social studies of Science*, Vol. 19, No. 3, (1989), pp: 473-496.

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## **SKILLS FOR BUSINESS ANALYTICS AND ACADEMIC CURRICULA**

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### **Abstract**

On the one hand digital transformation is relying on much more data and insights based on this data than ever before. On the other hand digital transformation is needed to produce this data and to make it productive. The link between the data and its use must be provided by Business Analytics or Business Intelligence. This task needs new skills and abilities and even a new culture. The paper discusses skills and abilities needed for different actors in Business Analytics, and the implication for an undergraduate academic curriculum.

**Keywords:** *analytics; data savvy manager; statistician.*

## **1. INTRODUCTION**

The huge demand for "data-savvy managers" and data scientists (Manyika *et al.*, 2011) is a challenge for businesses and for business schools. The reason for this huge demand is seen by many in the Big Data availability through today's massive data collection efforts (Chiang *et al.*, 2014; Manyika *et al.*, 2011). However, the pure fact of massive data is not a sufficient reason for the demand. Massive data does not mean massive information. The main reason for the huge demand is that businesses must be competitive in a global market and information, not data on itself, is paramount to succeed. Information needs, not only data, is the driver for the increasing demand! Often it is not even Big Data but just normal, structured data, which is the basis for actionable information. But to convert data into information it must be analysed!

A particular problem of business analytics is the naming which has been coined by different communities. While the computer science and information system communities have put more weight on the data side, coming up with denominations like "data science", the business communities knew already "business intelligence" and were happy to use "business analytics", too. The natural sciences, mathematics and statistics have long been using "data analysis" for many of the activities covered by data science. The statistics community has used "statistics" in a much more general sense than is used by most other sciences, which often have only a narrow understanding of the term "statistics".

To fix ideas we use an abbreviation by (Chiang *et al.*, 2014) who avoided at least the discussion about the distinction between Business Intelligence and Business Analytics by coining the acronym BIA for Business Intelligence and Analytics.

This article explores the need for BIA skills on the background of developing the curricula of FHNW School of Business at the undergraduate level.

## **2. BUSINESS DEMAND FOR ANALYTICAL SKILLS**

The demand of business for analytical skills is large but also varied. And it is not concentrated on the entry generation but is manifest on all levels including the elder work force. The main barriers for the correct use of information from data often are not the younger generation but managers which have acquired a lot of experience but do not know how to contrast and complement their experience with knowledge gained from data.

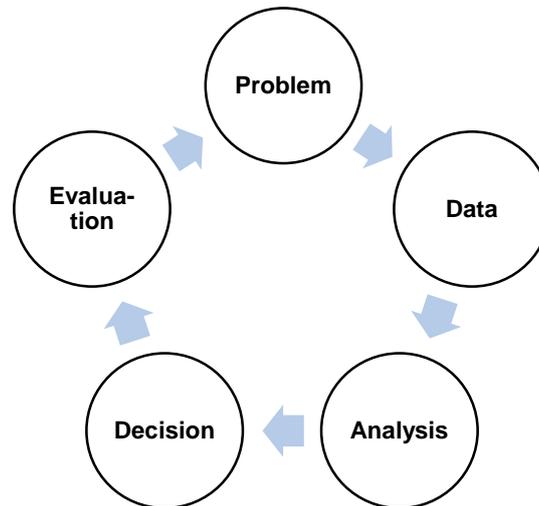
### ***BIA cycle***

A process model may help to understand the different skills needed for successful use of data in decision support. We use a model which is well aligned with Deming's PDSA (Plan-Do-Study-Act) cycle (see, e.g. Deming, 1965) with the addition of the role of data and the importance to start with a problem, i.e. not with data (Hulliger and Bill, 2014):

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**Fig. 1:** Business Analytics Cycle  
Source: Hulliger and Bill (2014)

The steps in the cycle need to be filled with more concrete activities to see what the business demand actually is.

**Problem:** The problem in BIA is a business problem. Therefore, it must be aligned with the business strategy and the objectives of the business. It needs business understanding to formulate such a problem and even to understand it fully. Often a particular functional area knowledge is needed to capture the essence of the business problem. The business problem must be cast into such terms that the quantitative aspect becomes clear and that it lends itself to studying with data.

**Data:** Collecting, procuring, organising, systematising, preparing, accessing is typically a very technically oriented set of activities which are basic in computer science and statistics. A wide knowledge about potential data sources is needed to plan a successful BIA-cycle. Getting the right data and understanding the potential and limitations of data well is key for the quality of the final information gained. The collection of data has always been a topic in statistics (surveys, experiments, observations, quality control) and now is also a topic of informatics (sensors, transaction data, customer data bases). What in computer science is often called Extract, Transform, Load (ETL) may be called data preparation, merging, editing and imputation in statistics. The essence is that data almost never is in the shape and in the quality that it can be used directly. It must be brought into a form and quality that is suitable for the analysis tasks. Sometimes it may be standardised to be held in a data warehouse but often the analysis data must be reconstructed from raw data or new data must be collected or acquired.

**Analysis:** Analysing the data through visualisation, exploration, modeling, association, in short by the full tool kit of BIA is the core of activities where most statistical and mathematical skills are needed. Without good skills in analysis tools like R, SAS, SPSS, in methods and in data analysis strategy this is a daunting task. Novices drown in the infinite number of tools and pathways and in the myriad of decisions to take along the paths. They typically underestimate the importance of keeping track of decisions and documentation. After all the results of the analysis must be reproducible to be able to discuss, correct, re-execute them. Often interactive software like Microsoft Excel does not provide this functionality. The distinction into descriptive, predictive and prescriptive analytics (Manyika et al. 2011) may be of some help but can also disguise the true nature of the activities. For example it is not only the purpose of descriptive statistics to critically assess what has occurred but also to explain which factors influenced an outcome and to what extent including a quantification of the uncertainty. Thus an important component of the analysis phase is to deal and clarify variability and uncertainty.

**Decision:** In order to make a decision based on the evidence of the analysis a proposal and alternative must be formulated. Often it is this formulation and hence the translation of the analysis into actions where the BIA process fails. The reasons are many, like lack of understanding of the limits and/or the quality of the analysis, lack of understanding the implications of variability and uncertainty, lack of capability to transfer the analysis results into the business context, lack of sufficient quantification of the consequences of actions. It becomes obvious that this crucial step needs a thorough understanding of the analysis, of the data and of the business to lead to successful actions. The implementation of a particular decision is a part of

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the decision phase. But often the actual implementation of a BIA decision is not in the hand of the team that followed the BIA process cycle and communication is essential then. It is often due to the implementation that a good decision has undesired effects. To detect and remedy this the evaluation phase is necessary.

**Evaluation:** The evaluation needs understanding of the full cycle of problem definition and planning, of data acquisition and treatment, of analysis, results, decisions and implementation. Only then the crucial question can be answered whether the initial problem is actually solved, whether at least the actions lead closer to a solution, or whether the exercise was a failure. Evaluation usually leads to a new problem formulation and is thus the beginning of a new cycle of BIA.

***A map of skills for BIA***

The skills needed for the full BIA cycle are to be characterised by the actors involved. The distinction into business, analytics, and informatics function similar to (Wilder and Ozgur, 2015) is helpful because usually BIA problems must be tackled in teams with different functions. A data scientist may be able to integrate these three functions into his/her skill set. However, it seems more realistic to assume that one person will fulfil one function or, maybe, two functions. Table 1 shows the three functions Business, Analytics, Informatics and shows what types of skills at what level are needed for the function.

Table 1 also shows which of the skills/competences would be important to a major in BIA for undergraduate students of Business Administration (BA) or Business Information Technology (BIT). It turns out that the weights may be a bit more on the technical side for BIT than for BA and more on the management side for BA than for BIT students. However, the analytical skills and the culture skills are equally important for both.

Basic statistics must be further exemplified to make the scope clear. It contains the important concepts of random variables as mathematical formulation for the mechanisms that are of interest for business problems. The formulation and quantification of the uncertainty within a model, a random variable etc. and outside the model (modeling and prediction uncertainty) must be clarified. It is important to embed the classical concepts of confidence intervals and testing into this wider field of capturing the true quality of the information gained from data.

### 3. CONCLUSION

A major in Business Intelligence and Business Analytics is a must for a business school to cope with the demand of the businesses and to keep track of the needs of doing business. The major may have a more technical orientation in BIT and may be called Business Intelligence and a more managerial orientation in BA and may be called Business Analytics. The largest lack in present curricula can be seen in the lack of overall practical training going beyond the basic statistical concepts of undergraduate studies. This means that using pocket calculators with toy examples to teach visualisation should be replaced by professional statistical software and real data. In addition the methods based course design should be replaced by a case based design for problem solving along the BIA-cycle.

**Table 1:** A characterisation of skills according to job profile

Area	Skill/Competence	Business	Analytics	Informatics	BScBA	BScBIT
<b>Business</b>	<b>Functional Area</b>	3	2	1	3	2
	<b>Management</b>	3	2	2	3	2
	<b>Strategy</b>	3	1	1	3	2
<b>Culture</b>	<b>Communication</b>	3	3	3	3	3
	<b>Project management</b>	2	2	2	2	2
	<b>Documentation</b>	1	3	3	3	3
<b>Informatics</b>	<b>Programming</b>	1	2	3	2	3
	<b>Data bases</b>	1	2	3	2	3

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	<b>ETL</b>	1	3	3	3	3
	<b>Storage</b>	1	1	3	2	3
	<b>Interfaces</b>	1	2	3	2	3
<b>Analytics</b>						
	<b>Analytics software</b>	1	3	2	3	2
	<b>Basic statistics</b>	3	3	3	3	3
	<b>Data preparation</b>	1	3	2	3	3
	<b>Visualisation</b>	2	3	1	3	3
	<b>Modeling</b>	1	3	1	3	3
	<b>Prediction</b>	1	3	1	3	3
	<b>Association</b>	1	3	1	3	3
	<b>Simulation</b>	1	3	2	3	3
	<b>Optimisation</b>	1	3	1	3	3
	<b>Risk</b>	2	3	1	3	3

\*\*Level of skill needed: 1 low level, 2 middle level, 3 high level

## REFERENCES

- Chiang, Roger H. L., Paulo Goes, and Edward A. Stohr. 2014. "Business Intelligence and Analytics Education, and Program Development." *ACM Transactions on Management Information Systems* 3 (3): 1–13. <https://doi.org/10.1145/2361256.2361257>.
- Deming, W Edwards. 1965. "Principles of Professional Statistical Practice." *The Annals of Mathematical Statistics* 36 (6): 1883–1900. <http://www.jstor.org/stable/2239137>.
- Hulliger, B, and M Bill. 2014. "Business Analytics: Nutzen Sie Ihre Daten Für Bessere Entscheidungen!" *Wirtschaftsforum Olten* . <http://web.fhnw.ch/plattformen/wirtschaftsforum/workshopunterlagen/business-analytics-b-hulliger%5Cnhttp://business-analytics-b-hulliger.pdf>.
- Manyika, J, M Chui Brown, Bughin B. J., R Dobbs, C Roxburgh, and A Hung Byers. 2011. "Big Data: The next Frontier for Innovation, Competition and Productivity." *McKinsey Global Institute*, no. June: 156. [https://bigdatawg.nist.gov/pdf/MGI\\_big\\_data\\_full\\_report.pdf](https://bigdatawg.nist.gov/pdf/MGI_big_data_full_report.pdf).
- Wilder, Coleen R., and Ceyhun O. Ozgur. 2015. "Business Analytics Curriculum for Undergraduate Majors." *INFORMS Transactions on Education* 15 (2): 180–87. <https://doi.org/10.1287/ited.2014.0134>.

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## ON THE USE OF VIRTUAL REALITY-BASED ENGINEERING EDUCATION

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### **Abstract**

Uses of virtual reality are very much increasing day-by-day in the era of science and technology. Many areas of engineering education, training, demonstration, researches and higher education using virtual reality offers more innovative and challenging opportunities. The cost of engineering education is always very high. In this area, learner improves their skills and knowledge by using the different tools, techniques and processes and reduces the cost. After improving software and hardware, tools and instruments by virtual reality the engineering education are now in easier, sophisticated way, attractive and cheaper. Here, more difficult problems like as 3D digital technologies, medical training, and military training etc. in engineering education are presented and analysed by using the implementation of virtual reality, so that the learner's get educational benefits by using virtual reality technics.

**Keywords:** *virtual reality; engineering education; training; researches; 3D digital technologies.*

## 1. INTRODUCTION

Virtual Reality (VR) is an impetuous development of technology leading to amazing change in human life. This VR technology deliver us new educational thinking and deal with difficult problems. Computerized systems provide wide variety of learning approaches such as multimedia presentations, teaching tools, realistic simulations of situations, complex question-and-answer sessions so that students can be benefitted. Besides, some of the approaches are quite costly and hazardous to bring in the classroom in reality. As a result, the usage of computers is increasing more and more as it provides better education. So, VR technologies are now developing widely and new methods are continually emerging.

The Virtual Reality engineering lab teaching system has a complete engineering method. The lab operator handles the engineering method of the classroom of different virtual environments through the controlled device. The user can experience and notice different elements at a closer range.

Students can know the better of all engineering experiments, although immersive learning, learners better immersed in their own, feel the presence of learning and fun. During the observation process, the lab operator can also be in the hands of the controller for the required observation of the engineering method to observe the beginning of the lab operator can be the best visual point of observation and learning, this is completely beyond the reach of traditional teaching methods and effects clearly. Each method with a voice introduction, the operator in the process of operation effects due to the impact of voice through immerse learning. In subtle natural learning and objectives, this part behaves as a traditional learning. Finally, by using the VR technology, engineering methods can easily be understood to all the learners. So, teachers not only can guide students to learn, but also can explain other students synchronously though the display screen using in the VR environment. Most of the engineering sectors using this classroom like as Computer engineering, Chemical engineering, Civil engineering, Mechanical engineering, Architecture engineering, etc.

In this paper, an engineering educational class is designed and developed with the VR equipment for some students and implemented for taking the class in VR environments. In the class, students wire the VR devices and feel the thrills of using the VR class room, gather the engineering knowledge more effectively and with better understanding and realization of the engineering knowhow.

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## 2. REVIEW WORKS

Virtual Reality (VR) are of two types based on the level of interaction and immersive environment and they are immersive virtual environment and non-immersive virtual environment. In immersive virtual environment, environments are presented on multiple, room-size screen i.e., through a stereoscopic, head mounted display unit. On the other hand, non-immersive virtual environment, computer simulation is represented on as the conventional personal computer and usually explored by keyboard, mouse, joystick, or touch screen [1-6]. Special hardware equipment such as gloves, suits and high-end computer system might be needed in immersive VR environment. VR computer simulation has been defined as a highly interactive, 3-D computer generated program in multimedia environment which provides the effect of immersion to the users [6]. Users are able to become a participant concrete spaces which is a computer generated version of real world objects or processes. These simulations could take many forms, ranging from computer rendering of 3-D geometric shape of highly interactive, computerized laboratory experiments [6]. There are 5 identified key properties of good VR learning experience are presented here, so that one can easily apply the appropriate Virtual Reality application for one's targeted field.

Virtual Reality experiences in education should have following properties:

- **Immersive:** Designers should strive to create the feeling that users are in an experience. For example, if one develops a medical app, make organs or bones come realistic for medical students.
- **Easy to use:** Reduce the need to have special skills to interact with a VR app.
- **Meaningful:** The VR experience must be made meaningful to students so that they can grasp the concept or idea. It would be a very good idea if the VR learning is delivered through a story. Stories quite simply provide better understanding of something.
- **Adaptable:** VR realization should allow students to explore at their own pace. The app should provide complete control over the level of difficulty. Designers should establish how students learn and then use this knowledge to design VR products that allow effective learning.
- **Measurable:** Each education tool should provide measured influence. Teacher should be able to track the metrics of education so they can measure the resulting knowledge of a subject. When designing VR experiences, it's essential to choose appropriate metrics and make it clear what criterion will be used to measure success and failure.

The aim of this work is to enhance student learning more effectively and the more engagement of the students in the class. In this process, the delivered educational content transform more properly by allowing the users to interact with it.

## 3. VIRTUAL REALITY BASED EDUCATION

Virtual Reality (VR) is a new concept where immersing people watching the display in 3D digital environment with great thrilling. One can interact with the display and receiving information by virtue of computer generated images and contents with animation. In this environment, one can feel the senses by using the sight, hearing, touch, etc. and achieve realization that is close to the real environment though it is an artificially developed and arranged environment. Virtual reality environment can be build up by using a digital 3D computer equipment and VR display equipment instead of the normal display. A simulation process for the virtual environment requires two main components and they are headsets, all-direction treadmills, special gloves, goggles, etc. These VR tools provides natural, high-quality images, more realistic and more interactive. Accuracy and better performance of these devices depend on image resolution, field of views, refresh rate, motion display, pixel persistence and audio/video synchronization. To accomplish them, they need headset, a computer smartphone, or another machine to create a digital VR environment and a motion tracking device in many cases. A headset display content before a user's eyes, while a cable (HDMI) transfers images to the screen from a computer. The other option is headsets working with smart phone, such as Google Cardboard and GearVR that is a phone act as a display and a source of VR contents. Some vendors apply lenses to change flat image into three- dimensional. Usually, a 100/110- degree field of sight is achieved with VR devices. The next key is the frame rate per second, which should be 60fps at a minimum to make virtual simulations look realistically enough.

For user interaction there are several options:

### *Head tracking*

Head tracking system in VR headsets follow the movements of your head to side and angles. It assigns X, Y, Z, axis to directions and movements, and involves tools like accelerometer, gyroscope, a circle of LEDs (around the headset to enable the outside camera). Head tracking requires low latency, i.e. 50 milliseconds or less, otherwise, users will notice the lag between head movement and a simulation.

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### ***Eye tracking***

Some headsets contain an infrared controller which tracks the decision of your eye inside a virtual environment. The major benefit of this technology is to get a more realistic and deeper field of view.

### ***Motion tracking***

Though not engineering and implemented well enough yet, motion tracking raise VR to a totally new level. The thing is, that without motion tracking you'd be limited in VR-unable to look around and move around. Through concepts of the 6DoF (six degrees of freedom) and 3D space, options to support motion tracking fall into 2 group, optical; and non-optical tracking is typically a camera on a headset to follow the movements, while non –optical means the use of other sensors on a device or a body. Most of existing devices actually combine both options.

## **4. IMPLEMENTATION AND ANALYSIS**

### ***Implemented in the classroom***

There are some methods for implementing the Virtual Reality (VR) and they are: Simulation-based VR, Project-based VR, Desktop-based VR, Head mounted display VR, Avatar Image-based VR, etc. The proposed system is based on the combination of Simulation-based VR and Head mounted display VR. To implement the virtual reality enabled class room environment 2 GB RAM, VR headset, Screen display at least 5.0 inches, Android 5.0 higher (For iPhone iOS 8 or higher), VR app- Cardboard or VeeR, Quality Headphones for Immersive Experience. VR technology has been implemented in a class room in the Computer Science and Engineering Department of the Faculty of Science and Information Technology of the Daffodil International University (DIU), Bangladesh as a test case. For that a VR device is installed and set to the students of the class. The students have enjoyed the environment and also filled thrill in the class. Without the VR device the class has been performed and enjoyed for some engineering topics on a class of students. And also the class with the VR devices in the same set of students and the same topic has been taken and measured. The engineering class with using the VR devices is found better. The implemented class environment with using the VR devices are depicted in the Fig. 1, Fig. 2 and Fig. 3.



**Fig. 1:** Students wired the VR device



**Fig. 2:** Students feel the VR class device



**Fig. 3:** VR setup class room

### ***Data analysis***

The proposed system has been implemented in a class room of the Daffodil International University which has 23 students with the VR equipment. Students using in this class are found very much excited for learning the matters and all of them are

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found very happy. Among all the students a combination of the two methods are working with the proposed method and the comparative output is presented in the following table (Table 1).

**Table 1:** Comparative output

Methods/Characteristics	Positional Tracking	Audio Input/Output	Real World Environment
Head Mounted VR	√	√	√
Simulation-based VR	√	x	√
Proposed Method	√	√	√

## 5. ADVANTAGES AND DISADVANTAGES

Some identified advantages and disadvantages are presented below.

### *Advantages*

Applications of Virtual Reality has some advantages. The identified advantages of Virtual Reality applications are presented below.

- Increase knowledge area
- Active experience rather than just passive
- Helps to understand complex concepts, subjects or theories
- No any distractions while the study
- Boosts student's creativity
- Creating interest
- Improves educational value
- Expands learner's efficiency to gain knowledge
- Outstanding visualization

### *Disadvantages*

There are also some disadvantages for the applications of Virtual Reality. The identified disadvantages of Virtual reality applications are given below.

- Lacks flexibility
- Ineffective human connections
- Getting addicted

## 6. CONCLUSIONS

A virtual reality based class room has been designed and developed for a group of students for Department of computer science and engineering department in the Daffodil International University and has been implemented for an engineering class. It is found as the doorstep of engineering education system that will change the classroom as the technologically advanced place of learning. It is realized that by using VR technology a significantly increasing student's engagement is found in learning system. This can be applied for all engineering education system where it be needed and will be appropriated.

## REFERENCES

- Polina Häfner, Victor Häfner, Jivka Ovtcharova, "Teaching Methodology for Virtual Reality Practical Course in Engineering Education", *Procedia Computer Science*, Vol.25, (2013), pp:251-260.
- Abdul-Hadi Ghazi Abulrub, Alex Attridge, Mark A Williams, "Virtual Reality in Engineering Education: The Future of Creative Learning", *International Journal of Emerging Technologies in Learning*, [Vol.6](#), No.4, (2011), pp:4-11.

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**A.Z. Sampaio, P.G. Henriques , O.P. Martins, “Virtual Reality Technology Used in Civil Engineering Education”,** The Open Virtual Reality Journal, Vol.2, (2010), pp:18-25.

[Balamuralithara Balakrishnan](#), [Peter Woods](#), “Virtual Laboratories in Engineering Education: The Simulation Lab and Remote Lab”, Computer Applications in Engineering Education, Vol.17, No.1, (2009), pp:108-118.

Majid Hashempour, Hamed Farahani Manesh, Mert Bal, “A modular virtual reality system for engineering laboratory education”, Computer Applications in Engineering Education, Vol.19, No.2, (2011), pp:305-314.

Elinda Ai-Lim Lee and Kok Wai Wong, “A review of using virtual reality for learning”, Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), (2008), pp:231-241.

Wei-Kai Liou and Chun-Yen Chang, “Virtual reality classroom applied to science education”, 2018 23rd International Scientific-Professional Conference on Information Technology, (IT), (2018), pp:1-4.

Zhao Guoliang and Meng Caiping, “The research on virtual reality applied for digitalize education of mining engineer speciality”, *ICETC 2010 - 2010 2nd International Conference on Education Technology and Computer*, Vol.2, (2010), pp: 304-306.

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**BEHAVIOURISM THEORY: APPLICATION INTO STRUCTURE OF ATOMS VIA THE USE OF EDUCATIONAL ROBOTICS (ER)**

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**Abstract**

Uses of virtual reality are very much increasing day-by-day in the era of science and technology. Many areas of engineering education, training, demonstration, researches and higher education using virtual reality offers more innovative and challenging opportunities. The cost of engineering education is always very high. In this area, learner improves their skills and knowledge by using the different tools, techniques and processes and reduces the cost. After improving software and hardware, tools and instruments by virtual reality the engineering education are now in easier, sophisticated way, attractive and cheaper. Here, more difficult problems like as 3D digital technologies

**Keywords:** *Educational Robotics (ER); behaviorism theory; operant conditioning; gamification; chemistry.*

**1. INTRODUCTION**

Technology has certainly taken over many aspects in the human society. One of the aspects that has gradually evolved through technology incorporation is the education field. This has been proven through the improvement of the classroom environment with the use of tablet computers or any smart device that has slowly replaced the traditional text book approach (Killic, 2013). In fact, during the last decade, the field of robotics has attracted numbers of teachers and researchers as one of constructivism tool to be used in classrooms. Educational robotics (ER) has benefited learning in terms of the development of cognitive and social skills from students ranged from pre-school up to higher education (Alimisis, 2013). Other than that, ER has been a tool that is able to support learning, not only for the Science (Saad, 2018) and Mathematics (Kim and Lee, 2016) subjects, but also for linguistic subject such as English (You *et al.*, 2006). Nevertheless, issues such as lack of continuous development for teachers (Barnard, 2019) are observed. In addition to this, some teachers are reluctant to learn new skills, such as programming, as they feel that it is not relevant to their daily practice in classroom. Other concerns, such as lack of knowledge in integrating ER into current syllabus of their studies and are also included. This is because they are lacking exposure in connecting the use of ER with the educational learning theories of Behaviourism Theory.

Thus, this paper aims to provide clarification on the use of educational robotics (ER) and its impact based on the learning theories of Behaviourism with a direct focus on Skinner's Operant Conditioning Theory. This aim is achievable via objectives of proposing suggestions on the activities that can be used through gamification approach via the use of ER into Chemistry subject and examining the dynamics of Behaviourism Theory and its application into Structure of Atom chapter. This paper starts off with a description on Behaviourism Theory are continued to ideas on how to integrate the use of ER into Structure of Atoms chapter.

**2. LITERATURE REVIEW**

**Behaviourism theory**

Behaviourism theory can be described as a learning process that can be obtained its outcome based on the environmental conditions that the learner are exposed to (Kay and Kibble, 2016). It is related to the observable aspects of the human behaviour. Zhou and Brown (2015) highlight behaviourism theory on the changes in behaviour that resulted from the stimulus-response relationship of the learner. It focuses on the stimuli that are given to the learner and the response given out from stimulus to the learner itself. Besides that, this theory stated that human behaviour is learned based on the observation done on the actions and human's thoughts. It focuses on the learned habits and the effort on the habits are formed. Having stated that, the main focus of this theory is the rewarded response which the learner will receive response in order for the learning process to take into place. In the education context, this theory upholds the 'rewards and punishment' system in classroom by rewarding

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desired behaviours and punishing undesired behaviour among students. The selection of the rewards varies and its selection are based on the students' stimulus and response (Rumfola, 2017).

The advocates for this theory are Watson and McLeod (2017), who define 'behaviourism' as a subject that studies on the behaviour of the human being based on the science of observable behaviour. It can be observed, recorded and measured and Watson's theory rejected the internal mental state of an individual as it cannot be observed and be subjected to any interpretation. Watson's view of the theory are based on Ivon Pavlov's classical conditioning, which studies on the conditioned stimulus and conditioned responses between sound of the bell to stimulate the salivation of a dog (McLeod, 2017). However, the works of Watson are further explored on by Skinner (1938), who proposed Operant Conditioning, which is described as a repetitive behaviour in individuals is due to positive reinforcements and negative reinforcements or rewards are less likely to be repeated among individuals.

Examples in positive reinforcement is complimenting student on their good performance, meanwhile negative reinforcement includes example such as a free homework pass for handing in all assignments. On the contrary, punishment for students has a strong stimulus to lower down the frequency of a particular response. Through the learning theories of Behaviourism Operant Conditioning Theory, students' behaviour towards learning can be promoted and changed in a positive manner.

#### ***Operant Conditioning***

Skinner (1938) stated that association between behaviour and its impact is done through operant condition. In this type of condition, learning is done through rewards and punishment for an individual's behaviour. It is based on Thorndike's law of effect which stated that response that produces a satisfying effect in any situation more likely to occur again, meanwhile response that produces a unsatisfying effect become less likely to occur again in that situation (Burke, 2001).

Thus, in the works of Skinner, the experiment involves on conditioning experiment by using mice in a conditioned environment called the 'Skinner Box'. Skinner's operant conditioning is explained further through three types of response as follows (McLeod, 2017):

- a) Neutral operant: Responses from the environment either increase or decrease the chances of behaviour being repeated.
- b) Reinforces: Responses that increases the chances of a certain behaviour to be repeated. It can either be positive or negative.
- c) Punishers: Responses from the environment that decreases the probability of a certain behaviour to repeat. This type of conditioning can decrease the moral behaviour of an individual.

For the type of response of (b), Skinner (1938) experiments on 'positive reinforcement' on hungry mice in his invention of the 'Skinner Box'. The box is described as a box with lever on the side and the when the mice move around in the box, they will unknowingly knock the lever. The 'accidental' situation leads to the drop of food pellets that would drop it to a container near to the lever attached. The drop of the food pellet will drive the mice to lean by themselves to go directly to the lever after many trials of their presence in the box. The response from this environment will allows them to get food and this situation will provoke them to repeat the action repetitively. Skinners' work has impacted many researcher to explore further on the relations between changes of human behaviour and reinforcements given in a controlled environment such as in the 'Skinner Box'. Meanwhile, negative reinforcement is described by Skinner (1938) by placing mice repetitively in the 'Skinner Box' and electrocute them with electric current that caused them to have discomfort. This condition will ensured the mice to go in a straight way towards the lever in order to switch off the electric current by the switching off the lever. Thus, the mice then learned that in order to turn off the electric current, they need to go straight towards the lever without any divert.

On the other hand, McLead (2017) stated that punishment is also a part of the operant conditioning. It can be either in the form of positive and negative punishment (Sidman, 2006). It is stated that 'punishment' is the opposite of reinforcement as it is able to decrease or remove any responses. Positive punishment can be explained in lowering the behaviour probability of a certain behaviour by inserting aversive stimulus. This type of punishment leads to the low frequency of behaviour from reoccurring. The common positive punishment is slapping as it involves pain in order to teach a student to not misbehave. In comparison, negative punishment can be defined as a punishment to decrease an inappropriate behaviour by removing a pleasurable stimulus (Crosbie, 1998). One example to explain negative punishment is by removing a student in a classroom if the student starts to misbehave. Criticism towards punishment includes its effect towards an individual's development. It might suppress a response but it does not remove any intentions in changing an undesirable behaviour. Examples of punishment include spanking a student in which leads to the feeling of guilt and fear and does not exactly teach the student the correct way of behaving. However, Gershoff (2002) supported the idea of punishment in handling discipline, especially in maintaining silence and order especially in large classrooms. Furthermore, there are still numbers of parents who believe that punishment should be continued as they were used to receive punishment during their school days (Cicognani, 2006).

Nevertheless, this theory has been applied into many fields, such as study done by Perotti *et al.* (2003) in the field of business and e-commerce. For Perotti *et al.* (2003), this theory is able to differentiate between products that are able to provide

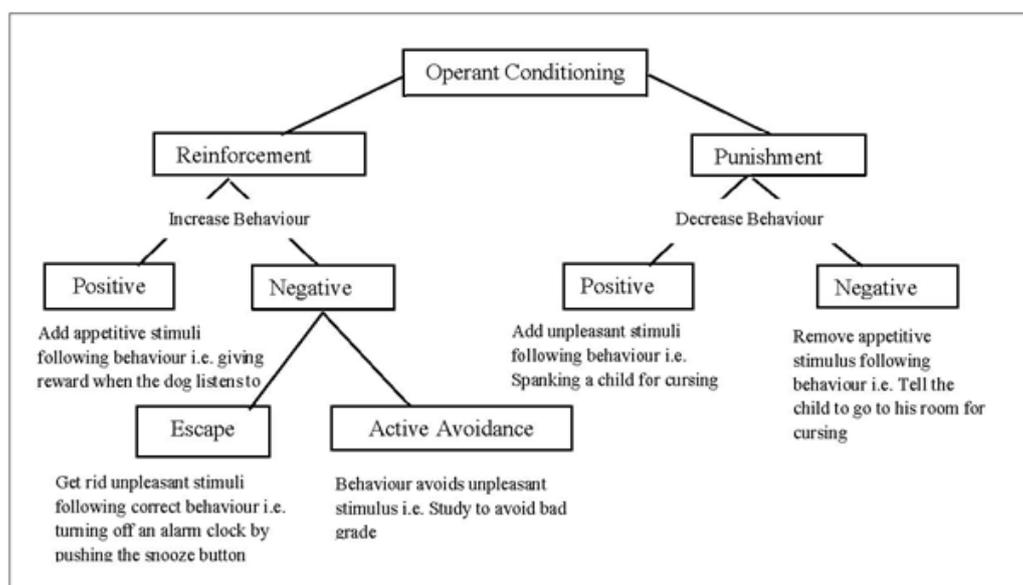
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pleasurable experiences as positive reinforcement and products that are increasing uncomfortable experience as negative reinforcement as one of the approaches in determining the behaviour of the online shoppers. From this study, the theory is able to provide the list of product that offers a positive and negative reinforcement among consumers. Besides that, this theory is applicable towards the hospitality industry in which employees who received feedback, whether negative or positive remarks from their employers exhibited positive performance among employees (Hinkin and Schrinheim, 2004).

Meanwhile, in the education context, McAllister *et al.* (1969) applied the dynamics of positive reinforcement in investigating the effects of teacher's praise with a statement of disapproving certain behaviour in classrooms as positive reinforcement as one of the approaches in changing the students' behaviour. The finding from this study demonstrated positive change towards the students' attitude especially in removing unwanted behaviour in classrooms. In fact, this theory is also applied as a foundation by the study performed by Schonewille (1970) in modifying unpleasant classroom actions by implementing punishment and positive reinforcement. The intervention proved that both intervention is found effective in lowering the frequency of students' unpleasant actions, however, positive reinforcement is more effective in reducing unpleasant action involving verbal response. Although punishment is considered as one of an effective ways in controlling behaviour among children (Parke, 2002), factors such as intensity, consistency and its impact must be put into consideration during the implementation. On the other hand, negative reinforcement in operant conditioning was investigated through the study of DiGennaro *et al.* (2005) in examining the treatment integrity among teachers from the written feedback on their performance and negative reinforcement that they received in classroom daily. Results demonstrated that the intervention has been proven to exhibit positive significance in terms of increasing the integrity of plans developed by the teachers.

Therefore, rewards or positive punishment can provide a platform for teachers in ensuring that each student conquers each concepts in the chapters of Structure of Atom. This is because each concepts in the Structure of Atom is interrelated to the subsequent chapter in the Malaysian Chemistry syllabus. Due to this notion, this learning theory is able to provide support in the design process of integrating educational robotics (ER) into the Chemistry syllabus.

The design process included rewards and punishment for each level of the activity. A summary on the Operant Conditioning Theory is illustrated in Figure 1.



**Fig. 1:** Summary of operant conditioning

Thus, dynamic of this theory is also applicable to be the foundation in designing modules to achieve the objectives of changing of behaviour among students. Literature, such as Saad (2018), applied the similar theory dynamics into his investigation of integrating ER into concepts of Krebs's Cycle in Biology subject. Variables of achievement, motivation and communication among students were investigated, where positive significance was identified. As such, this paper provides input and examples in applying ER with fundamentals of the Operant Conditioning especially Positive Reinforcement and Negative Reinforcement, which lie within the design of the gamified activities. Enforcement of concepts in the Structure of Atom chapter were designed with consideration of the application of these two theory dynamics, namely Positive and Negative

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Reinforcement to produce a change of behaviour among students in order to learn these two fundamental chapters in Chemistry subject. Scratch4Arduino (S4A) programming is used in the examples in the gamified design activity. Other programming software such as Pictoblocks are also suggested.

***Integration of Educational Robotics (ER) into syllabus***

***Example 1: Changes in the Atomic Structure concepts***

In the Atomic Structure chapter, one of the subtopics being studied in the topic is the concepts of changes in the atomic structure. Applications in the subtopic include experiments involving naphthalene, which require students to have the knowledge in constructing graphs in regards to the boiling and melting point of naphthalene. In order to do so, each stages of the graphs require students to explain on the concepts of changes in the atomic structure in terms of their kinetic energy, particle arrangement as well as the forces of attraction between the particles (Dokumen Standard Kurikulum dan Pentaksiran, 2018). In fact, one of the learning objectives in this topic requires students to plot heating and cooling curves and at the same time determine the melting and freezing points of naphthalene (Dokumen Standard Kurikulum dan Pentaksiran, 2018). However, it is observed that students are not interested to learn this topic as they felt that this topic is not relevant and does not bring any meaning to their daily life (Broman *et al.*, 2011). Thus, the need to intervene gamified activities into this topic is crucial to attract students' interest towards learning this topic. Furthermore, gamified activities planned should also include applications of naphthalene in daily life so that students can relate what they have been learning in class. Therefore, this paper proposes the following gamified activity for students to link the subtopic of naphthalene with its application in our daily life via the use of educational robotics (ER):

**BOILING POINT OF NAPHTHALENE**

**SITUATION**

Wall-E's best friend, Hal is a cockroach. They always play together and never are afar apart. Hal even likes to follow Wall-E to work. As all of you know, Wall-E works as a garbage collector and his daily tasks includes arranging the garbage collected into equal size. One day, while Wall-E is working, Hal encountered a mysterious ball. However, this ball causes Hal to be light-headed and dizzy. He concluded that mysterious ball is dangerous for him. He needs to get away from this ball, so that he can help Wall-E works. Help Wall-E's little friend to avoid this dangerous ball!



Situation of Activity: Boiling Point of Naphthalene

Figure 2: Proposed gamified robotic activity for the Boiling Point of Naphthalene subtopic

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BOILING POINT OF NAPHTHALENE

Wall-E suspected that the mysterious ball is **NAPHTHALENE**. It is a ball of chemical pest cides which can give out a pungent smell. It can kill Hal if he smells it too much! Help Hall to avoid the naphthalene balls in the field.

In this activity, students are required:

1. To identify the correct temperature of the boiling point of naphthalene
2. To move the robots in **AUTO (line tracking)** mode as Hal, the cockroach accordingly to the graph plots towards the **correct boiling point of naphthalene**
3. To answer quiz related to the topic at each correct temperature in the boiling points of naphthalene
4. To avoid any obstacles (Naphthalene)
5. To answer the questions in the answer sheet provided

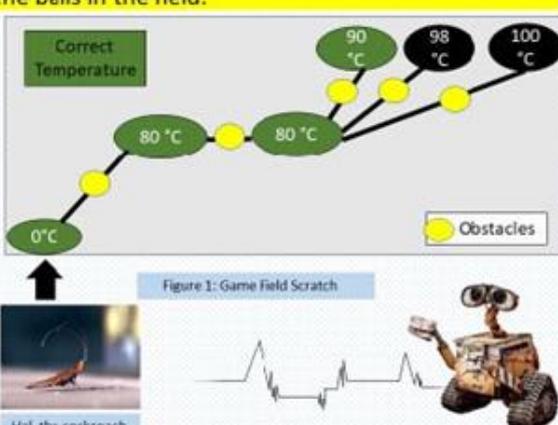


Figure 1: Game Field Scratch

Figure 3: Proposed gamified robotic activity for the Boiling Point of Naphthalene subtopic with specific instructions

In order for students to move the robots according to the instructions, they need to put into the correct codes and instruction in the Scratch4Arduino (S4A) programming. In each correct temperature points of the graph, students are given questions related to the topic and are required to answer them correctly for the robotic to move to the correct point of the graphs. If the wrong answer were given or the wrong temperature point were chosen, the students are then required to start back from the starting point of the game field. Here lies the basis of the Operant Conditioning theory used throughout the gamified robotic activity. A summary of the first example from Figure 2 and Figure 3 robotic activities with its description on the Operant Conditioning Theories are illustrated in Table 1.

Table 1: Summary of gamified robotic activities for Example 1

Item	Description
Positive Reinforcement	When the paired or grouped students are able to answer the question at each point of graphs and choose the correct points in the game field to connect the melting/boiling points of the naphthalene graph, robots will reach the end point of the game field. By doing so, points will be given to the paired/grouped of students and are added to their accumulative point of the week
Negative Reinforcement	When the paired or grouped students failed to answer the questions at the correct point, the robot will not be able to reach to correct end point of the graph. Points will be deducted from the accumulated of the week.
Positive Punishment	The paired or group of students needs to answer

Based on Table 1, it can be concluded that the gamified robotic activity designed have included the basis of Operant Conditioning into it. Through series of “reward” and “punishment” integrated into the activity designed, it can further promote students’ interest towards learning the contents in the chapters of Structure of Atoms.

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### 3. CONCLUSION

The example afore described provided suggestions on how to integrate the use of educational robotics (ER) into the Chemistry syllabus. In addition to this, it is recommended that each activity planned out with ER must include learning goals in order to have a better direction of the gamified robotic activity. Moreover, the Behaviourism Theory is able to provide a solid foundation for teachers in planning out activities and proves the flexibility of ER as a constructivism tool which can be used in classrooms. Nevertheless, the use of ER requires teachers to be creative and competent in order to integrate elements of gamification or game-based learning into the designated activities. Although they are required to add their skills in basic programming, it will benefit them in the long run.

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### REFERENCES

- Alimisis, D. (2013). Educational robotics: Open questions and new challenges. *Themes in Science and Technology Education*, 6(1), 63-71.
- Barnard, B. (2019). 6 TECHNOLOGY CHALLENGES EDUCATION IS FACING. Retrieved from <https://www.robotlab.com/blog/6-technology-challenges-education-is-facing>
- Broman, K., Ekborg, M., & Johnels, D. (2011). Chemistry in crisis? Perspectives on teaching and learning chemistry in Swedish upper secondary schools. *NorDiNa*; 1, 7.
- Burke, R. C. (2001). It's about time: Temporal representations for synthetic characters (Doctoral dissertation, Massachusetts Institute of Technology).
- Cicognani, L. (2006). To punish or Discipline? Teachers' attitudes towards the abolition of corporal punishment (Doctoral dissertation).
- Crosbie, J. (1998). Negative reinforcement and punishment. In *Handbook of research methods in human operant behavior* (pp. 163-189). Springer, Boston, MA.
- DiGennaro, F. D., Martens, B. K., & McIntyre, L. L. (2005). Increasing treatment integrity through negative reinforcement: Effects on teacher and student behavior. *School Psychology Review*, 34(2).
- Dokumen Standard Kurikulum dan Pentaksiran. (2018). Putrajaya: Malaysian Ministry of Education.
- Fernandes14, E., Fermé, E., & Oliveira, R. (2006). Using robots to learn functions in math class. *Technology Revisited*, 152.
- Gershoff, E. T. (2002). Corporal punishment by parents and associated child behaviors and experiences: a meta-analytic and theoretical review. *Psychological bulletin*, 128(4), 539.
- Hinkin, T. R., & Schriesheim, C. A. (2004). "If You Don't Hear from Me You Know You Are Doing Fine" The Effects of Management Nonresponse to Employee Performance. *Cornell hotel and restaurant administration quarterly*, 45(4), 362-372.
- Kay, D., & Kibble, J. (2016). Learning theories 101: application to everyday teaching and scholarship. *Advances in physiology education*, 40(1), 17-25.
- Killic, A. (2013). An investigation of the use of the iPad and textbooks on the achievement of students with special needs in algebra.
- Kim, S., & Lee, C. (2016). Effects of robot for teaching geometry to fourth graders. *International Journal of Innovation in Science and Mathematics Education (formerly CAL-laborate International)*, 24(2).
- McAllister, L. W., Stachowiak, J. G., Baer, D. M., & Conderman, L. (1969). THE APPLICATION OF OPERANT CONDITIONING TECHNIQUES IN A SECONDARY SCHOOL CLASSROOM I. *Journal of Applied Behavior Analysis*, 2(4), 277-285.
- McLeod, S. (2017). Behaviorism | Simply Psychology. Retrieved from <https://www.simplypsychology.org/behaviorism.html>
- Parke, R. D. (2002). Punishment revisited--Science, values, and the right question: Comment on Gershoff (2002).
- Perotti, V., Sorce, P., & Widrick, S. (2003). An exploratory study of operant conditioning theory as a predictor of online product selection. *Journal of Electronic Commerce in Organizations (JECO)*, 1(1), 42-54.
- Rumfola, L. (2017). Positive Reinforcement Positively Helps Students in the Classroom.
- Saad, M. S., Sharif, S., & Mariappan, M. (2018). Pembangunan Modul Robot Permainan Topik Respirasi Sel Menggunakan Model Addie. *International Journal of Education, Psychology and Counseling*, 3(9), 114-123

---

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---

- Schonewille, J. (1977). Modifying inappropriate classroom behaviors by punishment and positive reinforcement contingencies systems (Doctoral dissertation, Education).
- Sidman, M. (2006). The distinction between positive and negative reinforcement: Some additional considerations. *The Behavior Analyst*, 29(1), 135.
- Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. BF Skinner Foundation.
- You, Z. J., Shen, C. Y., Chang, C. W., Liu, B. J., & Chen, G. D. (2006, July). A robot as a teaching assistant in an English class. In *Sixth IEEE International Conference on Advanced Learning Technologies (ICALT'06)* (pp. 87-91). IEEE.
- Zhou, M., & Brown, D. (2015). Educational learning theories.

---

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**OVERVIEW OF MALAYSIA E-GOVERNMENT ONLINE SERVICES THROUGH BENCHMARKING APPROACH**

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**Abstract**

Over the last two decades the electronic Government (e-Government) system has been introduced in Malaysia. It was aimed for improving the delivery of public services to enable citizens to get an efficient service from the government agencies. There is large amount of budget allocation have been given by the Government to improve the delivery system. However, complaints from customers and stakeholders on the lack of alternative channels such as online services and immediate action taken to deliver services have led to dissatisfied customers. Therefore, it is crucial to ensure the effective and efficient service delivery system of public services through e-Government platform. Thus, this paper seeks to build theoretical understanding on e-Government as online portal on public service delivery in Malaysia. Previous studies revealed that towards investigating the issues of the e-Government services, it should focus on the components of e-Government itself which covers legislation, organization, information, portal, security framework, database, payment system, server and e-identification. This could be done by comparing the best practice in international standard such as in United Kingdom and Singapore. The conclusion from the literature helps understand the underlying reason of poor e-Government service delivery in Road Transport Department by looking at the best practices of e-Government. Furthermore, understanding the Malaysian culture would provide an understanding on the factors that hinder the efficient service delivery of e-Government

**Keywords:** *benchmarking; e-government, Malaysia; public service delivery.*

**1. INTRODUCTION**

Services offered by government agencies such as health services, license renewals, assessment tax payments have become important transactions for customers. Those, the rapid development of information and communication technology (ICT) has made online transaction most preferred channel to cater services to customers. The transformation of government services through the online service portal could be recognized as an improvement to better serve the taxpayer. The government is now faced with the demand of transformation and reinvention in providing services which are cost effective, efficacious and efficient manner (Sa *et al.*, 2016). While, Persson and Goldkuhl (2010) highlighted government agencies worldwide are going through a rapid process of shifting moving redefined public values, such as client centric, as well as external and internal efficiency. The services accessible via the website are the Government's dedicated approach to enhancing the public delivery system. The objective of electronic government (e-Government) is to transform the administrative process and service delivery through the use of ICT. E-Government is an initiative aimed at reinventing how the Government works and to improve the quality of interactions with citizens and businesses (Rais, 1999) through improved connectivity, better access, furnishes high quality services and better processes and systems. Seven pilot projects were introduced by the Government in an effort to drive ICT development to achieve the vision goal of 2020, which became an important agenda to bridge the gap between Malaysia and developed countries. Malaysia e-Government (Danila and Akilah, 2014) are one of the applications that has been highlighted.

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## 2. LITERATURE REVIEW

### *Definition of e-government*

The development of information and communication technology (ICT) innovations has influenced the interaction channels and communication methods between the Government and the people (Gasova and Stofkova, 2017). The use of Electronic Government (e-government) has led many countries and organization to improve effectiveness of communication and distribution channels through reducing the transaction cost and increasing the speed of service. Various literature agreed (J. Lee, 2010; Scott *et al.*, 2016; Stefanovic *et al.*, 2016) the term of e-Government has emerged in information system literature since the middle of 1990s. From an international organization perspective (OECD, 2003; UN, 2003) e-Government is defined as the use of the internet and the world-wide-web for widens and speed up delivering vital information and services which is needed by citizens from the government. Universally, e-Government can be described as the use of ICT especially the internet and the world-wide -web to further improve the efficiency, cost saving and quality of information and services. The e-government online service as a channel for service delivery is essentially different from other medium, for instance, branch networks or telephone banking, because of its interactive structure. Therefore, it brings up unique types of challenges. Danila and Akilah (2014) underline that e-Government stakeholders can be divided into two groups namely internal and external. External stakeholders include citizens and industry players. While internally involves employees and other related government departments.

### *Components of e-government*

The development of information and communication technology (ICT) innovations has influenced the interaction channels and communication methods between the Government and the people (Gasova and Stofkova, 2017). The use of Electronic Government (e-government) has led many countries and organization to improve effectiveness of communication and distribution channels through reducing the transaction cost and increasing the speed of service. Various literature agreed ( Lee, 2010; Scott *et al.*, 2016; Stefanovic *et al.*, 2016) the term of e-Government has emerged in information system literature since the middle of 1990s. From an international organization perspective (OECD, 2003; UN, 2003) e-Government is defined as the use of the internet and the world-wide-web for widens and speed up delivering vital information and services which is needed by citizens from the government. Universally, e-Government can be described as the use of ICT especially the internet and the world-wide -web to further improve the efficiency, cost saving and quality of information and services. The e-government online service as a channel for service delivery is essentially different from other medium, for instance, branch networks or telephone banking, because of its interactive structure. Therefore, it brings up unique types of challenges. Danila and Akilah (2014) underline that e-Government stakeholders can be divided into two groups namely internal and external. External stakeholders include citizens and industry players. While internally involves employees and other related government departments.

### *Components of e-government*

**Table 1:** The e-Government components by various scholars

e-Government Components	Sources
Legislation and Regulation	Rabaiah and Vandijct, 2011; Firmansyah <i>et al.</i> , 2014
Organization	Koh <i>et al.</i> , 2008; Rabaiah and Vandijct, 2011;
Information	Chutimaskul <i>et al.</i> , 2008; Koh <i>et al.</i> , 2008; Nam, 2014
Portal	Rabaiah and Vandijct, 2011; Firmansyah <i>et al.</i> , 2014
Security Framework	Rabaiah and Vandijct, 2011; Amiri <i>et al.</i> , 2012; Firmansyah <i>et al.</i> , 2014
Database	Rabaiah and Vandijct, 2011; Firmansyah <i>et al.</i> , 2014
Payment System	Rabaiah and Vandijct, 2011
Web Application Server	Kumar <i>et al.</i> , 2013; Firmansyah <i>et al.</i> , 2014
e-Identification	Rabaiah and Vandijct, 2011

### *Legislation and regulation*

In order to control and monitor activities in a country's administrative ecosystem, the regulatory framework is an essential element (Zulhuda, 2012) of the control of transactions, protection of privacy, safety, protection of intellectual property and federal policies (Alali *et al.*, 2016). To support the development of e-Government in Malaysia several acts have been developed for instance Electronic Government Activities Act 2007(EGAA). Hence, this act is a legal framework for efficient and secure

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electronic government services. While this act receives criticism and pressure from legal practitioners because of being redundant and unnecessary (Zulhuda, 2012) this paper does not intend to dispute on those articulate remarks since this paper looks into a different angle.

#### ***Organization***

The organization is an organized group of people formed to fulfil a goal that has responsibilities and authority to drive out different tasks. In this context the organization is the business owner of the relevant application developed (Rabaiah and Vandijct, 2011). They are important because they are responsible for determining the direction and decision making.

#### ***Information***

Information is an important component in a portal or website. Information will be provided to customers who access the website or application about procedures, transactions and coverage. In a review by O'Rourke and Ringer (2016), the impact on information on consumer purchase intentions has shown a significant relationship between the information displayed on the website and the consumer purchasing trends.

#### ***Portal***

The portal is usually referred as a gateway to a website. A decent portal contains informational displays such as online forums, feedback forms, dashboards and search engines to customers. A decent portal to support e-Government services should be stable and has the capacity to accommodate transactions. Kumar *et al.* (2017) highlighted portal is essential to support an efficient and sustainable e-Government growth and development system, especially for two-way communication involving transactions such as review and payment elements in research conducted in India.

#### ***Security Framework***

Security framework is an important component in the development of an e-Government application. This component will act as a protector of threatening threats in any activity when browsing the website and application. The findings of study by Abu Shanab (2014), carried out in Jordan revealed that this component is a driving force for the customers confidence to use e-Government applications. The protection of personal data and transactions are no compromise in every activity that takes place to protect the safety of consumers will expose users to cyber-attacks by irresponsible parties.

#### ***Database***

The need for a database is to provide storage for accumulation of information and data. Databases contain aggregations of data records or files for instance sales records, product catalogues and activities involve such as maintenance and customer details. So, by analogy database can be described like the inventory card catalogue in warehouse or cabinet holding cards concept respectively. Complexity of a database will be influenced by size, type of file and inventory information. The more parameters and functions required, the large and complex databases that need to be developed using specialized hardware and custom modelling techniques according to organizational approach. The development of technology has led to the advancement of innovation and the creation of new products. In the era of internet of things (IoT) the company has started investing for cloud technology (Hasheem, 2015) where its capacity can be adjusted with company operations. This innovation has also been able to eliminate the need to preserve expensive computing hardware.

#### ***Payment system***

Payment system is an operational component of the e-Government infrastructure and electronic services facilities that allow secure online payments to be implemented for the transaction required. Payment system acts as a mechanism to handle all Government payments transactions by the customers and government accounts. An electronic payment system faces various potential risks consist of internet and infrastructure security, cybercrime and intellectual property protection (Trautman, 2015).

#### ***web application server***

Server is a computer system that provides certain types of services in a computer network. The server is supported with a scalable processor and a large random access memory (RAM), also equipped with a specialized operating system, and called a network operating system. The server act as gateway controls access to the network and the resources it contains for instance the printer and provides access to the network. The server also functions as a protector to applications and databases that are configured by a connected computer using a firewall. Developing servers for e-Government services is more complicated, especially the system to be implemented is an integrated system with the relevant business model. Therefore, many aspects

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that should be analyzed not only focus on aspects of implementation costs, server security, technology used and server configuration.

#### ***E-identification***

Electronic Identification (e-Identification) is an important component tool to provide secure access to online services and to carry out electronic transactions in a safer way. With the advance of digital era technology many methods have been introduced to protect data protection and the prevention of online fraud. Most of internet-based services use such e-banking, online retails, email and e-Government applications themselves for the identification of entry control identity identities (Castro, 2011). Furthermore, this component helps reduce error and duplicating data entry. For more complex systems e-Identification uses multi-factor authentication such as personal identification number (PIN) and token for each transaction.

### **3. BENCHMARKING**

This paper also looks at best practices as benchmarking approach with other organizations that are in the same industry or service. The study has compared the practice with United Kingdom and Singapore. In UK the organization that deals with vehicle/transport and road are known as Driver and Vehicle Licensing Agency (DVLA, UK). For Singapore there are two agencies involved, they are Singapore Police Force (SPF) for issuing driving license and Land Transport Authority, Singapore (LTA) for road tax renewal. While for Malaysia, *MyEG Services Berhad's* as the Malaysian e-service provider concessionaire was taken to compare. It was done by looking at any shortcomings to ensure continuous improvement to run the organization that will deliver the outputs (Bhutta and Faizul, 1999) and achieve the goal. Generic, functional and process benchmarking are the area of benchmarking to be compared. This comparison is to give the Malaysia Road Transport Department an external focus and forces for institution to look at what its competitors are offering to serve their customers.

#### ***Driver and Vehicle Licensing Agency, UK (DVLA)***

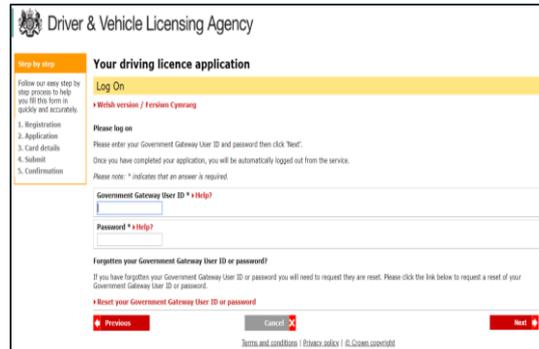
Driver and Vehicle Licensing Agency (DVLA) is an organization responsible for managing and controlling 48 million driver licenses and 40 million vehicles registration in the UK (DVLA, 2019). DVLA is an agency used for benchmarking in this paper. The DVLA selection portrayed good practices in service transformation in government. The DVLA services are exceptional as they establish admirable examples of "fully functional e-Government" (Carter *et al.*, 2016). In this respect, the DVLA have carried out a host of services such as applying and renewing driving licenses, booking driving tests, selling personalize registrations number and issuing vehicle registration certificates. This is similar to Road Transport Development in Malaysia. These services involve complex integration and adjustment of business processes and IT systems across the institution with various public and private organizations which involve financial institution vehicle dealers, insurance companies, enforcement agencies such as the police. The DVLA e-Government service represents a genuinely "transformed" public service that exceeds most typical transactional e-Government services offered by the public sector, such as paying local council tax, paying summons or applying for the housing loan. This explains the reasons for choosing the DVLA in this paper. When discussing about e-Government services implemented by DVLA, the important aspects to be considered in this paper are from the method of payment, privacy and information security, as well as type of services offered. The efficient and innovative management practiced by DVLA has enabled them to provide various service channels to customers for instance; customers can perform transactions such as renewal of licenses and pay for vehicle excise duty online by credit or debit card (DVLA, 2019).

To ensure that security aspects of the data and personal information are secure each customer who wants to conduct an online transaction needs to have a "Government Gateway User ID" as an identity and safety features. In addition, each customer will be given a notification notice through the registered email for any transaction. This method is a part of the security features practiced in order to avoid or protect the risks to customers.

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**Fig. 1:** Insight function in DVLA website  
Source: DVLA (2019)

**Singapore Police Force and Land Transport Authority, Singapore (LTA)**

Second comparisons highlighted in this paper are e-Government practice in Singapore. The United Nations E-Government Development Index (2018) has ranked Singapore as seventh from the assessed 193 country. Due to the advanced technology and exceptional interest in Research and Development (R & D) since three decades ago, Singapore has built up a stature as a regional technology-hub and has developed the ambition to become the world leader in e-Government (Ha and Coghill, 2008). In Singapore, the agency responsible for the issuance of driving license and vehicle registration is divided into two agencies namely the Singapore Police Force and the Land Transport Authority, Singapore (LTA), which is different from Malaysia and the UK where the agency dealing with such matters is Road Transport Department and DVLA respectively. Through investment in technology, these two agencies provide services to online users for core services such as renewal of road tax, number plate registration and exchange of details in the driver license. While in Singapore, other than providing online services to citizens, customers can still get services either at the Singapore post outlet or AXS kiosk located at strategic locations (LTA, 2018). This facility is available to accommodate customers who choose to deal with brick-and-mortar or conventional methods.



**Fig.2:** Alternative channel to renewal road tax in Singapore

Only the first word in a title must be capital and other word should be in small case. Author details must not show any professional title (e.g. Managing Director), any academic title (e.g. Dr.) or any membership of any professional organization (e.g. Senior Member IEEE).

To avoid confusion, the family name must be written as the last part of each author name (e.g. John A.K. Smith). Each affiliation must include, at the very least, the name of the company and the name of the country where the author is based (e.g. Causal Productions Pty Ltd, Australia). Email address is compulsory for the corresponding author.

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#### 4. CONCLUSION AND THE WAY FORWARD

Detailed Through the literature review discussed, various efforts to modernize the public service delivery system have been initiated since the late 90s. Investments in information systems (IS) and ICT require significant value to provide a positive impact on image and organization performance. The impact cannot be harvested in a short period of time but requires continuous effort and improvement from time to time. The use of e-government and its benefits have proved to be of value to enhance delivery of services to the public. This paper has demonstrated that having an efficient e-Government online service is vital for the organization to face the rapidly changing business environment. The e-government components that has been identified and compared through benchmarking approach with United Kingdom and Singapore would help to better understand the issues and challenges faced by the Malaysia government. This challenges needs to look from various stakeholders' involvement such as financial institution, consumer as citizens, public administrators, design and IT developers, as well as suppliers.

#### ACKNOWLEDGEMENT

This paper presents an initial effort toward improving the public service using e-government in Road Transport Department, Malaysia using benchmarking cross-country. It is therefore enables better decision-making ability to stakeholders.

#### REFERENCES

- Abu-Shanab, E. (2014). Antecedents of trust in e-government services: an empirical test in Jordan. *Transforming Government: People, Process and Policy*, 8(4),480-499.
- Alali, H., Wishah, R., Alali, S., Al-Sukkar, A., & Abu-Hussien, A. H. (2016). E-Marketplace Legal And Regulatory Framework In Jordan: A General View. *Journal of Theoretical & Applied Information Technology*, 85(2).
- Amiri, M. P., & Amiri, A. P. (2012). Evaluating Success Factors on E-banking Implementation: a Fuzzy MCDM Application. *Trends in Applied Sciences Research*, 7(4), 303-313.
- Bhutta, K. S., & Huq, F. (1999). Benchmarking–best practices: an integrated approach. *Benchmarking: An International Journal*, 6(3), 254-268.
- Carter, L., Weerakkody, V., Phillips, B., & Dwivedi, Y. K. (2016). Citizen adoption of e-government services: Exploring citizen perceptions of online services in the United States and United Kingdom. *Information Systems Management*, 33(2), 124-140.
- Castro, D. (2011). Explaining International Leadership: Electronic Identification Systems. Information Technology and Innovation Foundation.
- Chutimaskul, W., Funilkul, S., & Chongsuphajaisiddhi, V. (2008). The quality framework of e-government development. In *Proceedings of the 2nd international conference on Theory and practice of electronic governance* (pp. 105-109). ACM.
- Danila, R., & Abdullah, A. (2014). User's Satisfaction on E-government Services: An Integrated Model. *Procedia-Social and Behavioral Sciences*, 164, 575-582.
- Driver and Vehicle Licensing Agency (DVLA), UK (2019). About DVLA, UK. Retrieved from: <https://www.gov.uk/government/organisations/driver-and-vehicle-licensing-agency/about#who-we-are>
- Firmansyah, G., Hasibuan, Z. A., & Sucahyo, Y. G. (2014, November). Indonesia e-Government components: A principal component analysis approach. In *Information Technology Systems and Innovation (ICITSI), 2014 International Conference on* (pp. 148-152). IEEE.
- Gasova, K., & Stofkova, K. (2017). E-Government as a Quality Improvement Tool for Citizens' Services. *Procedia engineering*, 192, 225-230.
- Ha, H., & Coghill, K. (2008). E-government in Singapore-a SWOT and PEST analysis. *Asia-Pacific Social Science Review*, 6(2), 103-130.
- Hashem, I. A. T., Yaqoob, I., Anuar, N. B., Mokhtar, S., Gani, A., & Khan, S. U. (2015). The rise of “big data” on cloud computing: Review and open research issues. *Information systems*, 47, 98-115.
- Koh, C. E., Prybutok, V. R., & Zhang, X. (2008). Measuring e-government readiness. *Information & management*, 45(8), 540-546.

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*Digital Transformation – Opportunities and Challenges*

---

- Kumar, A. S., Jayarao, G., Nayak, B. S., & Durga, K. (2013). A Model for Component Based E-governance Software Systems. *International Journal of Application or Innovation in Engineering & Management*, ISSN, 2319-4847.
- Kumar, R., Sachan, A., & Mukherjee, A. (2017). Qualitative approach to determine user experience of e-government services. *Computers in Human Behavior*, 71, 299-306.
- Land Transport Authority (LTA), Singapore (2018). E-Services. Retrieved from: <https://www.lta.gov.sg/content/ltaweb/en/e-services.html>
- Lee, J. (2010). 10 year retrospect on stage models of e-Government: A qualitative meta-synthesis. *Government Information Quarterly*, 27(3), 220-230.
- Muhamad Rais bin Abdul Karim, (Ed.). (1999). *Reengineering the public service: Leadership and change in an electronic age*. Pelanduk Publications.
- Organisation for Economic Co-operation and Development. (2003). *The Case for E-Government: Excerpts from the OECD Report The E-Government Imperative*. *OECD Journal on Budgeting*, 3(1), 1987–1996.
- O'Rourke, D., & Ringer, A. (2016). The impact of sustainability information on consumer decision making. *Journal of Industrial Ecology*, 20(4), 882-892.
- Persson, A., & Goldkuhl, G. (2010). Government Value Paradigms-Bureaucracy, New Public Management, and E-Government. *CAIS*, 27, 4.
- Rabaiah, A., & Vandijct, E. (2011). A Strategic Framework of e-Government: Generic and best Practice". *Leading Issues in e-Government Research*, Academic Publishing International Ltd, 1-32.
- Sá, F., Rocha, Á., & Cota, M. P. (2016). From the quality of traditional services to the quality of local e-Government online services: A literature review. *Government Information Quarterly*, 33(1), 149-160.
- Scott, M., DeLone, W., & Golden, W. (2016). Measuring eGovernment success: a public value approach. *European Journal of Information Systems*, 25(3), 187-208.
- Stefanovic, D., Marjanovic, U., Delić, M., Culibrk, D., & Lalic, B. (2016). Assessing the success of e-government systems: An employee perspective. *Information & Management*, 53(6), 717-726.
- Trautman, L. J. (2015). E-Commerce, cyber, and electronic payment system risks: lessons from PayPal. *UC Davis Bus. LJ*, 16, 261.
- United Nations. (2018). *United Nations e-government survey 2018. E-government for the people*. New York, NY: Department of Economics and Social Affairs.
- United Nations, & American Society for Public Administration (ASPA). (2003). *Benchmarking e-government: A global perspective*. New York, NY: U.N. Publications.
- Zulhuda, S. (2012). The state of e-government security in Malaysia: reassessing the legal and regulatory framework on the threat of information theft.

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## ARTIFICIAL NEURAL NETWORK FOR PREDICTING OIL PIPELINE CONDITION

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### **Abstract**

A pipeline is the most significant asset for the oil and gas industry as it transports the petroleum product from the beneath of the sea to the oil platform to be processed and distributed around the world. However, the maximum lifetime of the pipelines is only ten (10) years then the pipe must be altered or changed. Today, with the availability of advanced analytics which is predictive analytics, it should be utilized to assist the refinery segment of oil and gas industry to decide whether the pipeline should be changed or not based on its situation. The project proposes predictive modelling to predict the oil pipeline condition due to corrosion. The cause of pipeline corrosion occurring is due to chloride concentration, iron concentration and pH reading in sour water. An artificial neural network is predictive modelling that can predict what could happen with a high success rate by training the historical cause of corrosion data. This model is relied upon to assist pipeline administrators with assessing and anticipate the state of oil pipeline condition.

**Keywords:** corporate social responsibility; perceived value; relationship quality.

## 1. INTRODUCTION

Pipelines are the foundation of the oil and gas industry, transport a great many dollars of a few sorts of items in various conditions (i.e. offshore or onshore) [1]. In 1879, the initial 109-mile-long and 6 inches' breadth oil pipeline, was working in Pennsylvania. Today, there are more than 60 nations need to pipeline arranges past 2000 km long [2].

In the oil and gas industry, there is no doubt that the safest pathway to transport petroleum products from the beneath of the sea or even onshore is by pipeline rather than railway and highway [1]. However, a single pipeline accident could cause disastrous environmental damage due to oil spillage as well as economic losses due to production interruption [3]. As per the report by Oil Companies' European Association for Environment, Health and Safety in Refining and Distribution, oil pipeline disappointments could happen because of the accompanying causes: mechanical, operational, erosion, normal risks and outsider movement. The number of accidents because of maturing pipelines in operation has essentially expanded [4]. A few investigation systems have been produced in the most recent decade, for example, attractive flux spillage and ultrasound [5]. Most of the developed condition assessment or failure prediction models are either subjective or not comprehensive where it deals with only one failure cause [6]. Therefore, there is a need for the development of a more objective failure prediction model for oil and gas pipelines that are based on data that has been measured daily for example; temperature, pH, and flow rate. The model will help pipeline operators take the necessary actions to prevent catastrophic failure [7].

Corrosion of crude tower overhead continues to be a significant concern towards integrity and reliability within the refining industry; failure mechanisms have been the subject of many technical papers over the years [8], [9]. Assessing the condition of the pipeline could help the engineers decide whether to change or not the crude tower overhead pipe based on its condition. For many crude units, good desalting and caustic injection practices are first lines of defence in managing overhead corrosion issues while injection of organic amine neutralizers and corrosion inhibitors is also applied to keep corrosion rates to a minimum [3].

Predictive analytics bolster oil and gas organizations by tending to the test of basic hardware execution, life cycle, trustworthiness, and security, and increment used. Now and again, hardware administrators can totally dodge disappointments by making an early remedial move. The utilization of predictive analytics builds the traverse of finding and arranging a time that falls between an occasion and the resulting practical gear disappointment. It additionally bolsters the difficulties of reducing and restricted faculty skill and is fit for strengthening the capacity to wisely work different resources from a focal area, for example in the boring condition [10]. At last, predictive analytics go past early cautioning by giving experiences into the foundations of issues.

Neural network investigation fills in as an exceptionally helpful instrument for examining and anticipating the conduct of frameworks that can't be depicted by any logical conditions [11], [12]. One of the unmistakable qualities of the simulated

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neural network is its capacity to gain as a matter of fact and illustrations and after that to adjust to evolving circumstances. The complexity of real neurons is highly abstracted when modelling artificial neurons. These essentially comprise of data sources like neurotransmitters, which are increased by weights or quality of the separate signs, and after that processed by a scientific capacity which decides the initiation of the neuron. ANNs join simulated neurons keeping in mind the end goal to prepare data [13], [14].

## 2. PROBLEM STATEMENT

A wealth of descriptive analytic tools is available that tell analysts what has happened previously. The problem is that these kinds of analytic focus on the past and only for the reporting purpose rather than to utilize the corrosion data to estimate the pipeline's condition although they know corrosion can affect the pipeline maintenance decision they made, whether to change or not to change the pipeline. Salt fouling and associated corrosion in the crude tower overhead are complex phenomena that affect refining reliability, flexibility, and profitability. Affected components are atmospheric-tower overhead condenser tubes and reflux drums, atmospheric-tower fractionation trays, and vacuum-tower overhead condenser tubes and jet-ejector bodies. Thus, to avoid or to reduce the problems stated, prediction of crude tower overhead condition is needed.

## 3. LITERATURE REVIEW

### *Artificial neural network*

The human brain consists of nearly 10 billion of nerve cells, or basic information-processing units, called neurons and 60 trillion connections, called synapses, between them. Generally, an artificial neuron is a computational model inspired by the natural neurons [15]. Natural neurons receive signals through synapses located on the dendrites or membrane of the neuron. When the signals received are strong enough, the neuron is activated and emits a signal through the axon. This signal might be sent to another synapse and might activate other neurons [3].

Neural networks represent the first machine learning algorithm for predictive modeling [11]. The motivation behind the method is mimicking the structure of neurons in the brain. The basic structure of a neural network involves a set of inputs or known as predictor fields that feed into one or more hidden layers, with each hidden layer having one or more "nodes" or also known as neurons [16].

In certifiable circumstances, the gathered information is normally either boisterous or deficient. In this way, the primary test for chiefs is how to utilize the accessible information to settle on sensible expectations and choices [17]. In these circumstances, the artificial neural system procedure gives great forecasts considering accessible verifiable information. The ANN copies the capacity of the human mind in anticipating designs in view of learning and reviewing forms. It is a powerful prescient instrument because its capacity to gain from recorded information. Cottis et al. (1999) expressed that ANN is a displaying method that is valuable for applications where causal connections among factors are obscure [7].

ANNs can be considered as accumulations of exceptionally straightforward computational units which can take a numerical info and change it, often by means of summation, into a yield. ANNs can be depicted either as scientific and computational models for a nonlinear capacity guess, information grouping, bunching, and non - parametric relapse or, as a reproduction of the conduct of an accumulation of model organic neurons. ANNs can be utilized as a part of an assortment of effective courses: to learn and replicate guidelines or operations from offered cases; to dissect and sum up from test realities and make forecasts from these, or to retain qualities and elements of given information and to match or make relationship from current information to the old information.

### *Relation between artificial neural network and pipeline corrosion*

The basic prerequisite for an effective control of pipe corrosion is by getting to know the corrosion behaviour. Therefore, an extensive corrosion literature is compulsory so that we can simply look up the relevant information though, at first sight, we found it was easy [4]. Moreover, in real world corrosion never seems to appear quite the same situations as tested before, and it is also troublesome in the inquiry of the inherent variability of the corrosion process [7].

Henceforth, this neural network approach has been received to dissect, decipher and anticipate the capability of the implanted steel in solid pieces under two unique conditions viz. without chloride (less likelihood for consumption) and with chloride (high likelihood for erosion) [1]. These estimations were done in a lab level framework and the potential was measured at indicated lengths.

An early posted try and observe a neural network to a corrosion problem become that of Smets and Bogaerts. They developed a sequence of neural networks to expect the SCC of type 304 chrome steel in close to-neutral answers as a characteristic of chloride content material, oxygen content, and temperature [5]. They discovered that the neural community method out-

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performed conventional regression strategies this should constantly be the case with a properly-gear up community, as it's far constantly feasible for the network to version a linear suit. The community used had nearly as many weights as the variety of examples in the statistics set used to teach it. for that reason, there can also have been a bent for the community to match the 'noise' in the statistics in addition to the suggest conduct [18].

Urquidi-Macdonald built up a neural system display for foreseeing the number and profundity of pits in warm exchangers. No data was given about the system estimate other than that it had two concealed layers, or the quantity of preparing focuses, even though there seem, by all accounts, to be fairly few. Henceforth there must be some vulnerability about the unwavering quality of the forecasts got. Then again, the anticipated development of pit profundity and the number appears conceivable [13].

Neural network strategies were used to fit the corrosion price of austenitic stainless steels in sulphuric acid the usage of the facts set defined earlier [13]. The predictions acquired appeared affordable, but the work raised the fundamental questions of the validation of the output of the neural network and the self-belief that would be positioned within the prediction [19]. Unpublished aspects of this work additionally validated the blessings of the use of simulated data to check the neural community methods. Simulated statistics have constructed the use of a feature that about modelled the system under take a look at, and those facts were used to teach neural networks with a comparable configuration to that used on the actual records [12]. because the genuine output of the simulation became known for all combos of entering variables, the overall performance of the simulation network might be evaluated very accurately [20]. This then gave a higher level of self-assurance in recognize of the overall performance of the network skilled on the real statistics. Its miles recommended that there is a valuable approach to support the use of neural networks to version corrosion statistics.

#### 4. CONCLUSION

In the nutshell, Artificial Neural Network is a predictive method that is useful for applications where causal relationships among parameters are unknown. Though the relations between the three parameters; iron, pH, and chloride are unknown, ANN can produce high successful rate of the model with custom arguments of the model to compute predictive condition of crude tower overhead. Thus, to achieve high accuracy of ANN model, a comprehensive training of the corrosion data is needed in order to increase the accuracy of prediction output. Formulation on ANN also important as it will affect the model's accuracy. The collected data were prepared, organized, and subsequently used to train, test, and validate the models.

Next is the prototype to visualize the predicted output must be in an interactive environment so that it can be a meaningful and useful information to the users which in the end the users can optimize their decision making.

With predictive analytics using ANN, the users now can make an efficient decision making on changing crude tower overhead pipe as their information are now being automatically computed by ANN to do prediction of the pipe condition using business intelligence tools.

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#### REFERENCES

- [1] D. D. Macdonald and G. R. Engelhardt, "Predictive modeling of corrosion," *Shreir's Corros.*, pp. 1630–1679, 2010.
- [2] M. S. El-Abbasy, A. Senouci, T. Zayed, F. Mirahadi, and L. Parvizsedghy, "Artificial neural network models for predicting condition of offshore oil and gas pipelines," *Autom. Constr.*, vol. 45, pp. 50–65, 2014.
- [3] I. Abdul Aziz and K. E. Lee, "A Hybrid Prediction Model for Pipeline Corrosion Using Artificial Neural Network with Particle Swarm Optimization," *J. Eng. Appl. Sci.*, vol. 13, no. 3 SI, pp. 3131–3138, 2018.
- [4] N. S. Reddy, "Neural Networks Model for Predicting Corrosion Depth in Steels," *Indian J. Adv. Chem. Sci.*, vol. 2(3), pp. 204–207, 2014.
- [5] C. Yang, J. Liu, Y. Zeng, and G. Xie, "Prediction of components degradation using support vector regression with optimized parameters," *Energy Procedia*, vol. 127, pp. 284–290, 2017.
- [6] M. M. Din and N. Ithnin, "an Artificial Neural Network Modeling for Pipeline," vol. 10, no. 2, pp. 512–519, 2015.
- [7] R. A. Cottis, "Neural network methods for corrosion data reduction," *Shreir's Corros.*, pp. 1680–1692, 2010.
- [8] A. P. Teixeira, C. G. Soares, T. A. Netto, and S. F. Estefen, "Reliability of pipelines with corrosion defects," vol. 85, pp. 228–237, 2008.

---

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*Digital Transformation – Opportunities and Challenges*

---

- [9] S. N. Hassanudin, I. A. Aziz, J. Jaafar, S. Qaiyum, and W. M. A. M. Zubir, "Predictive analytic dashboard for desalter and crude distillation unit," 2017 IEEE Conf. Big Data Anal. ICBDA 2017, vol. 2018-January, no. September 2018, pp. 55–60, 2018.
- [10] N. Muthukumar, Petroleum Products Transporting Pipeline Corrosion-A Review. Elsevier B.V., 2014.
- [11] K. Liao, B. Cao, and Z. Liu, "An effective internal corrosion rate prediction model for the wet natural gas gathering pipeline," Proc. - 2011 Int. Conf. Comput. Inf. Sci. ICCIS 2011, pp. 698–701, 2011.
- [12] J. Hu, Y. Tian, H. Teng, L. Yu, and M. Zheng, "The probabilistic life time prediction model of oil pipeline due to local corrosion crack," Theor. Appl. Fract. Mech., vol. 70, pp. 10–18, 2014.
- [13] G. De Masi, R. Vichi, M. Gentile, R. Bruschi, and G. Gabetta, "A Neural Network Predictive Model of Pipeline Internal Corrosion Profile," 2014 First Int. Conf. Syst. Informatics, Model. Simul., pp. 18–23, 2014.
- [14] Z. Jančíková, O. Zimný, and P. Košťál, "Prediction of metal corrosion by neural networks," Metalurgija, vol. 52, no. 3, pp. 379–381, 2013.
- [15] G. Jiang, J. Keller, P. L. Bond, and Z. Yuan, "Predicting concrete corrosion of sewers using artificial neural network," Water Res., vol. 92, pp. 52–60, 2016.
- [16] X. Li et al., "Evaluation of data-driven models for predicting the service life of concrete sewer pipes subjected to corrosion," J. Environ. Manage., vol. 234, no. September 2018, pp. 431–439, 2019.
- [17] J. L. Alamilla, E. Sosa, C. A. Sánchez-Magaña, R. Andrade-Valencia, and A. Contreras, "Failure analysis and mechanical performance of an oil pipeline," Mater. Des., vol. 50, pp. 766–773, 2013.
- [18] W. Xu, C. Bao, J. Choung, and J. Lee, "Advances in Engineering Software Corroded pipeline failure analysis using artificial neural network scheme," vol. 112, pp. 255–266, 2017.
- [19] S. Hernández, S. Nešić, G. Weckman, and V. Ghai, "Use of artificial neural networks for predicting crude oil effect on carbon dioxide corrosion of carbon steels," Corrosion, vol. 62, no. 6, pp. 467–482, 2006.
- [20] M. Engineering, "Artificial Neural Network Simulation Model for Predicting Oil and Gas Pipeline Corrosion Rate in Nigerian Niger Delta," vol. 1, no. 1, 2017.

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**THE TRANSFORMATION OF CONSTRUCTION PROCESSES THROUGH BUILDING INFORMATION MODELING- BASED CONTRACTUAL APPROACH FOR DESIGN-BUILD CONSTRUCTION PROJECTS**

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**Abstract**

The implementation of building information modeling (BIM) throws up a host of interesting legal and contractual challenges, especially in an industry as multi-faceted as construction that is vulnerable to risk due to the complexity of the construction processes characterized by unforeseen circumstances. However, the existing BIM contracting systems may not extensively facilitate the practice of BIM management processes. Contract research has emerged as facility management and deconstruction procedures do not appear to reflect the BIM requirements. This paper seeks to set out an innovative contractual framework of contract for use in any BIM-based construction project. Thus, this paper contributes new knowledge of the proper use and harmonization of contract functions by extensively identifying the contractual issues within BIM functionality with design and build contract procurement method throughout the phase of the building construction project life cycle.

**Keywords:** *building information modeling (BIM); contract management; construction processes.*

## 1. INTRODUCTION

The global construction industry has been showing great interest in BIM implementation specifically within the AECOO (architecture, engineering, construction, owner and operator) industry. For this study, the concise categorization was adopted, under which technical risks are exemplified as inadequate project experience, lack of software compatibility, model management difficulties, and inefficient data interoperability. It is worthy of note that the technical risks of BIM actively feed into its legal uncertainty, and therefore addressing the latter will result in the resolution of former (Olatunji, 2011; Manderson *et al.*, 2015). As a result, the contracts may not give a comprehensive digital representation of BIM environments and also may not include the special conditions and amendments that are due to the issues around unsatisfactory technological interoperability, and which can cause the flow of information through a project lifecycle to be impeded (Grilo and Jardim-Goncalves, 2011; Stapleton *et al.*, 2014).

As BIM becoming ingrain in the delivery process, the inefficiencies of these existing contracts have become visible due to inadequate digital representation of the building process that would facilitate the exchange and interoperability of information in a digital format (Olatunji, 2015). Although prior research has determined some of the contractual and legal issues with regard to BIM execution, less attention has been given to the influence of BIM upon interoperability issues. The development preliminary framework of contractual challenges is based on a systematic review of the literature and is presented in Abd Jamil and Fathi (2018).

A case study was conducted within the Malaysian building construction project as an investigative and exploratory study because it provides an in-depth comprehension of that event. To be precise, this study provided insights into BIM-based contractual challenges associated with inadequate information interoperability management from the conceptual design to the facility management (FM) phase are neither automated nor seamless. The findings and discussion of the case study attempted to achieve the primary objective of this research paper that is to formalize an understanding of the roles of the BIM project teams on the information interoperability management process by assessing the project contract requirements specifically of how information is generated, processed and executed on.

## 2. RESEARCH APPROACH

The first step of the research consisted of a review of the project documents that the project team had made available to the researchers with the aim in answering research question. The reviewed documents included the project's BIM execution plan,

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the project organization chart, appendices dedicated to the BIM processes and appendices related to the profiles of the BIM stakeholders. Other subsidiary documents related to the BIM modelling activities were also reviewed by the researchers. These documents included the BIM objects organization tree and nomenclature, the file transfer protocol, the clashes and interferences management process, the quality control plan, the generator of conflict spheres guide, the BIM Collaboration Format (BCF)-based collaborative communication process, the level of detail LOD specifications file, the BIM processes and requirement manual tutorial, the data transfer tool guide and the ‘need for’ statement including the contract form for the project. Following the review of documents, semi-structured interviews were conducted with key design and construction personnel on the selected project involving BIM. The same set of questions was used in all the interviews to examine how BIM could potentially improve the efficiency of the personnel and information process particularly from the contractual and legal perspective on the basis of the evidence that emerged. The information interoperability issues were highlighted in the case study with iterative guides from literature review using content analysis of primary data sources. An NVivo software qualitative analysis conducted data mining on the interview transcripts input into the NVivo software.

### 3. RESEARCH FINDINGS

This research has relied on a construction project case study in Malaysia has been procured under a design and build (D&B) contract where the consultants were hired by the main contractor and the contractor held a single contract with the client, the infrastructure arm of the provincial government. The original plan for the project was to utilize a traditional low bid procurement design-build contract whereby it shall include to plan, design, construct, complete, test and commission the works in accordance with the contract. During the design phase, design teams are required to provide a coordinated ‘Full Design Model’ based on the tenderer’s scope of BIM requirements. There was general inclusion of file sharing platform including hardware and software version for access to sharing site but however, the contract does not clearly specify information and model exchange protocol. Although the contract has stated that the contractor shall be responsible for creating and maintaining the construction model and the creation of the As-Built model. However, the requirements of BIM models inspection and validation procedure are not detailed out in the contract. There will be no discussion regarding the precise details and characteristics of the project for reasons of confidentiality.

The case study highlighted a number of ways that the Facility Manager could make a major or even a minor contribution as regards to design and variations. These contributions include advising as to end-user behaviour and requirements, the supply of alternative solutions to a number of issues that may arise from the project. On a day-to-day basis, the BIM manager should be able to oversee storage of latest model is maintained to avoid parties relying on outdated information. As such, facility management team (FMT) need to request the information they require from the project management team in a suitable format which can then be used to maintain the facility following project completion. Such requirements can be performed at the conceptual design stage by which the format of data and information needs to be mentioned clearly in the employer’s information requirements (EIR) so that all stakeholders will be clear on what is needed for delivery at the end of the project. In this regards, soft landings serve as a platform that requires the involvement of FMT in BIM meetings from the start of the project and up to its completion in order to facilitate a proper handover and close out. The findings developed a characterization that would provide a systemic and evolutionary account of interoperability from the unique aspect of BIM contract administration to preserve integrity and accuracy of the information. There has been a lack of early involvement of the contractors and FMT coupled with a reluctance to move to cutting-edge technologies for the handover of documentation where the contractor’s information and communication technologies (ICT) system was only made known after the tender stage. FM personnel who used industry foundation classes (IFC) as a database for their FM systems asserted that the IFC spreadsheet did not include all the FM required data, such as the preventive maintenance data and that as a result, they had to enter this data manually into their FM systems. As such, the following sections provide some important elements to ensure the project team’s data and systems are sufficiently interoperable.

#### *Understanding the necessary involvement of FMT*

The way forward for adoption of BIM as part FM is necessary to provide ways of managing knowledge of building operations that will be able to be used as part of future designs and explained in the following sub-sections:

- The D&B design team should identify and prioritize the appropriate BIM Uses that they believe will be of benefit to the project. Before the identification of identifying BIM Uses, BIM related project goals should be outlined by the project team. These project goals should be project specific, able to be measured, and the goals should indicate the desire of the team to work hard on increasing and enhancing the success of the facility’s planning, design, construction and operations. One category of the goals should be directed at the general performance of the project which includes a reduction in the duration of the project schedule and project costs, or otherwise achieving an increase in the overall quality of the project

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development; more specifically by having record models that are more accurate to improve performance modelling and commissioning quality.

- Since model quality seems to have been raised as an issue by project participants, our study proposes the following: requirements for BIM template should additionally be incorporated and circulated into consultant, subcontractor and vendor agreements so that the quality and consistency of project and drawing production is maintained throughout the entire project life cycle. As an example, each subcontractor may be asked by the team to model the 3D design coordination scope of work, or the team might require that the vendors supply them with models and data that can be incorporated into the coordination or record models.
- Should consultants, subcontractors, and vendors required modelling initiatives then these need to be defined clearly in the contracts and also include the scope, schedule for model delivery, and file or data formats. If there are any changes in templates during the drawing production stage this will need to be notified and mutually agreed between stakeholders. Should the BIM not be included as part of the contracts then additional steps will need to be pursued to make sure that all project team members follow the BIM plan. FM organizations are able presently to reap the benefits of BIM for FM by developing a BIM specification and templates that are tailored and suit their particular project requirements.

#### **4. CONCLUSION**

The case study findings have provided a justification for the point that updated BIM content vital for the progress of construction as it relates to maintaining, retrofitting, and demolition; the functions of model and data management of content at the maintenance phase. This study presents an opportunity to increase the knowledge of a viable approach that gives a potential solution to the current perception of the fragmented and isolated approach of present construction processes. The increase in knowledge would be gained by the use of a collaborative contractual framework for BIM-based settings. Furthermore, this study gives a number of essential insights with regard to innovation in the global construction industry. One of these concerns the ICT protocol that should be seen as whole or as a part of the contractual setting where it is crucial to maintaining central building information that records the details and specification of the buildings and enables to assessment of the information quality of BIM, thus ensuring that the usefulness of data quality remains high. A future study is envisioned that will establish a reference framework drawing together the current and probable documented legal and contractual challenges for the BIM management process that will facilitate the seamless exchange and interoperability of information. The exchange and interoperability would be accomplished by the enhancement of collaboration between the project participants throughout the project life cycle.

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#### **REFERENCES**

- Abd Jamil, A.H. & Fathi, M.S., 2018. Contractual challenges for BIM-based construction projects: a systematic review. Built Environment Project and Asset Management, p.BEPAM-12- 2017-0131.
- Grilo, A., & Jardim-Goncalves, R. (2011). Challenging electronic procurement in the AEC sector: A BIM-based integrated perspective. Automation in Construction, vol 184 20(no 2), 107-114.
- Manderson, A., Jefferies, M. and Brewer, G., 2015. Building information modelling and standardised construction contracts: a content analysis of the GC21 contract, Construction Economics and Building, 15(3), 72-84.
- Olatunji, O.A. (2011), "A preliminary review on the legal implications of BIM and model ownership", Journal of Information Technology in Construction (ITCon), Vol.16, pp. 687-696.
- Olatunji, O.A. and Akanmu, A. (2015), "BIM-FM and consequential loss: how consequential can design models be?", Built Environment Project and Asset Management, Vol. 5 No. 3, pp. 304-317.
- Stapleton, K.A.J., Gledson, B.J. and Alwan, Z. (2014). Understanding technological interoperability through observations of data leakage in Building Information Modelling (BIM) based transactions. In E. Thompson, ed. Proceedings of the 32nd eCAADe Conference. Newcastle Upon Tyne, England, UK, 10-12 September 2014: eCAADe, 515-524.

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**DIGITAL TRANSFORMATION - CORPORATE SOCIAL RESPONSIBILITY OF  
FOOD SAFETY IN VIETNAM**

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**Abstract**

Unsafe food containing harmful bacteria, viruses, parasites or chemical substances, causes more than 200 diseases – ranging from diarrhoea to chronic diseases such as cancers, and it creates a vicious cycle of disease and malnutrition, particularly affecting children and older people. Diseases caused by unsafe food claim an estimated 2 million lives globally each year. This paper discusses how digital transformation aligns with corporate social responsibility and the immediate action required in order to keep safety and quality along the food supply chain in Vietnam.

**Keywords:** *digital transformation; food safety; information; impact; Vietnam; CSR.*

**1. INTRODUCTION**

Thanks to the open door “Doi Moi” policy in 1986, Vietnam economy has gained significant growth. Vietnam is on the spotlight for its powerful economic growth, since it benefits from its geographical location and has attracted a high rate of direct investment. Vietnam transformed from one of the world’s poorest nations to a lower middle-income country. After the country’s reunification until late 1980s, GDP per capita in Vietnam was stuck between \$200 and \$300<sup>2</sup> but now is about 2’432.2USD<sup>3</sup>.

Rapid economic growth and development led to dramatic changes in the economic and socio-demographic structure of the population in Vietnam. Demand is growing for food, education, medical services, infrastructure, housing, and so on. Production and import of these products and services is following suit. Especially safe food with proper labeling is in very high demand<sup>4</sup>.

“Food safety is one of the two most pressing issues for people in Vietnam, more important than education, health care or governance. It is of great concern to both consumers and policymakers in Vietnam and frequently appears in the media and in policy discussions”<sup>5</sup>.

Vietnamese consumers have a strong preference for fresh, unprocessed or only slightly processed food. Most food (90%) is traded on informal/traditional markets. It is very difficult to trace where the food come from. Smallholders produce most (80%) of the fresh meat and leafy vegetables<sup>6</sup>. These farmers, while producing safe or safer foods for their own consumption, hardly follow food safety requirement when producing for the market, due to profitability considerations<sup>7</sup>. In some cases, they are not even aware of the negative impact on the human health when using banned chemical to grow vegetables or to raise animals. Buying food involves a lot of trust into the suppliers. Risks for unsafe food can appear along the whole production chain. Food often consists of many ingredients from different sources. It is one of the characteristics of food, that safety and particularly quality cannot be completely be guaranteed through an analysis of the final food. To ensure quality and safety, an appropriate control of processes throughout the food value chain is needed<sup>8</sup>.

Information is required for food safety decision-making by all stakeholders. The most visible impact of digitalization on food production and transaction systems counts on how information is exchanged. The availability of information introduces a new level accountability among stakeholders at all stages of the food supply chain and enhances confidence and trust among them. Traceability is key to build trust, increases confidence for consumers and farmers and reduces transaction costs<sup>9</sup>.

A practical and reliable tool or platform for traceability is essential for enhancing the compliance of the food industry in Vietnam.

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## 2. METHODOLOGY

An in-depth qualitative approach is employed in this study. The main sources of secondary data were documentation, articles, research papers, and the report of the World Bank in 2016 about Vietnam Food Safety Risks Management - Challenges and Opportunities.

Focus group discussion and interview with experts in the field of Corporate Social Responsibility (CSR) and digital transformation of food safety, and related persons, were the most important source of primary data.

## 3. DISCUSSION

CSR research has evolved over the last 50 years<sup>10</sup>. It developed into one of the top priorities of businesses over the last decade and was ranked as the number one focus of managers in the global retail and consumer goods sector in 2011<sup>11</sup>. CSR in the food sector faces many challenges. One of them is that small and large enterprises differ in their approach to CSR. This implies potential conflicts regarding CSR implementation in the food supply chain<sup>12</sup>.

The framework for CSR implementation to the food supply chain includes animal welfare, environmental impact, aspects of biotechnology, health and safety aspects, fair trade, and labor and human rights<sup>13</sup>.

“Government approaches must evolve and keep pace with food system developments in order to meet objective of ensuring consumer confidence”<sup>14</sup>.

The food safety regulatory framework in Vietnam is the product of a complex multi-level legislative process<sup>15</sup>. The Ministry of Agriculture and Rural Development (MARD), the Ministry of Health (MOH) and the Ministry of Industry and Trade (MOIT) have primary responsibility for food safety. The Ministry of Science and Technology (MOST) is responsible for the development of standards, laboratory accreditation and the methods for quality control of imported and exported goods. Moreover, many food safety activities and resources are decentralized to provincial and lower levels. Vietnam has a comparably modern food safety legislation system, but further improvements are needed in food safety performance<sup>16</sup>.

Many approaches have been tried for improving the food safety in Vietnam, but there are still challenges, among them the improvement of sustainability and scalability<sup>17</sup>. There are also major gaps between the regulations and the actual implementation.

One of the key issues of food safety in Vietnam is that certain food value chain stakeholders lack the awareness for the importance of ethics and compliance, valuing short term economic profit over the health of their consumers<sup>18</sup>. In turn, “the shortfall in ethical and compliant behaviour in the food industry can be attributed to dysfunctional incentives”<sup>19</sup>.

On the other hand, although food safety problems are widely publicized, part of the problem in Vietnam is actually also the inappropriate way of communicating food risks<sup>20</sup>. Vietnamese consumers are only at the beginning of creating a clear concept of what exactly constitutes a food risk. If problems arise, food scares emerge but they have no lasting impact because they are quite often unspecific. In short: Vietnam paid little attention into education and informing<sup>21</sup>.

The traceability of all ingredients and production additives is a key factor in building trust into food safety. Traceability is part of an overall cost-effective quality management system that can also assist in continuous improvement and minimization of the impact of safety hazards<sup>22</sup>.

Digital platforms can help improving the traceability, but the problem is very complex. Different types of food have different challenges when trying to trace the production chain. In meat production for example, one can mark the animals and test their health before slaughtering. However, what is about the small pieces in the following processing? In the crop production, the problem is even bigger. To check the provenience of a charge of crop, it has to follow the whole production chain from seeding through fertilizing and spraying, harvesting, transportation and processing.

The producers are playing an important role in this game. They must be convinced, that it is worthwhile to produce food in a safer way not only in a long-term perspective. They must get better prices for food if the whole chain of production is traceable. This of course requires them providing their data, data allowing to answer the questions of “who (i.e., actor/product), what (i.e. actor/product’s information), when (i.e. time), where (i.e. location), why (i.e. cause/reasons), and how (i.e. measure/communicate)” with regard to food safety, quality and visibility<sup>23</sup>.

A supplier's code of conduct is not enough<sup>24</sup>.

Precondition is a platform and accessibility to this platform through a web or a mobile client. The application should be easy to handle and guarantee data security and privacy. The resulting database could not only be used for tracking the provenience

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of the ingredients of processed food, but also be an information base for data analytics and machine learning to prevent risks in the supply chain with the help of artificial intelligence.

#### 4. CONCLUSION

Food safety is a shared responsibility of all stakeholders, including primary producers, transporters, traders, distributors, risk assessors, policy makers, communicators and customers. “Consumers’ reaction to firms’ responsible conduct create important incentives for companies to engage in CSR”<sup>25</sup>. Traceability can be used as a tool for stakeholders in order to give their feedback to the right place at the right time. It should be included in the dimensions of CRS in the food supply chain in Vietnam.

#### REFERENCES

- [1] World Health Organization Representative Office Vietnam. [http://www.wpro.who.int/vietnam/mediacentre/releases/2015/world\\_health\\_day\\_2015\\_press\\_release/en/](http://www.wpro.who.int/vietnam/mediacentre/releases/2015/world_health_day_2015_press_release/en/). April 7, 2015.
- [2] <https://www.weforum.org/agenda/2018/09/how-vietnam-became-an-economic-miracle/>, accessed June 21, 2019
- [3] <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=VN>, assessed June 26, 2019
- [4] <https://english.vov.vn/economy/demand-growing-for-safe-food-proper-labelling-in-vietnam-346449.vov>, assessed June 26, 2019
- [5] World Bank (2016), Vietnam Food Safety Risks Management - Challenges and Opportunities
- [6] World Bank (2016), Vietnam Food Safety Risks Management - Challenges and Opportunities
- [7] Hung Nguyen, et al (2017), Food safety in Vietnam: where we are at and what we can learn from international experiences, BioMed Central. <https://doi.org/10.1186/s40249-017-0249-7>
- [8] M. Fritz, G. Schiefer, Int. Journal of Production Economics 117 (2009) 317 - 329: Tracking, tracing and business process interests in food commodities
- [9] Myo Min Aung and Yoon Seok Chang (2012), Traceability in a food supply chain: Safety and quality perspectives, Food control,39:172-184 <https://doi.org/10.1016/j.foodcont.2013.11.007>
- [10] Carroll, A. B. (1999), Corporate Social Responsibility, Business and Society 38(3): 268–295.
- [11] The Consumer Goods Forum (2011). Top of Mind 2011. France: The Consumer Goods forum
- [12] Harman, M (2011), Corporate Social Responsibility In The Food Sector, European Review of Agricultural Economics, 38: 297- 324
- [13] Maloni, M and Brown, M (2006), Corporate Social Responsibility in the Supply Chain: An Application in the Food Industry, Journal of Business Ethics, 68:35–52
- [14] Booth, M (2019), Digital Transformation of the Food System, IFSC\_1/19/TS3.5
- [15] World Bank (2016), Vietnam Food Safety Risks Management - Challenges and Opportunities
- [16] World Bank (2016), Vietnam Food Safety Risks Management - Challenges and Opportunities
- [17] World Bank (2016), Vietnam Food Safety Risks Management - Challenges and Opportunities
- [18] World Bank (2016), Vietnam Food Safety Risks Management - Challenges and Opportunities
- [19] Hung Nguyen, et al (2017), Food safety in Vietnam: where we are at and what we can learn from international experiences, BioMed Central. <https://doi.org/10.1186/s40249-017-0249-7>
- [20] Hung Nguyen, et al (2017), Food safety in Vietnam: where we are at and what we can learn from international experiences, BioMed Central. <https://doi.org/10.1186/s40249-017-0249-7>
- [21] World Bank (2016), Vietnam Food Safety Risks Management - Challenges and Opportunities
- [22] Myo Min Aung and Yoon Seok Chang (2012), Traceability in a food supply chain: Safety and quality perspectives, Food control,39:172-184 <https://doi.org/10.1016/j.foodcont.2013.11.007>
- [23] Adapted from Myo Min Aung and Yoon Seok Chang (2012), Traceability in a food supply chain: Safety and quality perspectives, Food control,39:172-184 <https://doi.org/10.1016/j.foodcont.2013.11.007>
- [24] Bin Jiang, Journal of Business Ethics (2009): Implementing Supplier's Code of Conduct in global supply chains
- [25] Lev, B., et al. (2010). Is doing good good for you? How corporate charitable contributions enhance revenue growth. Strategic Management Journal 31: 182–200.

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## **DIGITAL TRANSFORMATION FOR AFFORDABLE HOUSING DEVELOPMENT IN MALAYSIA**

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### **Abstract**

The Malaysian Government has allocated a policy on the supply of affordable houses to its people, considering that there is a critical gap between the demand and supply towards the group income of M40. This effort also involved the private sector albeit facing the challenges in the complex market such as matching the household income with the suitable housing price in a certain area. Along with the advancement in the digital technology, the digitisation method in planning and monitoring development is one of the best efforts to integrate various data and information for the purpose of analytical data in the supply and demand of the affordable housing. Hence, this paper is aimed to explore the approach of digital map with the use of Geographical Information System (GIS) technology in analysing the equivalence of the household income and the price of affordable houses in the districts of Selangor. The secondary data obtained from various agencies has been used to structure a spatial model of affordable housing. The findings have ascertained that the integration of information from various stakeholders is needed to ensure the successfulness of the affordable yet ensuring the sustainability of the housing demands for today and in the future.

**Keywords:** *affordable housing; business model; digital map; industrialised building system; geographical information system*

## **1. INTRODUCTION**

Malaysian housing provision has been experiencing a huge transition in the last few decades which dramatically changing the way of society need due to the socio-economic development, urbanization and population increment factors after national independence era (Aris *et al.*, 2018). The evolving society needs and demands enforced business firms to become more innovative and agile in responding to the current market's desire. For that reason, it calls for the application of relevant information system and information technologies that are capable to analyze various data sources by using digital tools and techniques. Ardito *et al.* (2019) suggested that the use of digital technologies capable to visualize and forecast the future opportunities offered by the complex information from digitization for matching demand and supply is crucial in meeting the demands.

In responding to the higher demand of volume for houses, the construction industry moved a step forward to using the industrialized building system (IBS) which found to be more advanced, adjacent to the Industrial Revolution 4.0. Therefore, the manufacturing and production of the construction product such as the precast concrete should be using the precise robotic system. Although the development of advanced manufacturing industry for the construction product such as the precast concrete has been experiencing an evolution in agile technology relevant to the demands of current housing market which requires the productive establishment of the affordable houses, the issue on equality of affordable house prices according to the location has been greatly debated due to the residential price offered in the market did not target the M40 group (Bank Negara Malaysia, 2016; The Sun Daily, 2018). This led to the disruption of whole supply chain management for affordable housing development and supply. Hence, the step of integrating the related data proposed to the ministry by the various stakeholders including REHDA (RI, 2018), Bank Negara Malaysia (Ling *et al.*, 2017) and Khazanah Research Institute in monitoring the accurate housing plan. However, to date, there is no study conducted in attempt to explore the integration of the data to be used through the approach of GIS in tackling the affordable housing demand and supply gap. Thus, this paper attempts to integrate the existing secondary data and predicting the future house price at a local scope of socio-economic development.

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## 2. LITERATURE REVIEW

The housing market of Malaysia faced the complex crisis in meeting the high demands and at the same time, the issue of oversupply (Lin Lee, 2014) and overhang also occurred. This crisis is known as the mismatch of demand and supply of affordable housing for targeted M40 income group. This will disturb the existing business model affairs and transformation measures through the digital approach are needed. It is due to the voice and opinion of the stakeholders which requested the establishment of a central data to visualize the real situation of residential market. Hence this paper will discuss the method of utilizing the GIS software. The method of calculating the median multiple (MM) approach in measuring the affordable houses recognized by the World Bank was adapted by this paperwork. It was where the house price was calculated based on the median income ratio of 3.0. According to this calculation of affordable approach, the price of houses in Malaysia was RM188,208 for the year 2016. However, the median incomes for each state in Malaysia were different, which lead to the differences in the prices of affordable houses (Aris *et al.*, 2019). Even though the government has taken the action of setting the guideline of affordable houses' price to RM300,000 and below (Bernama, 2019), the developers still faced the high cost of land especially in the urban area with high density (RI, 2018)

In conducting the real estate business, developers have strategized various methods to lower the construction cost by using the IBS as one of the method of construction work. Still, the efforts of acknowledging the utilization of the IBS were doubted by the developers due to the lack of economies of scale towards the IBS product in the market, leading to the higher cost of the product used for the construction (Amin *et al.*, 2017). Nevertheless, the application of advanced technology in various fields of business cannot be denied, and adopting the use of advanced technology as the competitive advantage for them to supply better product to customers (Ashwell, 2017). There were more companies which have been utilizing the various platforms of information technology to forecast the customers' demand which will finally bring the optimum profit to them (Krishnamoorthi and Mathew, 2018). In the matter of supplying the affordable house process, the prediction and forecast is a must so that all stakeholders will gain the benefits from it.

## 3. RESEARCH METHODOLOGY

Therefore, this study adopted the secondary data from various sources which then were keyed in the attribute table in the ArcGIS software (version 10.5). The data entry and collection in this attribute table was in a form of central data processing. This centralized data were then generated and visual maps were illustrated in Fig.1 and Fig.2. This paperwork used the method of median multiple (MM3) approach in measuring the index of affordable houses. According to MM approach, the median household income financially capable to afford was three times by the annual household income. So the calculation of affordable housing is:

$$\text{Market house price} / \text{annual median income by district} = \text{affordability index} \text{ If } \text{RM}300,000 / (\text{RM}5293 \times 12 \text{ month}) = 4.7$$

(seriously unaffordable)

### *Case study Selangor state*

The scope of this study was narrowing down to the area of Selangor, which located in the west of Peninsular Malaysia and contain the highest population resident in Malaysia. The Selangor government has set the guideline of housing development requirements in Selangor by allocating a number of affordable housing units in every housing zone in that particular state. Although this measure has been helping the people of in the state to own a house since 2013, there were still some gaps that needed to be filled in order to meet the demands of M40 group in Selangor. Even the residential overhang in this state has been reporting to be increased from 2016 to 2018 which exceeded 3765 units. If a research to understand the market demand is not being conducted to study the supply of the houses which do not properly meet the affordable price, it was feared that more overhang units will exist, interfering the economic stability.

### *Types of data and data sources*

The collection of secondary data involved various sources from related agencies. The types of data related to the study will be entered in the attribute table software of ArcGIS 10.5 and illustrated in the form of digital maps. The summary of the related data is as in Table 1.

**Table 1:** Various data sources for affordable housing supply using precast concrete product

Data Sources				Types of Data	Data format
Construction (CIDB)	Industry	Development	Board	IBS precast concrete location	.xls file

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PLAN Malaysia	Zoning housing land use	.shp file
Department of Statistic Malaysia (DoSM)	Median household income	.pdf file
National Property Information Centre (NAPIC)	Median all house price	.pdf file
Jabatan Penilaian dan Perkhidmatan Harta (JPPH) Selangor	Land price	.pdf file
Lembaga Perumahan dan Hartanah Selangor (LPHS)	Housing zoning	.pdf file

#### 4. DISCUSSION AND FINDINGS

All in all, the integration of data related to the development of affordable houses can be displayed and analysed accordingly to the local median income in the districts of Selangor using the ArcGIS software. Zoning land use pattern for housing in Selangor (future supply) was centralized in the urban, suburban and small parts of rural zones. If the government has set the house price of RM300K as the price of affordable house according to the forecast of 2018 and 2020, some of the residents in the suburban and rural zone in Selangor will not be able to afford a house with that stipulation. However, the residents in the rural area can afford to build their own house which equally fit to their income due to the lower price of land at the area. If the developers' strategy was to develop houses in the rural area to optimize their profit by offering affordable price to the potential buyers, the housing project is considered having a high risk to become overhang, due to the problem such as the convenient access to the public transportation (Olanrewaju et al, 2016). Hence, the government should take a more proactive approach to provide the convenient public transportation based on the trend of this housing supply. Through this forecast method, the increased in median income with the suitable affordable house price can be predicted and the developers will have the chance to construct the strategy of utilizing the precast concrete product from the supplier, whether through negotiation or open tender so that they are capable to minimize the transportation cost to their construction site. This forecast method through the digital display will aid the stakeholders in evaluating the equity of the housing development project so that it will be suitable and coincided with the targeted population.

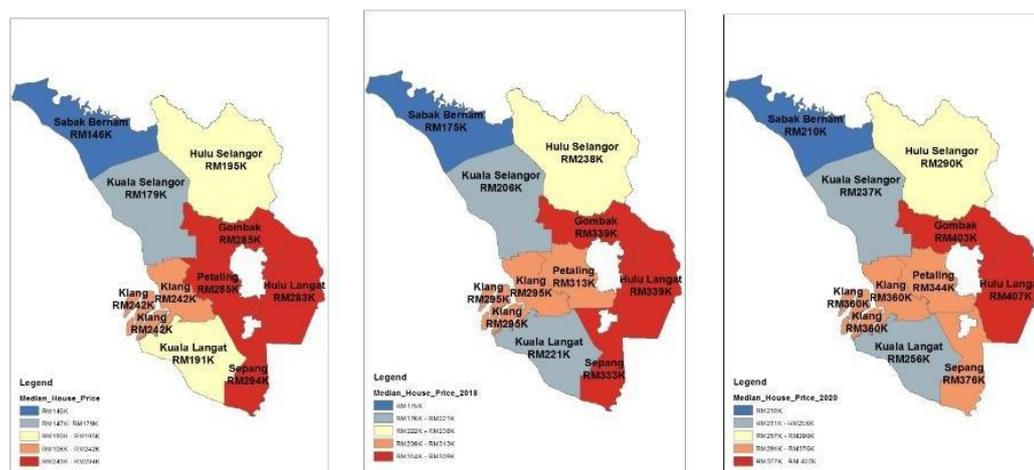
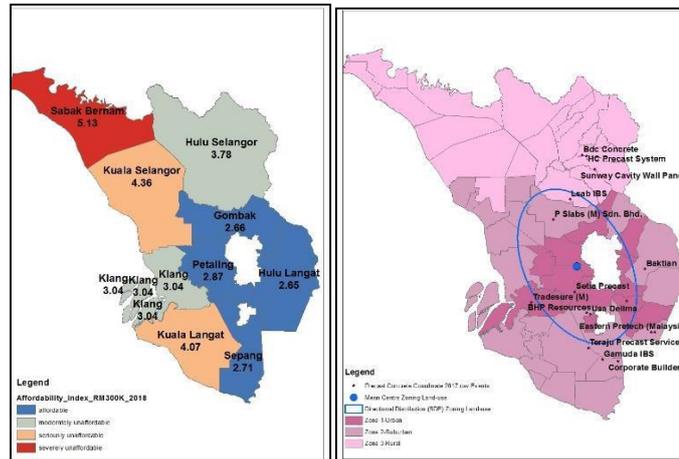


Fig. 1: Thematic map for affordable house price for year 2016 and prediction on 2018 and 2020

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**Fig. 2:** Affordability index for year 2018 if RM300K median house price and precast concrete manufacturer registered with CIBD in year 2017 with zoning for housing in Selangor

## 5. CONCLUSION AND RECOMMENDATION

Overall, utilizing of digitisation in integrating the information and data is crucial in transforming the affordable housing development for all stakeholders. The cooperation among developers, government, and government agencies via information sharing will give a great impact towards the supply chain for forecasting the wish and demands of the people which are also the prospective buyers. The approaches that have been discussed in this paper should be further analysed by taking into account other data factors such as customer profiling. Further study on data centralization with the utilization of cloud computing for sharing of information between the firm and web application will enable the information to be shared by various parties in order to reduce the operational cost and meet the demands through the rational affordable house prices offered.

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## REFERENCES

- Ardito, L., Petruzzelli, A. M., Panniello, U., & Garavelli, A. C. (2019). Towards Industry 4.0. *Business Process Management Journal*, 25(2), 323–346.
- Aris, N. A. M., Fathi, M. S., Harun, A. N., & Mohamed, Z. (2019). Towards A Sustainable Supply of Affordable Housing with Prefabrication Technology : An Overview. *Journal of Advanced Research in Business and Management Studies*, 15(1), 1– 13.
- Aris, N. A. M., Syazli Fathi, M., Nahar Harun, A., & Mohamed, Z. (2018). An Overview of Housing Purchase and Delivery System in Malaysia. *International Journal of Engineering & Technology*, 7(3.21), 57.
- Ashwell, M. L. (2017). The digital transformation of intelligence analysis. *Journal of Financial Crime*, 24(3), 393–411.
- Bank Negara Malaysia. (2016). Assessing Demand and Supply Conditions in The Malaysian Property Market. In *Bank Negara Annual Report 2015*.
- Bernama. (2019). Harga Rumah Mampu Milik Harus Bawah RM300k Seunit – PM. *Bernama*. Retrieved from <https://www.pmo.gov.my/ms/2019/03/harga-rumah-mampu-milik-harus-bawah-rm300k-seunit-pm/>
- Krishnamoorthi, S., & Mathew, S. K. (2018). Business analytics and business value: A comparative case study. *Information and Management*, 55(5), 643–666.

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---

- Lin Lee, C. (2014). The inflation-hedging characteristics of Malaysian residential property. *International Journal of Housing Markets and Analysis*, 7(1), 61–75.
- Ling, C. S., Almeida, S. J., & Ho Su Wei. (2017). BNM Quarterly Buletin: Affordable Housing : Challenges and the Way Forward Q4. Retrieved from <http://www.bnm.gov.my/files/publication/qb/2017/Q4/p3ba1.pdf>
- Mohd Amin, M. A., Abas, N. H., Shahidan, S., Rahmat, M. H., Suhaini, N. A., Nagapan, S., & Abdul Rahim, R. (2017). A review on the current issues and barriers of Industrialised Building System (IBS) adoption in Malaysia’s construction industry. *IOP Conference Series: Materials Science and Engineering*, 271(1).
- Olanrewaju, A., Aziz, A. R. A., Tan, S. Y., Tat, L. L., & Mine, N. (2016). Market Analysis of Housing Shortages in Malaysia. *Procedia Engineering*, 164(June), 315–322.
- RI. (2018). Affordable Housing – The Game Plan Transformation. Petaling Jaya: REHDA Institute.
- The Sun Daily. (2018, February). Bank Negara to Reduce Affordable Housing Gap. *The Sun Daily*. Retrieved from <http://www.thesundaily.my/news/2018/02/14/bank-negara-reduce-affordable-housing-gap>

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**DIGITAL TRANSFORMATION AND EMPLOYMENT: WHERE WILL NEW JOBS BE CREATED?**

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**Abstract**

The Fourth Industrial Revolution has enormous potential for replacing jobs by robots and algorithms. While in the past physical labor and routine activities were replaced by machines and computers, now, for the first time, it is possible to substitute machines for human intelligence. Thanks to artificial intelligence and self-learning systems complex mental tasks can be performed by algorithms in a variety of different fields such as financial investment, medical diagnosis or traffic optimization. Therefore, less labor will be needed to produce goods and services and man jobs are likely to disappear. Forecasts clearly show that the additional demand for IT specialists will not come close to compensate for the predicted job losses. In this paper, we will analyze the expected change in employment and show, where new jobs are likely to appear. They will be related to an increasing complexity of many economic processes and lead to the emergence of a new bureaucracy.

**Keywords:** *digital transformation; technological progress; unemployment; bureaucracy; bullshit job.*

**1. INTRODUCTION**

The fourth industrial revolution has enormous potential for replacing currently existing jobs by robots and algorithms. While in past industrial revolutions machines mostly replaced muscle power of humans, digitalization will allow substituting capital also for the human mind. This process will be more dramatic than the process of automatization, which we observed since the 1960s. Automatization mainly described an ongoing development, where programming enabled computers to perform well-defined routine tasks. But digital transformation will allow computers, robots and algorithms in combination with big data to deal with increasingly complex and creative mental tasks in many domains such as trading financial products, logistics or traffic optimization.

Therefore, we expect "smart factories" to produce goods without directly involving human labor in the future. And many services are likely to be delivered with less and less human labor. In view of such forecasts, it is not surprising that potential job losses feature prominently in discussions about economic consequences of the fourth industrial revolution. Depending on data and assumptions, studies for the USA and the United Kingdom conclude that between 9 and 47 percent of all jobs are at risk (Arntz et al., 2016; Frey and Osborne, 2017; PWC, 2017). The Institute for Employment Research (IAB) in Nuremberg believes that 25 percent of jobs in Germany are likely to disappear (Dengler and Matthes, 2018). And in Switzerland it is expected that by 2030 around a fifth to a quarter of work activities will be replaced by robots and algorithms (Mc Kinsey, 2018). But no matter how large the percentage will be: it is commonly acknowledged that a wide range of jobs will eventually disappear.

The long-forgotten conflict between labor-saving technological progress and full employment will once again become apparent in the fourth industrial revolution. Therefore the question arises: where will people work in the future, if a large portion of currently existing jobs are expected to disappear?

Economists usually argue that technological progress in the past has always created a sufficient number of new jobs, which more than compensated for the destruction of old jobs. For if technological progress increases labor productivity and thus ultimately GDP per capita, then rising prosperity will at the same time boost demand for new goods and services. For example, a report by the Swiss Federal Council in March 2017 stated that in the past two decades about 350,000 jobs had been lost in Switzerland because of structural change, but that 860,000 jobs had been created during the same period. Therefore we should expect a similar development with respect to digital transformation, as long as we always adapt our education system to the new challenges associated with digitalization. So far economic history has proven optimists to be correct. There has never been mass unemployment in the history of capitalist economies in the longer run. High unemployment rates were the result of economic crises like the Great Depression in the USA at the beginning of the 1930s or the crisis in Greece after 2008 but not the result of labor saving technological progress. Nevertheless, many people wonder, where new jobs are supposed to be

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created in the future. The forecasts mentioned above make it clear that additional demand for IT specialists will not even come close to compensate for the expected job losses triggered by the digital transformation. In this paper we will demonstrate that many new jobs are also likely to be created during the fourth industrial revolution. But this will happen in rather unexpected ways.

## **2. BUREAUCRACY, BULLSHIT JOBS AND EMPLOYMENT**

Already during earlier phases of economic history, bureaucracy has significantly contributed to employment in capitalist economies. In the 19th century, the emergence of labor-intensive bureaucratic structures accompanied the process of industrialization. In England, bureaucracy during the first half of the 19th century was primarily associated with the administration of the army (Abramovitz and Eliasberg, 1957). But during the second half of the 19th century especially post services and the police provided employment for a growing number of civil servants.

The emergence of New Public Management (NPM) in the 1990s (e.g. Budäus (1994)) was an important trigger for a new wave of bureaucratization, that is all around us today. This seems paradoxical at first, because one of the main objectives of NPM was the replacement of the old bureaucratic, inefficient government by a modern, efficient and customer-oriented government. An efficient and lean public administration was supposed to be created with the help of management tools that were developed for private companies. It was assumed that government employees (civil servants) simply had to be given the right incentives in order to perform well. Rules and regulations, the classic instruments of the old bureaucracy were replaced by performance-oriented contracts and agreements.

If we look at politics since the 1990s, it is above all socialist governments that have advocated the idea of NPM. They had been throwing overboard their old ideas of class struggle, and the new enthusiasm for the market and competition spread by the Thatcher and Reagan governments in the USA and Great Britain in the 1980s came just at the right time. The performance and quality of government institutions was measured by an array of indicators and then a constant improvement was supposed to take place by incentivizing government employees accordingly (Binswanger, 2010, p. 44ff). The "socialist" successor of Margaret Thatcher, Tony Blair, led the way by trying to turn the previous bureaucratic state (or what was left of it after the Thatcher era) upside down with appropriate reforms. In the wake of Blair, the then Federal Chancellor Gerhard Schröder felt obliged to make NPM the standard program of "progressive socialists" in Germany under the euphemism "activating state". And also consulting firms like McKinsey jumped on the bandwagon. They now had the opportunity to "advise" governmental institutions such as universities and hospitals in order to make them fit for competition in a "pseudo market economy".

The permanent pressure to achieve measurable efficiency and measurable quality set in motion by the NPM turned out to create a whole array of new jobs. NPM became the trigger for a new bureaucracy based on controlling, evaluation and optimization, in which traditional rules and regulations were replaced by performance agreements and measurable goals. This is particularly evident in education, health care and research. Not surprisingly, it is in these areas that most jobs have been created since the 1990s in many countries. The health care system turned into a real job machine that more than compensated for job losses in other industries.

But the new bureaucracy is not only based on ideas that have emerged from NPM (e.g. Drechsler, 2008), nor is it limited to public administration. In addition to typically bureaucratic activities associated with administration, organization, monitoring, controlling, registration, documentation, evaluation or coding, it also includes activities such as certification, accreditation, consulting, coaching or mentoring. Trained specialists and experts usually carry out jobs in these domains. Sometimes they still operate under commonly known professional labels such as coders, consultants or controllers. However, we increasingly encounter specialists who, for example, call themselves "Data Facility Hierarchical Storage Manager", "Human Resources Management Consultant", "Regulatory Compliance Manager", "Regional Coordinator in Education Marketing" or "Freelance Certification Auditor". All these jobs sound very important but it is often difficult to guess what these people do.

The lack of meaning of many activities also motivated the anthropologist David Graeber (Graeber, 2018) to write a book about this phenomenon. He observed that in recent decades more and more so-called "bullshit jobs" had emerged in governmental as well as private organizations. Graeber refers to bullshit jobs as useless jobs whose actual meaning remains obscure and which nobody would miss, if they disappeared. According to Graeber, socially meaningful work, on the other hand, becomes increasingly scarce, because computers, algorithms or robots replace employees in these domains. Graeber's observation of an increase in "bullshit jobs" thus points to a central phenomenon in the current development of capitalist economies. There is an increasing number of jobs that no longer correspond to our traditional idea of meaningful activities, although they are often portrayed as important and innovative activities.

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However, it can be argued that the classification of a job as a meaningful activity or as a bullshit job is rather arbitrary. Graeber himself sees this problem as well (Graeber, 2013). One could also argue, he writes, that his job as a professor of anthropology is also a bullshit job. There is no objective way of assessing the social value of a specific job. It is not obvious where to draw the line between meaningful jobs and bullshit jobs. Graeber fails to provide any convincing criteria, which would allow for such a classification.

Despite of this ambiguity, many of us suspect that bullshit jobs actually exist and that they are often associated with bureaucracy. However, besides of being overwhelmed by the emergence of new bullshit jobs, we observe that traditionally meaningful jobs are turning into bullshit jobs as well (see Hamel and Zanini, 2017). For example, doctors and nurses in hospitals have less and less time for treating patients. Instead, time has to be spent on activities such as coding, documentation, controlling or monitoring. Scientists spend more of their time for acquiring projects, writing applications or reports or for evaluation of other projects, so there is little time left for research. And frequently research itself is also turning into a bullshit activity. Many research activities only serve the goal to produce a maximal number of publications in scientific journals or to receive research funds. The content of research, however, is usually of minor importance (Binswanger, 2010, pp. 140-179).

But why do bullshit jobs exist at all? What is the incentive to pay people for activities that do not result in obvious benefits? Graeber also fails to answer this question. Instead, he is puzzled by this fact and writes (Graeber, 2013): "It is, as if someone were out there inventing meaningless jobs just to keep us all working". Because it would actually be enough, if we only worked 3 to 4 hours a day. In an interview in the blog "Working In These Times" of May 10, 2018 Graeber states:

"Can one imagine a better proof of a stupid economic system than the fact that the prospect of the disappearance of boring and unpleasant jobs is seen as an economic problem? Any rational economic system would redistribute work so that everyone would have to work less."

But here Graeber fails to see an important point. The rationality of capitalist economies lies precisely in the fact that they also generate useless jobs in order to prevent increasingly productive economies from higher unemployment. This is how full employment can be maintained in spite of digitalization. If, on the other hand, we all started to work less, as Graeber imagines, this would require a new distribution of labour. In this case people would translate labour-saving technical progress into more leisure time and less work. The remaining meaningful jobs would be distributed among more people with shorter working hours but also lower incomes. But in this case, aggregate income will stagnate or fall, and so will consumption. Companies then begin to make losses, and the economy inevitably falls into a downward spiral.

Keynes had already mistakenly predicted such a decline in working hours in his 1930 essay "The economic possibilities of our grandchildren" (Keynes, 1930). Keynes believed that a hundred years later, around 2030, people would be able to satisfy their material needs with a fraction of their working hours. They would then only have to work three hours a day and would have more time for leisure. This would enable people to do more meaningful and enjoyable work. Today, the year 2030 is not far any more, but we still work considerably more than 3 hours a day. Average weekly working hours have fallen since the 1930s from around 50 hours to 40 hours, but that was it. Since the 1980s, average working hours have hardly fallen any more (Skidelsky and Skidelsky, 2013, p. 35 ff.). The main reason for Keynes' miscalculation is that he did not see the need for growth in capitalist economies and instead assumed that the economy would stagnate at some point once most people's material needs are satisfied (Binswanger, 2019).

The quest for growth prevents higher labor productivity from being translated into more leisure time. Therefore, there is an increasing need for a bureaucracy capable of guaranteeing full employment, even if it is associated with bullshit jobs. However, we do not find any job advertisements where people are hired in order to increase bureaucracy or to do meaningless work. The demand for most of these jobs results from the increasing bureaucracy itself. Bureaucracy always breeds more bureaucracy. Many people would probably agree that the profession of a certification auditor qualifies as a bullshit job. Certification systems, however, are part of the new bureaucracy and are supposed to guarantee that quality standards are met in companies or public organizations. It is believed that certified companies or organizations will perform better because there they have introduced measures to ensure quality. But the process of certification only works if there are also trained certification auditors. Once certification systems are introduced, certification auditors become a necessary part of the economy.

### **3. CONCLUSION**

The digital transformation of the economy will cause many job losses, as is predicted by forecasts for several countries. However, this transformation is also associated with a new wave of bureaucracy, which creates a variety of new jobs including

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so-called bullshit jobs. This development is already obvious in many countries especially in domains such as health care or education. Therefore, we are not likely to see a substantial increase in unemployment figures in the next decades. It is true that considerably less people will be involved in production of goods and also some services. But at the same time, the economy becomes increasingly complex, which requires new jobs for dealing with this complexity. Overall, the resulting increase in bureaucracy will be labor-intensive and compensate for the job losses caused by the digital transformation. This is the good news. The bad news is an increase in rather meaningless activities, which lead to more controlling, evaluation and regulation.

## REFERENCES

- Abramovitz, M. and Eliasberg, V.F. (1957). Government in Nineteenth Century Great Britain. In: Moses Abramovitz and Vera F. Eliasberg The Growth of Public Employment in Great Britain. Princeton University Press. S. 8-23.
- Arntz, M., Gregory, T., Zierahn, U. (2016). The Risk of Automation for Jobs in OECD Countries. OECD Social, Employment and Migration Working Papers No. 189. Paris.
- Binswanger, M. (2010). Sinnlose Wettbewerbe – Warum wir immer mehr Unsinn produzieren. Herder Verlag, Freiburg.
- Binswanger, M. (2019). Der Wachstumszwang – Warum die Volkswirtschaft stets weiterwachsen muss, selbst wenn wir genug haben. Wiley Verlag, Weinheim.
- Budäus, D. (1994). Public Management. Konzepte und Verfahren zur Modernisierung öffentlicher Verwaltungen. (= Modernisierung des öffentlichen Sektors. Band 2). Berlin 1994.
- Dengler, K. und Matthes, B. (2018). Substituierbarkeitspotenziale von Berufen. Wenige Berufsbilder halten mit der Digitalisierung Schritt. IAB Kurzbericht 4/2018.
- Drechsler, W. (2008). Aufstieg und Untergang des New Public Management. Kurswechsel 2/2008, S. 17-26.
- Frey, C. and Osborne (2017). The future of employment: How susceptible are jobs to computerisation? Technological Forecasting and Social Change, 2017, vol. 114, issue C, 254-280.
- Graeber, D. (2013). On the Phenomenon of Bullshit Jobs: A Work Rant. Strike Magazine, Issue 3, August. Graeber, D. (2018). Bullshit Jobs: A Theory. Allen Lane.
- Hamel, G. and Zanini, M. (2017). What We Learned About Bureaucracy from 7,000 HBR Readers. Harvard Business Review, August 10th.
- Keynes, J. M. (1930), Economic Possibilities for our Grandchildren. in: Essays in Persuasion, New York: W.W.Norton & Co., 1963, pp. 358-373.
- McKinsey (2018). The Future of Work. Switzerland's Digital Opportunity. McKinsey&Company Switzerland. PWC (2017). Will robots steal our jobs? The potential impact of automation on the UK and other major economies. UK Economic Outlook March 2017. S. 31-47.
- Skidelsky, R. and Skidelsky, E. (2012): How Much is Enough? Money and the Good Life, New York, NY, USA

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**CULTURAL TRANSFORMATION THROUGH DIGITAL MEDIA:  
RECEPTION ANALYSIS AGAINST VIOLENCE AND SEXUALITY ON SASUSAKU FANFICTION**

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**Abstract**

In Naruto Anime characters there are Sasuke and Sakura couples who get the nickname of the Sasusaku couple have many fans. They produce fanfiction with various types and genres that apparently were encountered that have elements of violence and sexuality in it. This study uses a reception analysis belongs to Stuart Hall who saw the active audience in understanding the basis of their experience personal text. Audiences were divided into three groups based on their meaning, which is the dominant hegemony audience, an audience of negotiations, and the audience of the opposition. Researchers interviewing respondents were selected through purposive sampling with a sample fanfiction show entitled "Little Secret (End) chapter 1-5 written by Rina Afna and published on Wattpad. It is concluded that the respondents put themselves in a dominant position of hegemony agree and are not concerned with the existence of these two elements because it considers it as an amplifier dynamics and seasoning storyline. At the negotiating position of respondents to negotiate with the ideal age limit fanfiction reader, conformity with the original story, and sexuality education. Meanwhile, the position of the respondents rejected the opposition with violence and sexuality because they do not have a positive value and is not appropriate for consumption. The researchers also explain the background of the respondents' ideology in defining and positioning itself against fanfiction Sasusaku.

**Keywords:** *anime, Naruto, Sasusaku, fanfiction, violence, sexuality, reception analysis*

**1. BACKGROUND**

The popularity of Manga and Anime in Indonesia began to be felt in the '90s. It can be seen through the number of television channels at that time that broadcast anime. Anime soundtrack that became favorite songs, books, comics, toys or Japan is also a favorite of children in the mass [1].

One of the popular anime Naruto anime masterpiece is Masashi Kishimoto. For about sixteen years of broadcast received Anime rating 8.2 / 10 from www.imdb.com [2]. The anime began airing in Japan on TV Tokyo television stations from 2002 to date and has had two sequels, namely: Naruto Shippuden and Naruto Next Generation. While in Indonesia, Naruto anime first aired on television station Trans TV, but then stopped and broadcast by GTV. In addition to the Naruto anime television can also be viewed online or downloaded for free with subtitle Indonesian language on the website www.samehadaku.tv and animeindo.video. Naruto anime aired on TV screens and websites make this anime is widely known by the people of Indonesia [3]. Among the many characters in the Naruto world that has the most fans are a couple Uchiha Sasuke and Haruno Sakura or abbreviate his fans to "SasuSaku". Liveliness can be proved by the many fansfans account SasuSaku fan or Instagram account. Such accounts include: @sasukesakuras, @sasusaky, and @ssakura\_x. As in this case fans are individuals who interpret a culture. Where the meaning will be different depending on each individual to interpret, based on the intellectually and emotionally [4].

The content of the SasuSaku fan account posting on Instagram is broadly filled with fanfiction. Fanfiction is the result of creative productions from fans that are based on disinterest in the original storyline written by the original author of a comic (manga), anime, film, novel or music that is popular. Fans will repeat the original plot with the path they want, but the characters and story settings and story background follow the original work [5]. The reason many fanfiction contents is for fans SasuSaku SasuSaku assume Studio Pierrot has made a different storyline from the manga Naruto anime, especially in the SasuSaku. Studio Pierrot has claimed many omit important parts SasuSaku. Dissatisfaction is what makes SasuSaku fans express themselves by creating a storyline SasuSaku according to what they want and desire by making such fanfiction and fanart images of comic book or story short stories, cerbung, and novel.

Among the many genres fanfiction SasuSaku, that interest is the genre of violence and sexuality in SasuSaku fanfiction. Be interesting because the love story of Manga and Anime Sasuke and Sakura does not refer to anything that smells of sexuality. Although, for the genre violence can not be denied the scene of violence between Sakura and Sasuke never happened in one

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of the scenes in episode 214, where Sasuke tried to kill Sakura is a girl who loves him for it. Here, researchers will focus on the elements of violence and sexuality depicted on SasuSaku fanfiction.

## **2. RESEARCH METHODS**

This research is the analysis of the reception, which focuses on the fact that the audience is active. Besides, it also analyzes the reception will be in line with the theory of encoding and decoding Stuart Hall and reception theory from McQuail. Both theories are walking hand in hand stated that the meaning of the audience towards something will be different depending on the background of viewpoints, experiences, and cultural context of each audience.

In the context of this study, the audience is a fan SasuSaku which consumes fanfiction. Where in this study, researchers will analyze the meaning of fans against violence and sexuality in fanfiction SasuSaku a different perspective and experience, as well as the cultural context of each fan.

In this study, a fan categorized into three positions, namely: first, the hegemony of the dominant group, where the audience on these groups interpret the message according to what is meant by media that produces the message. Secondly, the group negotiating position, where the audience in this group can accept the meaning given by the media, but also provide its own interpretation of the media message. Third, the position of the Opposition, the audience in this group interpret the message is the opposite of the expected media [6].

In this study, researchers will be interviewed in depth eight respondents. Researchers adhering to the draft questionnaires is provided before the interview begins. Every interview conducted, will be recorded and transcribed accurately, so that researchers will be able to interpret the information obtained from the respondents.

Researchers prepare samples fanfiction in accordance with the focus of research, namely fanfiction with violence and sexuality in the form of serialize (cerbung). The sample titled "Little Secret (End)" chapters one through five were written by Rina Afina and published on Wattpad has been read as many as 347 000 times.

## **3. DISCUSSION**

### *Fan Reception on Violence in Fanfiction SasuSaku*

This section will explain the analysis of data from the previous chapter, is associated with the reception of fans against violence fanfiction SasuSaku. This section will detail the meaning of each fan to Violence in fanfiction SasuSaku using reception theory, which is based on the theory, fans will be grouped in three groups based on their meaning. Three groups were dominant hegemony audience, an audience of negotiations, and the audience of the opposition. Keep in mind that the eight respondents find voice one violent elements in samples SasuSaku fanfiction called "Little Secret (End)" on capter 1-5 written by Rina Afina and published on Wattpad has been read as many as 347 000 times.

#### *Dominant hegemony position*

The dominant position is a position of hegemony audience interpret the meaning of the message is appropriate or consistent with the message producer, and displays the acceptance or approval will be the message [6].

In harmony with the theory of hegemony of the dominant position of the audience, in this case, the message is fanfiction SasuSaku discussed. Information gleaned from interviews with eight of the respondents, explaining that only one of the respondents who indicate or characterize approval abusive messages.

Respondents are Syauqi, acknowledges that in fanfiction that she encountered there are often scenes of violence in the form of kicking, slapping, pulling, or even biting, violence is included into physical violence, where physical violence is an act of injure violence or physical harm victims [7]

The element of fan violence is also considered a normal thing happens on a fanfiction. Even is a necessity that will make the story more dynamic. So that such violence does not become a problem when reading or enjoying fanfiction, in this case SasuSaku fanfiction. It does not escape from the fact that fanfiction goal made. Listening to write fanfiction is to write stories that they like and liking them [8]. Thus, it is possible that their favorite is fanfiction with violence. Reception theory see the audience is active in this case is the intended audience of fans. Fans enjoy the consumption process text in accordance with

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their preferences. Because, they rework the text becomes a very fun for them and very satisfying for their consumption [8]. The results if the text can be either fanfiction.

#### *Negotiating position*

Negotiating position is a position where the audience receives the meaning of the message conveyed by the media by adding or provide their own interpretation based on the experience of each audience [6]. In short, the audience not only swallow the message conveyed by the media, but also weigh the positive and negative sides of the messages conveyed by way of justifying in part the meaning of the message and reject most of the other meanings.

Information obtained from eight respondents indicated that four of them are the audience with the negotiating positions of the elements of violence in fanfiction SasuSaku, four respondents are Ghifary, Diah, Shifak, and Ari.

Listening give their negotiations towards two themes *fanfiction* SasuSaku abusive. The first fans were negotiating with the appropriate age restrictions for the readers. The reader is brought deemed not mature enough age to consume fanfiction violent wisely. Because, violence includes measures diverge, such as: actions that damage, the violation of which exceeds the limit, the act unjust, reproach, disrespect, insult, defame, weaken, abuse, attack and disrupt [7]. Writers usually write fanfiction genre and age restrictions on the home page fanfiction, but it certainly cannot rule out the possibility that their readers under the age of reckless read the fanfiction.

Secondly, fans stated that it was not a problem for them to read fanfiction which contained elements of violence as long as these elements were still in line with the original storyline in the Naruto anime series. As we know Fanfiction or commonly abbreviated as fanfic is a literary genre written by fans based on existing literary works. Such as novels, films, or television shows, without the permission of the original author of the literature. In this case fans extend the original story both the character and the setting of the story. Fans write fanfiction to make the stories they like according to their wishes [8]. Listening is also admitted in the anime series does contain elements of violence. Moreover, covered here are Sasuke and Sakura, where scenes of violence between the couple never happened in 214 episodes of Naruto Shippuden Sasuke attacking display scene and intend to kill Sakura, but failed to do because of the arrival of Naruto separating their dispute.

#### *Opposition position*

Audience with the opposition position is the audience who refused the message conveyed by the media, these audience groups interpret the message in the opposite [6]. In short, the position of the opposition is the antithesis of the dominant position of hegemony. There are three among the eight respondents who are in a position of opposition. They are Handri, Meutiara, and Zulfa.

Violence is a word with negative connotations and meanings that make some fans strongly reject these elements for consumption. Violence (including clashes, riots and fights) in its manifestations is something that is destructive [9]. Whereas according to the KBBI online, violence is an act of a person or group that causes physical or other people's damage [10].

Being a big fan of SasuSaku though, also cannot justify to include elements of violence *fanfiction* SasuSaku. Although it is undeniable that fanfiction is also a fan of creative production that is based on dissatisfaction on the original story written by the original authors [11]. The violence that respondents found the form of verbal abuse and sexual violence. Verbal violence here is an instrument or a part of psychological violence / mental. As we know, emotional violence is violence that attacks the psychological victim, the instrument can be verbal violence [7]. Moreover, psychological violence can be a rant, brainwash, intimidation, bullying, character assassination, and so on. Meanwhile, sexual violence is the imposition of either action or utterance to another person to perform activities of a sexual nature. Where sexual activity was found by the respondent in SasuSaku fanfiction is a rape scene.

The results of the above descriptions are a fan reception to violence in fanfiction SasuSaku, from the reception analysis it can be concluded that in line with the theory of encoding / decoding raised Hall, reception theory suggests that the activity of the audience to read text, and gives its own meaning based on their experience. Audience in this case is a fan. Fans of the three groups that reception, giving meaning and reason for their position based on their own experience. Hegemony Dominant fan with his opinion stating that the violent elements necessary for the dynamics of a fanfiction story. Negotiations fan negotiate with fanfiction reader age requirements and compliance with the original story.

#### ***Fan reception on sexuality in SasuSaku fanfiction***

This section will explain the analysis of data from the previous chapter, is associated with the reception of fans towards sexuality in *fanfiction* SasuSaku.

#### *Dominant hegemony position*

The dominant position is a position of hegemony audience interpret the meaning of the message is appropriate or consistent with the message producer, and displays the acceptance or approval will be the message [6]. In connection with the element

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of sexuality, of the eight respondents interviewed two respondents put themselves in a dominant position which Handri and Syauqi hegemony.

Most fans explained that there are two things that make them stand in a dominant position hegemony. The first is that they enjoy the scene content or element of sexuality *fanfiction* SasuSaku that are vulgar, fans also make natural that because of his position as a man, means that there will be various aspects of sexuality terms ranging from sexual pleasure as well as mention of gender. It is then consistent with the statement that sexuality has a very broad meaning, including sex, gender, sexual orientation, eroticism, pleasure, intimacy and reproduction [12].

Second, fans interpret the element of sexuality as complementary seasonings dynamics in the story *fanfiction*, Sexuality can not be denied is an inseparable aspect of life, by incorporating elements of sexuality in a storyline would make the storyline more flow in line with the realities of life. Sexuality can also be interpreted socially constructed reality and the same in every person. Sexuality is created by culture by defining some of the behaviors associated with sexual and studied with scripts that exist in society [13].

#### *Negotiating position*

Negotiating position is a position where the audience receives the meaning of the message conveyed by the media by adding or provide their own interpretation based on the experience of each audience [6]. In short, the audience not only swallow the message conveyed by the media, but also weigh the positive and negative sides of the messages conveyed by way of justifying in part the meaning of the message and reject most of the other meanings. Information obtained from eight respondents indicated that the two of them is an audience with the negotiating positions of the elements of sexuality in *fanfiction* SasuSaku, they are Ghifary and Shifak.

Just like on the negotiation position on points of violence, fans of the points sexuality also assume that *fanfiction* SasuSaku that contains elements of sexuality are not intended to be consumed reader minors. Terms ideal for readers age limit should be given the minimum limit. The purpose of the age limit with regard to the psychological aspects (cognition, emotion, motivation, and behavior) [14]. The psychological aspects can be tangible and impact on the good or bad behavior in real life. So the emotional maturity necessary for the reader to consume that content, which can be a benchmark age of maturity of the individual.

Further, as an example of bad behavior that can be realized is a distorted interpretation of sexuality that leads to deviant sex acts and inappropriate, because motivated after seeing the content of the text, in this case *fanfiction* SasuSaku.

Nevertheless, the element of sexuality *fanfiction* SasuSaku can also meaningful for both, associated with sexual education and the role and gender identity to the reader, by reading *fanfiction* containing elements of sexuality, then the reader will be able to learn the identity of gender roles between women and men which are embodied in human biological activity. Biologically sexuality can be defined as the union of two distinct elements, between men and women: the sperm and ovum [15]. Besides, reading *fanfiction* Sexuality SasuSaku containing elements can also provide an overview of sexual orientation to its readers.

#### *Opposition position*

Audience with the opposition position is the audience who refused the message conveyed by the media, these audience groups interpret the message in the opposite [6]. In short, the position of the opposition is the antithesis of the dominant position of hegemony. There are three among the eight respondents who are in a position of opposition. They are Meutiara, Diah, and Zulfa.

Scenes of sexuality displayed on SasuSaku *fanfiction* here is considered very vulgar and described in great detail. Audiences at this position only discuss and emphasize the biological aspects of human sexuality as embodied in the bed scene SasuSaku. The scene is considered highly inappropriate for inclusion in a *fanfiction*. Although as we all know, that *fanfiction* is a creative work of fan written based on their favorite [16]. Did not rule out despite SasuSaku fellow fans, but they have a distinctive taste, so it may cause disagreements, tangible lazy or reluctant to read *fanfiction* SasuSaku containing elements of sexuality. It is also due to fans of the individuals who are doing meaning of a cultural product.

The results of the above descriptions are a fan reception of sexuality in *fanfiction* SasuSaku, from the reception analysis it can be concluded that in line with the theory of encoding / decoding raised Hall, reception theory suggests that the activity of the audience to read text, and gives its own meaning based on their experience. Audience in this case is a fan. Fans of the three groups that reception, giving meaning and reason for their position based on their own experience. Hegemony Dominant fan with his opinion stating that the sexuality elements necessary for the dynamics of a *fanfiction* story, taking it also can give pleasure for the audience. Negotiations fan negotiate the terms of age and educational sexuality *fanfiction* reader.

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#### 4. CONCLUSION

The analysis of this reception briefly describes the activity of the audience in this case is a fan of fanfiction SasuSaku in meaning as a result of creative work of fans written by the original author's work with violence and sexuality. After conducting interviews with the respondents as a fan of SasuSaku eighth, one respondent stated that fanfiction SasuSaku sound contains elements of violence and sexuality.

Nevertheless, respondents as fans put themselves in different positions within the meaning of violence and sexuality contained in SasuSaku fanfiction. Where, in accordance with the reception theory put forward by Stuart Hall, the audience divided into three groups, namely, audience dominant hegemony, negotiations audience, and the audience of the opposition. Meaning the position is influenced by social, cultural, and experience of the audience. SasuSaku fan in this study also gives meaning and their position against fanfiction SasuSaku violent and fanfiction SasuSaku containing Sexuality. As for the meaning of the fans SasuSaku, as follows:

##### *Fan reception for fanfiction SasuSaku which contains violence and sexuality*

- Dominant Hegemony Position - Dominant hegemony position occupied by fans who saw the violence and sexual content as a necessary element in fanfiction to shape the dynamics of the story. In addition, the element of sexuality in fanfiction SasuSaku give pleasure for most fans.
- Negotiating Position - Negotiating position is occupied by fans who consider or negotiate associated with elements of violence and sexuality contained in SasuSaku fanfiction. Whereas, violence and sexual content may only be consumed if the reader is of age or already on the ideal age limit to consume fanfiction containing violence and sexuality. In addition, fans see if the violence and sexuality may be added in fanfiction story line only if it complies with original story line or not to deviate from the original books. Especially for fans sexuality element at this position not only see the bad side of sexuality, even more so when viewed from the bright side, the reader can make fanfiction containing sexuality as a venue for sexuality education.
- Opposition Position - Listening to this position reject violence in fanfiction SasuSaku, where they think violence does not have a positive value. Listening assume fanfiction SasuSaku with elements of violence and sexuality can be consumed freely in various platforms, without knowing the identity or age of the fans who consume them. Omitting these two elements is the wise thing because it can be a preventive measure. Moreover, fanfiction still could be an interesting story without slipping or include both elements in a plot.

The three meaningful positions according to Stuart Hall are influenced by the ideology or way of thinking and socio-culture that is owned by each audience. Starting from the factors of family, environment, education, and hobbies.

#### REFERENCES

- [1] [1]. Permana, A. (2014). Studies jkt48 as pop culture fandom. journal Commonline *Communications Department* ., Vol. 3, No. 3, 445-446. Taken from <http://journal.unair.ac.id/COMN@study-fandom-jkt48-as-pop-culture-article-8143-137-medium-category-8.html>. (Accessed on January 17, 2018).
- [2] [2]. Naruto. 2018. Taken from <http://www.imdb.com/title/tt0409591/>. (Accessed on 15 January 2018).
- [3] [3]. GrandC. 2015. Global TV Naruto Create Group Trans TV Inflamed !. Taken from <https://www.duniaku.net/2015/06/06/naruto-global-tv-trans-tv/>. (Accessed on 15 January 2018).
- [4] [4]. Fulamah, F N. (2015). Identity Construction Group Listening (Fandom) Fanfiction Among Urban Youth, *Journal of Educational Psychology and Development*, Vol. 4 No. 3, 376 - 394. Taken from <http://journal.unair.ac.id/download-fullpapers-lnbc9ef9fa7afull.pdf>, (Accessed on January 16, 2018).
- [5] [5]. Puspitasari, W & Hermawan, Y. (2013). Lifestyle Enthusiasts K-Pop (Culture Korea) in Expressing Life Case Studies K-Pop Lovers in Surakarta. *Sociality: Scientific Journal of Educational Sociology Anthropology*. Vol. 3, No. 1, 2013, 4. Taken from <https://eprints.uns.ac.id/1194/1/1708-3813-1-SM.pdf>, (Accessed on March 22 2018).
- [6] [6]. During, Simon. Ed. (2007). *The Cultural Studies Reader*. London, United Kingdom: Routledge. Taken from: <https://faculty.georgetown.edu/irvinem/theory/SH-Encoding-Decoding.pdf>. (Accessed on April 11, 2018).
- [7] [7]. Eller, Jack David. (2006). *Violence and Culture: A cross-cultural and Interdisciplinary Approach*. United States of America: Thomson Wadsworth.
- [8] [8]. Ott, Brian L & Mack, Robert L. (2014). *Critical Media Studies: An Introduction Second Editions*, Malaysia: Ho Printing (M) Sdn Bhd.

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*E-Proceedings of 2<sup>nd</sup> Connect-Us Conference (CuC 2019)*  
*Digital Transformation – Opportunities and Challenges*

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- [9] [9]. Rahmawati, Arifah. Et al. (2006). Nonviolent Resistance Stories of Regional Konflik Indonesia, Yogyakarta: Books CSPs.
- [10] [10].KBBi online. (2018). Hard. Taken from <https://kbbi.web.id/keras>. (Accessed on April 13 2018).
- [11] [11]. Fulamah, F N. (2015). Identity Construction Group Listening (Fandom) Fanfiction Among Urban Youth, *Journal of Educational Psychology and Development*, Vol. 4 No. 3, 376 - 394. Taken from <http://journal.unair.ac.id/download-fullpapers-lnbc9ef9fa7afull.pdf>, (Accessed on January 16, 2018).
- [12] [12], Network Color Styles Lantern Indonesia, (2016). Books and Sexual Health and Rights *Reproduksi GWLmuda*. Taken from [http://www.gwl-ina.or.id/buku-kesehatan-dan-Sexual rights-and-reproduction-teengwl/](http://www.gwl-ina.or.id/buku-kesehatan-dan-Sexual%20rights-and-reproduction-teengwl/). (Accessed on April 3, 2018).
- [13] [13]. Demartoto, A. (2010). Understood, Understanding and Accepting Homosexuality phenomenon. *Journal of Sociology*, State University of Surakarta. 4-6. Taken from <http://argyo.staff.uns.ac.id/files/2010/08/seksualitas-undip.pdf>. (Retrieved 14 April 2018)
- [14] [14]. Indonesian Family Planning Association Special Region of Yogyakarta (DIY IPPA). *Sexuality*. Taken from <https://pkbi-diy.info/seksualitas/>. (Accessed on 29 January 2019).
- [15] [15]. Junaidi, Dawn, et al. (2010). *Miss V and Mr. Media*. Yogyakarta: UII Press.
- [16] [16]. Fachrazi, MFP (2016). Judicial review work fanfiction (Fiction *Listening*) *According to Law No. 28 2014 About Copyright*, (Published bachelor's thesis). University Hasanuddin. Taken from <https://core.ac.uk/download/pdf/77625386.pdf>, (Accessed on 20 April 2018).
- [17] [17]. Jenkins, Henry. (1992). *Textual Poacher: Television Fans and Participatory Culture*. Great Britain: Routledge, Chapman and Hall, Inc.

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**THE EVALUATION ON THE ABILITY TO ACHIEVE EFFICIENCY: A CASE  
ANALYSIS OF FREIGHT FORWARDING FIRMS IN VIETNAM**

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**Abstract**

The study presents factors affecting efficiency in providing services. The efficiency in providing service delivery, in detail, is not high to compete with multinational companies which are strong potential in finance aspect. Additionally, several studies on freight forwarding which focus on mainly qualitative research and other studies are in-depth analysis logistics. This study therefore, has used factor analysis method and Binary regression model (Binary Logistics) and identified factors that affect the efficiency in providing service of freight forwarding firms, namely business resources, outcomes, the quality of staffs. It is found that the relationship between enterprises, customers, and outcomes is the factor providing the highest positive correlation to the ability to achieve efficiency in providing services of freight forwarding firms.

**Keywords:** *achieving efficiency; freight forwarding; binary logistics.*

**1. INTRODUCTION**

Most domestic firms are the availability and exploitation of the small stage in the entire chain of value-added logistics services. Freight forwarding services in Vietnam are mostly traditional services, including transportation, warehousing, customs declaration, and delivery. These activities are derived from the scale of production of small firms, depended heavily on foreign countries (Banomyong *et al.*, 2015).

There are some researches that referred to this issue; however, the paper referred forwarding activities limited in number. Opportunities in IT systems reach beyond organizational boundaries according to Venkatraman (Venkatraman, 1994). These previous studies have urgency and high reference for the forwarding industry in Vietnam.

This research, therefore, reveals some core factors of how to impact the ability to the efficiency in providing service of freight forwarding companies contributing to the competitiveness of Vietnam freight forwarding firms. Section four focuses on discussion and indicates future lines of research. Finally, section five provides the main conclusions, identifies some limitations.

**2. THEORETICAL BACKGROUND**

***Economic efficiency and efficiency in providing service***

The economic efficiency of a phenomenon or an economic process is an economic category reflecting the level of use of resources, including human resources, financial to achieve the target (Griesinger, 1990; Wahab, 2011). Indeed, the economic efficiency expresses of quality of business operations, reflecting the use of resources such as raw materials, machinery, labor, capital to achieve the ultimate goal of all business operations of the maximize profits target.

To evaluate the economic efficiency of a business, there are two methods used, financial measurements and non-financial measurements (Zou, 1998). These financial measurements utilize to measure the performance of the business based on the relationship between benefits and costs money. The study evaluates the economic efficiency based on non-financial measurements, especially the evaluation of customers for service providers.

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***The resources of the enterprises***

Resources of the enterprises include many different factors such as properties, capabilities, organizational processes, which controls forming and implementing strategies to improve their efficiency. The resources of enterprises, including many factors, which are classified into three types of categories such as physical capital resources, the resources of human capital and organizational capital resources (Becker, 1974; Williamson, 1975). Besides, the construction of information technology to meet the trend of e-commerce and e-documents to use in forwarding services increasingly popular, so the application of e-commerce in services will impact positively on the efficiency of the service providers (Paul *et al.*, 200). Therefore, the hypothesis H1 was presented:

H1: The resources of the enterprises impact positively on the ability to achieve efficiency in providing service delivery.

***Outcomes***

In this study, the scale was based on the scale SERVPERF (Cronin, 2000) and ROPMIS scale (Thai, 2008). The results of the services required to ensure the accuracy, consistency, diversity, and speed of service. Therefore, the accuracy of the documents is one of the basic features that enterprises need to ensure delivery service provider with quality and efficiency (Parasuraman, 1988). Besides, performing services in a consistent manner is essential to achieve the level of efficiency in service delivery. Therefore, the hypothesis H2 was presented:

H2: Outcomes impacts positively on the ability to achieve efficiency in providing service delivery.

***Quality of the staff/employees***

Quality of the staffs is the level that staffs meet the needs and expectations of customers (Lewis *et al.*, 1990). Quality of staffs was used in the scale and quality of service on the ability of employees in the process of providing services by Homburg & Stock (2005). Specifically, in the freight forwarding services, staff are directly exchange agreements with customers, understand their requirements so that handling requirements most effectively. The process performing services of the staffs presents quality of services. The staffs are directly engaged in processing and services (Thai, 2007). Professional qualification of the staff is an important factor in the process of implementing the service. The staff/employees, staff attitude have a good level of new business can do good service processes and give customers confidence in the professionalism of the service that customers used (Parasuraman *et al.*, 1988; Homburg *et al.*, 2005). Therefore, hypothesis H3 was presented:

H3: Quality of staffs impacts positively on the ability to achieve efficiency in providing service delivery.

***The price of services***

For consumers, the price is considered as the awareness of consumers about the abandonment or sacrifice something else to own a product or a specific service (Zeithaml, 1988). This study will define and measure the value perceived by consumers because this is the price be interpreted in ways the most meaningful to them Price is always a factor to be taken into consideration when customers choose to use the services of the company.

Besides, the convenience in paying the price is also a factor in the increase in the value perceived by the customer for the service price. Discount prices depend on the specific pricing strategies of enterprises but also a strategy to retain customers in the future (Banomyong, 2011). Therefore, hypothesis H4 was presented:

H4: The price of services impacts positively on the ability to achieve efficiency in providing service delivery.

***The relationship between enterprises and customers***

The relationship between customers and suppliers is the commitment and mutual interaction between the parties oriented experienced a period of coherence between the two parties (Snehota *et al.*, 1995). The relationship between enterprises and customers is one of the strategies to develop long-term business, increase profits in fierce competition. The factors of shared value expressed concern and care to each individual customer as part of the core business to make a success of the service provider is the human factor (Parasuraman *et al.*, 1988; Banomyong *et al.*, 2011; Holdford *et al.*, 2001). Then, hypothesis H5 was presented:

H5: The relationship between customers and suppliers impacts positively on the ability to achieve efficiency in providing service delivery.

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### 3. METHODOLOGY AND RESULTS

Data were collected through two forms such as direct survey and online survey by email, respondents are staffs of enterprises that regularly use freight forwarding services company nationwide. Accordingly, the sample size is 5:1 (Hair *et al.*, 1998) based on the number of variables. The final sample size is  $n = 135$ . Industry active customer focused mainly garment textiles (23.8%), chemicals (11.3%), leather & footwear materials (20.7%), electronics (17.9%), machinery (16.8%) and other sectors. From the theoretical basis, the domestic and international research concerning the use and delivery of services firms, research using Binary Logistic regression models identified factor impacting positively on the ability to achieve efficiency in providing service delivery by the model:

$$P_i = E(Y=1/X_i) = \beta_0 + \sum \beta_i X_i$$

$P_i$ : the probability of the ability to achieve efficiency in providing service ( $Y = 1$ );  $\beta_1, \beta_2, \dots, \beta_k$ : the regression coefficients;  $X_i$  ( $i = 1, 2, \dots, k$ ): the independent variable

The dependent variable referred to the ability to achieve effective delivery of services that businesses provide to customers, taking value 1 if effective and 0 if not effective. The effective of forwarding service is defined as the resource integration of technology and human resource in order to give high quality to customer and optimize the customer satisfaction and get the better feedback from the customer and lead to the better company's revenue and profit; therefore, increase the competitive advantage for forwarding company (Scott *et al.*, 1989). All independent variables were measured on a scale from 1 to 5 (1- completely disagree, 2 - disagree; 3 - neutral; 4- agree, 5 - strongly agree).

With the number of samples collected, the authors conducted testing the reliability of the scale through the Cronbach alpha reliability coefficient. The variables that are not suitably removed before analysis to explore factors (EFA) because they can create false factors when analyzing EFA.

Inspection Cronbach alpha of each element represents all elements Cronbach alpha  $> 0.6$  and the correlation coefficient variables - total  $> 0.3$ , 18 variables were initially accepted and included in the next distribution (Nunnally, 1994)

Factor analysis is done by exploring methods for analysis of the main factor (Principal Component Analysis - PCA) with varimax rotation. This is the most common using (Meyers *et al.*, 2000) and load factor was chosen as 0.5. The results showed that original 18 observed variables are grouped into five factors, including variables GC15 disqualified because of loading factor  $< 0.5$  (Hair *et al.*, 1988), the index KMO = 0.844 and valued at a total variance explained is 59,199%  $> 50\%$  (satisfactory). To analyze 5 factors NL, KQ, NV, GC, and QH affect efficiency service provider or not, Binary Logistics regression model was used with the significant statistics  $\alpha = 5\%$ .

Results Binary Logistics regression analysis method showed that 5 components NL, DD, NV, GC, and QH positive influence to achieve efficiency in providing service delivery of domestic enterprises.

Results showed the ability to achieve efficiency in providing service delivery with p values less than significance  $\alpha = 0.05$ . Therefore, the model has significant research. In such, factor GC has p-value Sig. = 0.521  $> 0.05$ , there is no meaningful research.

Binary Logistics regression equation is based on the results:

$$\text{Loge } [P(Y=1)] = -32.413 + 3.950 * KQ + 1.548 * NL + 2.227 * QT + 1.908 * QH$$

$$P(Y=0)$$

Binary Logistic regression showed that factor KQ impacts positively the probability of maximum efficiency. This shows that, when the results of the implementation of the business increased by 1 unit, while other factors constant, the odds (probability to ability efficiency/ probability to ability inefficiency) the ability efficiency will increase to 3,950 units. Similarly, the factor of quality resources or personnel increased by 1 unit when other factors constant, the odds of ability effectively increase respectively 1,548 and 2,227 units.

Forecasting the probability of achieving efficiency based on the model.

Based on the average values of the variables studied, the probability of achieving efficiency is predicted: Suppose a firm has the resources to provide services is 3.35, the outcome is 3.66, quality of the staffs is 3.59 and the relationship with customers is 3.40.

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Binary Logistic model showed the probability of business efficiency is 72.5%. Thus, at the level of resources to provide services is 3.35, the outcome is 3.66, quality of the staffs is 3.59 and the relationship with customers is 3.40, shows that enterprises operate efficiently. Value prediction accuracy of the model is 93.3%.

#### **4. DISCUSSIONS**

##### ***The resources of the enterprise***

Factor has positive coefficient and statistically significant (at p-value = 5%) and the sign of the parameter estimates is the sign (+) as original expectations, reflecting the way the relationship between the probability of achieving efficiency of service delivery and resources to provide services of the business. Enterprises with equipment operation stability will improve efficiency services that provide businesses (Yizhi *et al.*, 2002). In the freight forwarding operations, transportation equipment is necessary to transport and delivery to customers. Means of transport are more available and more stable operation that will improve the quality of service.

##### ***Quality of the staff***

Factor has positive coefficient and statistically significant (at p-value = 5%) and the sign of the parameter estimates is the sign (+) as original expectations, reflecting the way the relationship between the probability of achieving efficiency and quality of the staffs. When the staffs have all skills that will increase efficiency service providers (Kuo *et al.*, 2012).

##### ***Outcomes***

Factor has positive coefficient and statistically significant (at p-value = 5%) and the sign of the parameter estimates is the sign (+) as original expectations, reflecting the way the relationship between the probability of achieving efficiency and outcomes. The business services, therefore, provider to meet the core requirements, enterprises have provided an efficient service to customers (Parasuraman *et al.*, 1988).

##### ***The relationship between enterprises and customers***

Factor has positive coefficient and statistically significant (at p-value = 5%) and the sign of the parameter estimates is the sign (+) as original expectations, reflecting the way the relationship between the probability of achieving efficiency and the relationship between enterprises and customers. When customers get value shared interest through policies outside of business profits, customer satisfaction for the services they use the higher, resulting assessment the efficient use of services as satisfactory. Based on modern marketing, the customer is the center of administration rather than businesses. In the fiercely competitive environment of the industry, the incentive program to meet the increasing requirements of customers will be an important strategy to retain customers (Kuo *et al.*, 2012).

##### ***The price of services***

Factor is no statistically significant (at p-value = 5%), does not affect the probability of achieving efficiency that businesses provide delivery. This states that customers do not concerned about the price of the services they utilize so much. Service delivery is diversity, dependent on customer requirements so that enterprises cannot offer a fixed price for each service. Therefore, the evaluation of the effectiveness of the delivery service provider of the enterprise- based price of service is incorrect. Additionally, the cost of logistics services, in general, is relatively low compared to the region, however, the level of service provided to uncertainty and less effective. In fact, the freight forwarding industry is developing at high speed, with the fierce competition, as evidenced by the mass entry of companies active in the field of logistics.

#### **5. CONCLUSIONS**

All in all, there are four core factors effect positively on the efficiency of freight forwarding service of freight forwarding enterprises, especially the firms in Vietnam, in which factors most strongly positively impact to the performance results. The difference of the research is the price factor affecting service capabilities provide efficient services business, it is also a matter of concern for the freight forwarding business while paying strategic importance to compete on price. However, this study has the objective to reflect on the effectiveness of corporate services forwarding Vietnam offers. Hopefully, there will be more

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researches, especially factors are not addressed in this study. Hopefully, this study will contribute a small part to improve efficiency provides freight forwarding services that the Vietnam freight forwarding enterprises supply.

## REFERENCES

- Banomyong, R., Thai, V. V., & Yuen, K. F. (2015). Assessing the national logistics system of Vietnam. *The Asian Journal of Shipping and Logistics*, 31(1), 21-58.
- Venkatraman, N., 1994. IT-enabled business transformation: from automation to business scope redefinition. *Sloan Management Review* 35 (2): 73.
- Vaidyanathan, G., 2005. A Framework for Evaluating Third-Party Logistics. *Communications of the ACM*. 48 (1): 89–94.
- Sauvage T., 2003. The Relationship Between Technology and Logistics Third-Party Providers. *International Journal of Physical Distribution & Logistics Management*. 33 (3): 236–253.
- Bi, R. *et al.*, 2013. Developing Organizational Agility Through IT and Supply Chain Capability. *Journal of Global Information Management*. 21 (4): 38–55.
- Paul R. Murphy & James M. Daley, 2000. An empirical study of internet issues among international freight forwarders. *Transportation Journal*. 39(4):5-13
- Kuo-Chung Shang & Chin-Shan Lu., 2012. Customer relationship management and firm performance: An empirical study of freight forwarder services. *Journal of Marine Science and Technology*. 23(2): 2.
- Yizhi Lu & John Dinwoodie.,2002. Comparative perspective of international freight forwarder services in China. *Transportation Journal*. 42 (2):17-27
- Griesinger, D. W., 1990. The human side of the economic organization. *Academy of Management Review*, 15(3), 478-499.
- Wahab, N. A., & Rahim Abdul Rahman, A. (2011). A framework to analyse the efficiency and governance of zakat institutions. *Journal of Islamic Accounting and Business Research*, 2(1), 43-62.
- Zou, S., & Stan, S. (1998). The determinants of export performance: a review of the empirical literature between 1987 and 1997. *International Marketing Review*, 15(5), 333-356.
- Katsikeas, C. S., Deng, S. L., & Wortzel, L. H. (1997). Perceived export success factors of small and medium-sized Canadian firms. *Journal of international marketing*, 53-72
- Scott W. Kelly 1989. Efficiency in service delivery: Technological or humanistic approaches. *Journal of Services Marketing*. 3: 43 – 50.
- Thai, V. V. (2008). Service quality in maritime transport: conceptual model and empirical evidence. *Asia Pacific Journal of Marketing and Logistics*, 20(4), 493-518.
- Becker, G. (1964). *Human capital*, NY. Columbia
- Williamson, O. E. (1975). *Markets and hierarchies*. New York, 2630.
- Tomer, J. F. (1987). *Organizational capital: The path to higher productivity and well-being*. Praeger publishers.
- Parasuraman, A., V.A. Zeithaml & L.L. Berry 1988. Servqual: A Multiple-Item Scale For Measuring Consumer Perception of Service Quality. *Journal of Retailing*. 64(1):12-40.
- Banomyong, R. & N. Supatn., 2011. Selecting Logistics Providers in Thailand: A Shippers' Perspective. *European Journal of Marketing*. 45(3): 419-437.
- Cronin Jr, J. J., & Taylor, S. A. (1992). Measuring service quality: a reexamination and extension. *The journal of marketing*, 55-68.
- Brady, M. K., & Cronin Jr, J. J. (2001). Some new thoughts on conceptualizing perceived service quality: a hierarchical approach. *Journal of marketing*, 65(3), 34-49.
- Holdford, D., & Reinders, T. P. (2001). Development of an instrument to assess student perceptions of the quality of pharmaceutical education. *American Journal of Pharmaceutical Education*, 65(2), 125-131.
- Ware Jr, J. E., & Davis, A. R. (1983). Behavioral consequences of consumer dissatisfaction with medical care. *Evaluation and program planning*. 6(3-4), 291-297.
- Lewis, B. R., & Mitchell, V. W. (1990). Defining and measuring the quality of customer service. *Marketing intelligence & planning*, 8(6), 11-17.
- Homburg, C. & Stock, R., 2005. Exploring the Conditions under which salesperson work satisfaction can lead to customer satisfaction. *Psychology of Marketing*. 22(5): 393 – 420.

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---

- Thai, V. V. (2007). Impacts of security improvements on service quality in maritime transport: An empirical study of Vietnam. *Maritime Economics & Logistics*, 9(4), 335-356.
- Zeithaml, V.A., 1988. Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *Journal of Marketing*. 52 (3): 2-22.
- Zeithaml, V. A., Parasuraman, A., & Berry, L. L. (1985). Problems and strategies in services marketing. *The Journal of Marketing*, 33-46.
- Bienstock, C.C., J.T. Mentzer & M.M. Bird., 1997. Measuring physical distribution service quality. *Journal of the Academy of Marketing Science*. 25(1):31-44.
- Wilding, R., & Juriado, R. (2004). Customer perceptions on logistics outsourcing in the European consumer goods industry. *International Journal of Physical Distribution & Logistics Management*, 34(8), 628-644.
- Snehota, I., & Hakansson, H. (Eds.). (1995). *Developing relationships in business networks*. London: Routledge.
- Reichheld, F. F., & Sasser, J. W. (1990). Zero defections: Quality comes to services. *Harvard business review*, 68(5), 105-111
- Anderson, J. C. (1995). Relationships in business markets: exchange episodes, value creation, and their empirical assessment. *Journal of the Academy of Marketing Science*, 23(4), 346-350.
- Bollen, K. A. (1989). A new incremental fit index for general structural equation models. *Sociological Methods & Research*, 17(3), 303-316.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*. 1998. Upper Saddle River.
- Hair, J. F., Celsi, M., Ortinau, D. J., & Bush, R. P. (2008). *Essentials of marketing research*. New York, NY: McGraw-Hill/Higher Education.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory (McGraw-Hill Series in Psychology) (Vol. 3)*. New York: McGraw-Hill.
- Meyers, L. S., Gamst, G., & Guarino, A. J. (2000). *Applied multivariate research: Design and interpretation*. Sage publications.
- Marta A.K. & Herbert K., 2006. Collaborating freight forwarding enterprises. *OR Spectrum*. 28(3): 301-307.
- Chablo, E. (2000). The importance of marketing data intelligence in delivering successful CRM. In *Customer Relationship Management* (pp. 57-70)

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**SOCIAL MEDIA MARKETING: CREATIVE STRATEGIES, CONTENTS AND CUSTOMER ENGAGEMENT  
IN VIETNAM**

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**Abstract**

This research paper aims to explore social media content strategies and the impact on customer engagement. By means of content analysis, this study reveals which social media channels are being used by top brands in Viet Nam, which types of creative strategies/ appeals are being adopted, and how these brands and appeals correlate to improve consumer engagement with these brands. The list of brands mentioned in this paper are top-ranked brands in Vietnam. A sample of social media posts from top brands are collected, analyzed and categorized. The results indicate that social networks, video sharing and blogs are tops of effective channel usage. It has also been found out that functional appeals, resonance and emotional appeals are excessively used. Furthermore, it has been revealed that social cause and image messages contribute huge association with customer engagement. The findings from this paper contribute to the knowledge of social media usage by brands and suggest implications for brand marketers in developing their own social media channels.

**Keywords:** *content analysis; creative strategies; customer engagement; message content; social media channels; social media marketing.*

**1. INTRODUCTION**

Social media, as stated by Murdough (2009), consists of various online platforms used to share and interact in number of activities, represents the critically important guideline for brands to communicate with potential audience segments. Furthermore, 2013 Social Media Industry Report (Stelzner, 2013) has stated that “86% of marketers believe that social media channels are important components of their marketing initiatives”. The use of social media not only supports the continuous synergy of Vietnamese but also useful for brands to approach their attractive customers. Ongoing interaction is maintained and encouraged through additional touchpoints of branded social campaign, which can “deepen consumer-brand relationships, helps marketers uncover common themes in consumer feedback, and persuade consumers to engage with online content” (Murdough, 2009).

Social media, although effective to implement, requires research upfront to identify which approaches and content makes sense for industry, organization, and line of business (Andzulis *et al.*, 2012). Furthermore, besides interactive aspect, social media has an interpersonal aspect, depending on consumer engagement. (Mangold and Faulds, 2009). The more positive self-images are constructed, the higher chance that consumers choose the brands. Ashley and Tuten investigated Creative strategies in Social media marketing and applying Klout score and Engagement score to measure the Consumer Engagement. In this paper, the sample is more specific by using top sample of brands in Vietnam and inspection whether the conclusion of the past research is applicable for case of Vietnam brands has been made.

To address the gap, an exploratory study of the usage of social media platforms, the usage of creative message strategies and the effectiveness of those to consumer engagement was conducted. A sample of top brands in intangible assets was collected to answer the following questions:

- Which social media platforms are being used by top brands that have been recognized for the social media efforts?
- Which types of creative message appeals are applied by top brands?
- How do the channels and message appeals correlate to customer engagement?

This exploratory research’ s purpose is to answer each of these questions. Finally, the paper concludes with directions for future research.

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## 2. LITERATURE REVIEW

### *Social media in marketing*

Social media, which is, according to Safko and Brake (2009) is defined as activities, practices, and behaviors among communities of people who gather online to share information, knowledge, and opinions using conversational media. The exposure of a phenomenon called social media creates a shift in marketing away from traditional methods toward the use of social media platforms. The 21st century is witnessing the burgeoning exchange of the Internet-based messages through these channels. In an MIT Sloan Management Review 2010, Hoffman and Fodor also emphasized that in the social media environment, marketers have unique opportunities to develop social media programs that tackle awareness, engagement and WOM objective.

### *Creative strategies and one of social media rois: Customer engagement*

Although social media is excellent tools for increasing customer engagement, it is a double-sided blade as in involving interpersonal aspects. This popularity may turn out to be advantage or disaster for brands depending on how the customer engages with the campaign (Mangold and Faulds, 2009). Marketing content, especially social media marketing content, and customer engagement influence each other, rather being a one-sided relationship in which content results in engagement. Brand engagement is one key factor leads to brand choice and brand commitment, which consequently converts into consumption (Burke and Reitzes, 1991). Hence, the implementation of creative strategies is essential to the level of engagement in marketing campaign.

In recent papers, social media has been classified into various types. Hoffman & Fodor has listed the appropriate social metrics according to social media application and social media performance objectives. These relevant metrics has been proven useful in the past to measure the ROI of Social Media Marketing. Based on the past research of Hooffman and Fodor, the metrics is calculated in this research depends on following applications: blogs, microblogging (e.g. Twitter), social bookmarking (e.g. StumbleUpon), forums and discussion boards (e.g. Google Groups), product reviews (e.g. Amazon), social networks (e.g. Bebo, Facebook, LinkedIn), video and photo sharing (e.g. Flickr, YouTube).

### *Creative strategies with message content*

In the race of digitalization, marketing on social media requires the existence of a marketing content. Social media marketers have created new concepts of creative strategies in the world of marketing with various types of message (Hoffman and Fodor, 2010). To increase effectiveness of the message being delivered, specifically, to erase the difference between what brands want to communicate and what consumers need to hear, creative strategies are formulated and applied (Ashley *et al.*, 2015).

In definition, message content is the content of the advertising message, which composed of information of products or ideas to increase brand exposure and image. Creative strategies, particularly message strategies involve several types of sub-categories distinguished by its content and how it communicates with receivers. According to Ashley and Tuten (2015), based on the approach of message delivery, the strategies can be categorized into integrated content, functional appeal, emotional appeal, experiential appeal, social cause, resonance, comparative. Furthermore, interactivity strategy allows consumers to take part in the campaign or animation strategy uses motion pictures to convey the message. Exclusivity and spokesperson are also strategies to communicate advertising message content. The message strategies which is used in this research paper has been proved useful and associate with customer engagement, including: functional appeal, emotional appeal, experiential appeal, unique selling proposition, comparative, resonance, user image, social cause, exclusivity, animation, spokecharacter, spokesperson (Ashley *et al.*, 2015).

## 3. METHODOLOGY

Content analysis has been employed to achieve the research purpose. In the past, this method has been proven useful in the messages of television advertising (Callcott and Lee, 1994), content in advergame (Dahl *et al.*, 2009) content of magazine advertisements (McQuarrie and Phillips, 2008), services advertisements (Turley and Kelley, 1997).

### *Sample of the brands*

To examine the social media content and find out creative strategies, this research has picked the top 10 brands. The comes from the most valuable brands based on Royalty Relief Approach identified in The Brand Finance – Top 50 Vietnamese Brands 2017.

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#### Sample of the channels

The social media platforms which each brand uses are numerous and random. To have overall perspective, top five of the most effective social media channels in Vietnam from April 2018 to April 2019 has been elected from gs.statcounter.com (Statcounter). These top five social media platforms are useful for us to concentrate on the creative strategies of the brands.

## 4. RESULTS

In this section of the study, the data in Table 1 reveals that there are significant differences in the social network channel usage. During the process of data collection, one point should be noted is that most Vietnamese brands use mostly social networking sites (Facebook and Instagram), video sharing sites (Youtube) and microblogging (Twitter) as channel to reach their customers. It is recognized that almost all brands have a Facebook fan page with frequent activities to introduce their marketing campaigns. Along with the excessive use of Facebook is the use of video sharing site with plentiful time range videos and content. Surprisingly, the same social networking site but holds the least usage by brands is Instagram.

**Table 1:** Correlation between social media channels, message content and customer engagement

Channel	Number of Brands (Out of 10)	Percentage of 10 brands	Total followers, total subscribers	Number of posts per day
<b>Social networking (Facebook)</b>	10/10	100%	5,969,136	1.635
<b>Video sharing (Youtube)</b>	7/10	70%	184,991	1.3116
<b>Microblogging (Twitter)</b>	6/10	60%	7,954	1.928
<b>Social networking (Instagram)</b>	4/10	40%	156,587	2.055

According to the ranking in Table 2, functional message, resonance and emotional appeal are three most common message. The frequency of this strategy 249 times, accounting for 82%. Follow is resonance strategy with 147 posts. It is found out that Facebook has strong correlation with Functional Appeal and Resonance, while Instagram attaches with Emotional Appeal. Furthermore, it can be seen from Table 2 that Youtube and Twitter have tendency to concentrate on Functional Appeal.

**Table 2:** Creative message contents frequency on each channel

Strategies	Facebook	Youtube	Instagram	Twitter	Number of posts (out of total 304 posts)	Percentage of usage frequency
<b>Functional appeal</b>	102	82	24	41	249	82%
<b>Emotional appeal</b>	31	29	23	6	89	29%
<b>Experiential appeal</b>	50	23	4	1	78	25.6%
<b>Unique selling proposition</b>	25	13	1	0	39	13%
<b>Comparative</b>	39	15	1	0	55	18%
<b>Resonance</b>	109	19	19	0	147	48%
<b>User image</b>	34	2	6	0	42	14%
<b>Social cause</b>	13	2	1	0	16	5%
<b>Exclusivity</b>	37	1	0	7	45	15%
<b>Animation</b>	7	0	0	0	7	2.3%
<b>Spokecharacter, spokesperson</b>	24	22	9	0	55	18%

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As shown in Table 3, some outstanding numbers are spotted. In social network sites functional appeal, resonance and user image strategies successfully caught customers attention and lead them to do online activities to increase their engagement including typing comments and pressing reactions buttons. Besides three mentioned strategies, experiential appeals and comparative strategies also affect customer engagement with over 50,000 reactions and an average of over 30000 comments to brand's post. This is a far high number comparing to other creative strategy sections. The case of video sharing site- Youtube faces different scenarios. The highest customer engagement rate lies on emotional appeal, resonance, user image and social cause post contents. These types of content reach over 19000 reactions and nearly 1000 comments from customers. Twitter is the lowest effective channel in Vietnam due to the low post frequency and usage by brands. However, the highest views always belong to functional appeal contents in all social media channels.

**Table 3:** Correlation between social media channels, message content and customer engagement

<b>Social network</b>	<b>Social network (Facebook)</b>	<b>Social network (Instagram)</b>	<b>Photo &amp; Video sharing (Youtube)</b>	<b>Microblogging (Twitter)</b>
<b>Creative strategy</b>	Customer engagement	Customer engagement	Customer engagement	Customer engagement
<b>Integrated Content</b>	0	0	0	0
<b>Functional Appeal</b>	57,701,503 views 72,019 reactions 27,918 comments	8,811 views 0 reactions 171 comments	3,237,927 views 1798 reactions 424 comments	0 views 42 reactions 2 comments
<b>Emotional Appeal</b>	26,292,246 views 16,337 reactions 2,739 comments	47,861 views 0 reactions 981 comments	394,235 views 20,796 reactions 1346 comments	0 views 2 reactions 0 comments
<b>Experiential Appeal</b>	21,759,787 views 73,754 reactions 3,612 comments	1,725 views 0 reactions 23 comments	369,032 views 1437 reactions 346 comments	0
<b>Unique selling proposition</b>	2,404,508 views 42,509 reactions 1,765 comments	1,693 views 0 reactions 23 comments	369,022 views 155 reactions 25 comments	0
<b>Comparative</b>	12,330,468 views 65,660 reactions 3,195 comments	1,693 views 0 reactions 23 comments	366,169 views 129 reactions 20 comments	0
<b>Resonance</b>	9,989,491 views 64,050 reactions 30,327 comments	6,599 views 0 reactions 137 comments	1,034,720 views 19920 reactions 1085 comments	0
<b>User Image</b>	42,430 views 52,583 reactions 968 comments	1,811 views 0 reactions 25 comments	146 views 19,003 reactions 979 comments	0
<b>Social cause</b>	60,798 views 17,699 reactions 1,161 comments	1,693 views 0 reactions 23 comments	181 views 19,004 reactions 979 comments	0
<b>Exclusivity</b>	36,600 views 20,282 reactions 16,725 comments	60 views 0 reactions 2 comments	0 views 19,000 reactions 979 comments	0
<b>Animation</b>	60,798 views 2,985 reactions 483 comments	0	0	0
<b>Spokescharacter</b>	24,649,003 views 28,827 reactions 330 comments	3,104 views 0 reactions 23 comments	271,008 views 1,345 reactions 274 comments	0

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## 5. CONCLUSION

The paper has provided some general knowledge about how Vietnamese brands use with social media marketing. The findings reveal the commonly used social media channels by brands, the creative content is applied the most frequently and how these channels and contents affect customer engagement. The results show that the top social media are being used by Vietnam top brands are social network which is the most favoured by brands, video sharing and microblogging. The top creative content being used are: Functional Appeal, Resonance and Emotional Appeal. Furthermore, an analysis based on Ashley and Tuten's (2015) conclusion and metrics of Donna and Marek (2010) is conducted to give a starting point about the relation between creative content, channels and a social media ROI - customer engagement. It is concluded that content such as functional appeal, emotional appeal, social cause, resonance and user image are related to customer engagement as well as brand performance.

## REFERENCES

- Andzulis, J. "Mick", Panagopoulos, N. G., & Rapp, A. (2012). A review of social media and implications for the sales process. *Journal of Personal Selling & Sales Management*, 32(3), 305–316.
- Ashley, C., & Tuten, T. (2015). Creative strategies in social media marketing: An exploratory study of branded social content and consumer engagement. *Psychology & Marketing*, 32(1), 15–27.
- Burke, P. J., & Reitzes, D. C. (1991). An identity theory approach to commitment. *Social Psychology Quarterly*, 239–251.
- Callcott, M. F., & Lee, W.-N. (1994). A content analysis of animation and animated spokes-characters in television commercials. *Journal of Advertising*, 23(4), 1–12.
- Dahl, S., Eagle, L., & Báez, C. (2009). Analyzing advergames: active diversions or actually deception. An exploratory study of online advergaming content. *Young Consumers*, 10(1), 46–59.
- Hoffman, D. L., & Fodor, M. (2010). Can you measure the ROI of your social media marketing? *MIT Sloan Management Review*, 52(1), 41.
- Mangold, W. G., & Faulds, D.J. (2009). Social media: The new hybrid element of the promotion mix. *Business Horizons*, 52(4), 357–365.
- McQuarrie, E. F., & Phillips, B. J. (2008). It's not your magazine ad: Magnitude and direction of recent changes in advertising style. *Journal of Advertising*, 37(3), 95–106.
- Murdough, C. (2009). Social media measurement: It's not impossible. *Journal of Interactive Advertising*, 10(1), 94–99.
- Safko, L., & Brake, D. K. (2009). *The social media bible: tactics. Tools & for Business Success*, Hoboken, New Jersey.
- Stelzner, M. A. (2017). *Social Media Marketing Industry Report*. 2011. URL: <http://www.socialmediaexaminer.com/SocialMediaMarketingIndustryReport2012.pdf> [accessed 2013-06-06][WebCite Cache].
- Turley, L. W., & Kelley, S. W. (1997). A comparison of advertising content: Business to business versus consumer services. *Journal of Advertising*, 26(4), 39–48.
- Whiting, A., & Williams, D. (2013). Why people use social media: a uses and gratifications approach. *Qualitative Market Research: An International Journal*, 16(4), 362–369.

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**TEACHER TRAINING AND DEVELOPMENT IN THE UNITED STATES – REALITY IN VIETNAM**

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**Abstract**

This report attempts to offer fundamentals in teacher training and development in the United States. The report is structured around the following five components designed in the form of questionnaires: (1) Teacher education programs which involve entry requirements, training curriculum, and exit standards; (2) teacher certification requirements; (3) teacher recruitment requirements; (4) continuing education and support for beginning teachers; and (5) providers and governance of teacher education and certification. One of the most striking findings is that while entry requirements for teacher education are flexible, if not downplaying, across the states, the curriculum places a particular focus on the subject area content courses and, more importantly, on coursework in education and pedagogical skills, together with a long period of in-school student teaching, as prerequisites for graduation. Let alone such practice-based exit requirements, the quality of prospective teachers is checked upon by teacher licensure testing and further empowered by regular induction programs and professional development with an ultimate goal of meeting the eleven professional standards for teachers. With these, the report reveals systematic differences in the practices of teacher education programs, certification, and professional development, among other things, in the United States as compared with those in Vietnam. Thus, it may leave some room for consideration.

**Keywords:** *development; teacher; training; United States; Vietnam.*

**1. INTRODUCTION**

Over almost the past two decades, significant attention has been given to U.S. states' policies governing the supply and quality of teachers. Strong debate, together with legislative initiatives, has focused on the entry requirements and higher standards, the need for nationwide standards in licensure testing, the quality of teacher education programs, alternate routes into teaching, academic requirements, induction programs and hiring, etc. In one way or another, any one of these issues has been viewed as a root cause or possible solution to the inadequate teacher quality and consequent student performance. Thus far much effort has been made to bring about changes in the aforementioned issues, it is hard, however, to define a typical framework that involves similarities in teacher education in the United States since program specifics and requirements vary widely within the context of each state and academic institutions.

This report endeavors to provide fundamentals in teacher training and development in the United States. The report gears its priority to the analysis of five components that help address the relevant questions of concern about teacher preparation in U.S. higher education. These include teacher education programs, teacher certification, teacher recruitment requirements, continuing education and support for beginning teachers, and providers and governance of teacher education and certification.

**2. TEACHER EDUCATION**

**Entry requirement**

**For undergraduate level**

*What are the requirements for entry into undergraduate teacher education programs?*

There is wide variation across U.S. states and higher education institutions in entry standards for undergraduate education programs and in their enforcement. In some instances students may begin teacher education coursework upon enrolling at the undergraduate institution. In other cases, prospective education students must complete two years of general or liberal arts studies and then apply for admission into the teacher education program. Some institutions require a minimum college general point average (GPA) or high school record. In addition, prospective students have to pass computer-based basic academic tests, known as Praxis I, to measure academic skills in reading, writing and mathematics. These tests are designed to provide comprehensive assessments that measure the skills and content knowledge of candidates before entering teacher preparation programs. In fact, a recent survey found that a majority of states require an exam for entry (Educator Recruitment & Retention

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Task Force, 2015). A few states, apart from Praxis I tests, may require recommendations, interviews, and experience working with learners as requirements for entry. However, these requirements are not popular in states that fall far short of teachers.

***For graduate level***

*What are the requirements for entry graduate teacher education into programs?*

Graduate-level teacher education programs in the United States generally require at least a bachelor's degree in education. Organizations responsible for reviewing and approving teacher education curriculum belong to independent national organizations and state statutory committees. Other admission requirements may include state certification in elementary, middle level, or secondary education, evidence for active engagement in classroom teaching, letters of recommendations, and a minimum undergraduate grade point average (GPA) of 2.5, or 3.0, overall and 3.0 in the academic major. In case, candidates who did not earn an adequate GPA in their major in undergraduate programs will be asked to complete additional courses in that major at host institutions.

***Teacher education curriculum***

*What courses or curriculum are required in teacher education programs? What is the balance between subject area content courses and courses in education and pedagogy? What are the differences between undergraduate and graduate programs? Who determines the requirements?*

In the United States, the curriculum content of teacher education programs is determined by individual teacher training institutions, within the context of state and national accreditation policies. There are similarities across institutions, however. In addition to subject area content courses, institutions typically require coursework on education theory and pedagogy, and student teaching experience. Courses in special education, health and nutrition, and computer science may also be required.

A typical undergraduate teacher education program might consist of 120 credit hours (the average required for graduation from most undergraduate liberal arts programs), or 134 credits (required to complete an undergraduate teacher education program). On average, 51 credits of general studies, 38 credits of major credits (includes courses in certification teaching subject area), 28 credits of professional studies (includes school, college, or department of education courses), and 14 clinical credit hours (includes student teaching and other field-based experiences) are required to complete initial preparation for school teaching. The curriculum is accredited by independent national organizations and state statutory committees.

Typical courses in a teacher preparation program are listed as follows: Advanced Processes and Acquisition of Reading; Best Practices in Teaching; Student Care Management & Admin; Classroom Management; Clinical Practice; Clinical Teaching; Cultural Perspectives in Education; Diagnosing and Correcting Reading Difficulties; Discipline and Classroom Management; Educating Exceptional Students; Educational Psychology; Foundations for Early Childhood Development; Human Growth and Development; Instructional Assessment; Instructional Technology; Integrated Literacy; Introduction to Teacher Certification; Pedagogy of Language Arts; Pedagogy of Math; Pedagogy of Reading; Pedagogy of Science; Pedagogy of Social Studies; Primary Education; Schooling in America; Supervised Demonstration Teaching; Elementary and middle school education or secondary education; Teaching Special Populations.

In addition to courses that relate to candidates' major and minor, coursework on education and pedagogical skills is required. The specific classes students need to take will depend on whether they are getting certified in elementary, middle, secondary, postsecondary, special education, or another area. Regardless of the type of certification, there are certain types of coursework that every prospective teacher needs to take:

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- Learner’s development or psychology: These courses will help future teachers better understand the minds of learners and how they develop;
- Curriculum and instructional design: These courses will help future teachers how to develop and write curricula and lesson plans for their classes;
- Methods: Teaching methods courses focus on the practice of teaching or pedagogy, including how to explain and demonstrate concepts, how to lecture, and how to hold an effective discussion;
- Assessment: In courses on assessment practices, prospective teachers will learn how to assess student learning by creating tests, using oral exams, designing projects, and other techniques;
- Special Education: Whether or not prospective teachers are pursuing special education certification, they will likely be required to take some coursework in this area. Even general education teachers must understand special education to some extent.
- For master’s students, they may be required to research and present a project, while at the same time taking courses that teach wide skill set, including: education philosophy; learning and cognition; psychology of teaching; critical thinking; instructional proficiency; curriculum theory and development.

***Student teaching experience***

*What kinds of classroom experiences are required? What is the nature and duration of these requirements?*

In the United States, all teacher programs include practical teaching experience as a final component in teacher education curriculum, often completed during the final year of study. The required duration of the student teaching experience varies by state as well as by the type of teaching license the candidate wishes to pursue. However, nearly all programs will require at least one semester (15 weeks) of student teaching and program specifics vary by state and institution. Some institutions may require a full year at one school (CAEP, 2013a).

There are two types of practical experiences for teacher candidates: field experiences and student teaching or other in-school practical experiences. Field experiences normally consist solely of observations and are required by most states prior to student teaching. Other prerequisites for student teaching may include the completion of specific subject area content courses and coursework, and an adequate GPA. A university faculty member and a classroom teacher, or the school principal, typically supervises a student teacher. Student teachers may first spend time in the school observing classes and assisting teachers. They are then paired with an experienced teacher, who likely is paid for assuming the supervisory role. Student teaching evaluation practices also vary by state, but are typically shared among several individuals, including a university faculty member, an experienced teacher, and sometimes the principal of the school.

***Exit Requirements***

*What requirements must be met to complete the teacher education program? Who determines these requirements?*

In the United States, exit standards for teacher education programs vary by state and institution, and are generally determined at the institutional level. By looking at the curriculum, exit standards typically are also required to include such things as an adequate GPA, completion of required subject area content courses and coursework, and student teaching. For master’s students, apart from these requirements, they may, depending on each state and respective institution, have to research and present a project and have an adequate GPA of the required coursework for mater’s program as discussed previously.

### **3. TEACHER CERTIFICATION**

***Initial certification***

*What are the requirements for the initial certification of teachers? Are tests used? Who sets the standards? For how long is the certificate valid?*

With all the exit standards already in place, candidates cannot enter the teaching profession at any level unless they get certified by their respective state through the passage of a teacher licensing examination, which is known as Initial Certification. Most states award a professional teaching certificate after completion of an approved program of required courses, student teaching experiences, criminal background checks, and successful passage of the state teacher licensing examination. States set their own cut scores on these examinations. The teacher licensing exam used by most states is the Praxis Series—the Professional Assessments for Beginning Teachers developed by the Educational Testing Service. In most states, the Praxis Series for initial certification consists of two parts to measure comprehensive assessment of teaching candidates’ standards: an academic skills

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assessment (Praxis I), known as the General Knowledge Tests, which measure knowledge and skills in essay writing, the English language, reading, and mathematics; an assessment of content knowledge (Praxis II), known as the Subject Area Test, specific to the content area(s) in which the candidate desires to teach (Masters, 2012). In some states, prospective teachers may also be required to take the Professional Education Exam (Praxis III), which measures pedagogical knowledge such as lesson planning and the selection of appropriate evaluation instruments.

Once all exams have been successfully passed and all other requirements as mentioned above have been met, the candidate can qualify for the Initial Certificate, typically valid for two years. In some states, the professional certificate is not renewable. After expiration, teachers must apply for a standard or regular certificate and face additional requirements—usually some type of performance-based assessment and a specified number of classroom teaching hours.

***Advanced certification***

*Is certification beyond the initial level available? Is it required or voluntary? How is it obtained? What incentives are offered for teachers who pursue advanced certificates?*

Advanced certification in the United States is voluntary, offered by the National Board for Professional Teaching Standards (NBPTS), a voluntary professional certification board. Key components include candidate's assembly of a portfolio and participation in on-demand tasks at assessment centers. Some states also offer a master teacher certificate, a voluntary certification issued to teachers demonstrating advanced competency and achievement. In some jurisdictions, NBPTS certification may be a prerequisite for a master teacher certification. This type of advanced certificate is usually held in conjunction with a professional license and often extends the validity of the professional license. Master teachers often provide mentoring to other teachers and play roles in curriculum development and other leadership activities.

Incentives for achieving advanced certification vary by state, but usually include salary increases or bonuses and promotions.

***Alternative certification***

*Are there ways for individuals to become teachers outside of traditional teacher education programs? How do these operate?*

In response to critical teacher shortages in the United States, often in low-income school districts and in certain fields, all states and the District of Columbia offer alternative teacher certification programs. According to a 2012 survey by the National Center for Education Statistics (NCES), 14.6% of teachers leading classrooms in public schools entered teaching through an alternative pathway (NCES, 2014). The alternative certification route typically provides on-the-job training to college graduates who are placed in teaching jobs and offered the necessary coursework, support, time, and supervision required for full certification. This training ranges from intensive summer programs to year-round programs that mirror regular teacher education programs. In many cases, eligible candidates can also complete the teacher preparation alternative certification online and receive interactive tutoring and support from experienced professionals in the field of education. Online preparation programs have grown more and more popular, with over 6,000 new educators graduating from online programs each year (USA Today, 2012). Most often, prospective teachers pursuing alternative certification have a bachelor's degree in a subject area (not in education), such as science, technology, engineering and mathematics (STEM), but have neither taken any education courses nor done any student teaching. Requirements for full licensure vary widely across states, depending on regional needs and local resources. However, most states require that alternative route candidates achieve a passing score on state examinations and take additional coursework (composed of student development or psychology, curriculum and instructional design, methods, assessment, and special education as mentioned previously) before a teaching credential is issued.

Alternative teacher certification programs are growing in popularity. For example, in states such as Texas and California nearly one-third of their new teachers and in New Jersey over 40% of new teachers are prepared in alternative route programs (NCEI, 2009). According to the report of National Center for Alternative Certification (NCAC), in 2010, there were approximately 600 alternate route teacher preparation programs in 48 states and the District of Columbia, and over 500,000 teachers graduated from alternate route programs since 1980 (NCAC, 2010). This tendency presented the direct result of many states' growing demand to use them to increase their pool of teachers from under-represented cultural groups; meet the staffing needs of urban and high-poverty schools; and attract mid-career professionals to teaching by avoiding the lengthy and arguably cumbersome certification process. A number of such programs exist, such as Teach for America, Troops to Teachers, and Transition to Teaching.

***Teacher recruitment requirements***

*Who is responsible for recruiting teachers? What are the criteria?*

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In the United States, schools and school districts are responsible for recruiting and hiring teachers. The size of these schools and school districts ranges from very small to very large, resulting in great differences in hiring needs and hiring processes. The system for recruiting and hiring teachers is not universal and has been characterized as fragmented by policy bodies like the National Commission for Teaching and America's Future. The most common hiring criteria are completion of an appropriate university degree (also including an adequate GPA of subject area content courses and coursework as well as student teaching experience), subject matter specialization, professional certificate or equivalent, demonstration of communication skills, proper attitude, and interviews.

In most states, upon having been recruited, teachers earn the right, after an average probationary period of three years, to continue teaching in their school districts. It is very difficult to terminate a tenured teacher, and this action usually requires proof of misconduct (Wixom, 2016).

#### **4. CONTINUING EDUCATION AND SUPPORT**

##### ***Beginning teacher induction***

*Are there support programs for new teachers? How do they operate?*

In much of the United States, new teachers become oriented to their school when they first start teaching. These orientations tend to last, at the most, a few days on a periodical basis throughout the year. Many school districts also offer structured support programs for beginning or first year teachers. These systematic efforts to support beginning teachers are known as induction programs and may involve a mentor or experienced teacher working with the beginning teacher.

There is a wide variety in induction program policies and components, however. According to a recent policy report conducted by New Teacher Center (NTC), 27 states required some type of new teacher support with some dedicated funding for teacher induction programs and a majority of states have policies in place to structure or guide teacher-mentor selection. Twenty-three states require or encourage release time for mentor teachers to conduct classroom observations and provide support during the school day. Twelve states establish a minimum amount of weekly or annual mentor contact time for beginning teachers. Most induction programs address three key elements: (1) classroom observations of and by beginning teachers; (2) formative assessment of or feedback on teaching from mentors; and (3) participation in a professional learning community or beginning educator peer network. Though induction programs for new teachers are voluntary, twenty-four states require new teachers to complete or participate in an induction or mentoring program for professional teaching certification (NTC, 2016).

##### ***Professional development***

*Are there additional educational programs or opportunities for practicing teachers? Are they required or voluntary? Are there incentives for participation?*

In the United States, some states issue a life teaching credential, and all professional development after that is up to the employer and/or the certificated staff member. Other states issue a permanent credential that must be verified periodically by the employer to ensure that the teacher has met the school district's professional development requirements. Other states require verification of professional development for renewal of the certificate.

For decades, professional development programs in the United States largely have been organized by individual schools or districts and, typically, in the form of workshops scattered throughout the school year, on a wide variety of topics. In some districts and states, workshops might precede the school year, particularly when a major new program is being introduced. A recent NCES survey of teachers on their professional development activities discovered the following topics, such as curriculum and performance standards, with educational technology integration, subject-area study, new instructional methods, and student performance assessment being the next most popular topics. Other common professional development topics concerned addressing the needs of disabled or limited-English proficient students, encouraging community involvement, classroom management and student discipline, addressing the needs of students of diverse backgrounds, engaging experienced teachers in professional development activities concerning in- depth study of their subject area or classroom management, program improvement activities to a moderate or great extent, school administration support in applying what was learned to a moderate or great extent, additional training to a moderate or great extent, and teaching initiatives to use to a moderate or great extent etc (NCES, 2016).

##### ***Professional standards for teachers***

*How many professional standards for school teachers? What domains are involved? How is each standard categorized?*

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In the United States, with a view to ensuring the quality of school teachers, a rubrics system of professional standards for teachers is established, involving teacher preparation, district induction programs, professional development programs, and the school district teacher evaluation. This system aligns with 11 standards which are typically grouped into the following four domains: The Learner and Learning (Standards One, Two, and Three); Content Knowledge (Standards Four and Five); Instructional Practice (Standards Six, Seven, and Eight); and Professional Responsibility (Standards Nine, Ten, and Eleven). The elements of each standard are divided into three categories: Performances, Essential Knowledge, and Critical Dispositions (see Index for details).

## **5. PROVIDER AND GOVERNANCE OF TEACHER EDUCATION AND CERTIFICATION**

### ***Who is responsible for teacher education and certification? What aspects are regulated?***

Across the states in the United States, teacher education programs are provided by multidisciplinary institutions within which, typically, a college of education is an affiliate though are a small number of only-teacher education institutions. According to the Council for the Accreditation of Educator Preparation (CAEP), as of 2011, there had been 1,624 educator preparation providers (CAEP, 2013b). Most are four-year undergraduate programs, but some five-year programs exist that add a fifth year to a standard undergraduate liberal arts program. Colleges of education are accredited as well as governed by accreditation authorities for teacher education and certification. However, the United States has a decentralized system of teacher education and certification, in that each state is responsible for initial credentialing of its teachers. Some states refer to this initial credential process as certification. Certification requirements vary greatly across the states, depending on local needs and available resources. However, there are probably more commonalities than differences in state teacher education and certification systems. This is in part due to the fact that during 2013, the National Council for Accreditation of Teacher Education (NCATE) and the Teacher Education Accreditation Council (TEAC) became the new unified accrediting body for educator preparation, the Council for the Accreditation of Educator Preparation (CAEP) recognized by the U.S. Department of Education. As the accreditor for educator preparation providers, CAEP is accountable to the public, the states, policymakers, and professionals in the field of educator (CAEP, 2013b). These accreditation authorities specify frameworks such as standards for entry and exit, the required areas of study, professional skills to be addressed, and the minimum number of days of practicum. Successful completion of such a course then allows the graduate to be registered or licensed to enter the teaching profession. However, additional requirements for registration or licensure, including standardized tests, have been in place in the US for a considerable time (Mawdsley and Cumming, 2015).

## **6. TEACHER TRAINING IN VIETNAM**

### ***The state of the problem***

Pedagogy plays an important role in human resources training for the national education system. Over 70 years, pedagogical sector and pedagogical departments/institutions have strived and overcome difficulties and accomplished emulation of good teaching and learning, as well as fulfill important tasks assigned by the Party and State. Outstandingly, pedagogical institutions have provided a large amount of teachers and educational managerial staff for the nation. Basically, the staff meets requirements of raising public intellection, human resource training, talent mentoring and contributes into the victory of national construction and defense. However, under the requirement of education reform, pedagogical institutions/departments have still had several shortcomings and inadequacies as follows:

### ***There is separation between teaching professional knowledge and practice for students***

There are two knowledge areas in training contents of pedagogical institutions/departments, namely basic science and educational science. Two knowledge areas support mutually and orient to form profession for learners. However, many pedagogical institutions/departments have not taught students how to apply basic science knowledge in teaching at schools. Meanwhile, training in educational science has not associate with contents of subjects and activities which students must teach and engage in schools. Development of knowledge foundation of teaching profession and practice in order to form and develop of practical skill of teaching has not been concerned properly for a long time.

### ***Role of teaching methodology teachers has not been appreciated***

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It is perceived inadequately in pedagogical institutions/departments about roles of teaching methodology teachers and subjects. It is thought that teaching methodology is not a science sector and only practise several professional skills; that anybody with basic science level is able to teach methodology and that students who learn well will teach well, etc. Therefore, if a lecturer is evaluated as being limited in teaching and scientific research, she/he will be transferred to teaching methodology subject. If a head of teaching methodology's qualification is doctor, his/her major is not teaching methodology. That's why the image of teaching methodology lecturers in pedagogical institutions/departments is hidden. They themselves have feeling of smugness and inferiority complex.

***Fostering ideal and morality for students has not been focused***

In higher education institutions, and especially pedagogical institutions/departments, students do not study morality but they must aware properly moral values, most importantly professional morality. For teaching occupation, professional morality is more essential. Pedagogical students must be mentored with professional ideal, have a strong attachment with teaching; comply with education law, rules, regulations of education and training sector; have a sense of discipline and responsibility; keep their quality, prestige and honor; live in honest and sound manner and be a good example for students; love, respect and behave equally with students; help students to overcome challenges in their learning, etc. However, for many reasons, institutions have not paid attention to such issue. Some pedagogical students violates discipline within learning period; and some students do not realize their great honor and responsibility in their human teaching activity.

***Content of pedagogical training has not adapted requirements of school education***

The sentence "Pedagogical goes after school" has existed for a long time in our national education. It reflects backward of teacher training institutions with high schools. It is obvious that while high schools have conducted many changes in terms of programs, teaching methods, evaluation methods, etc., many pedagogical institutions have been "standstill" and focused on only "methodical" works for dozens of years without any change. Lively environment in high school has not been reflected into occupational training content of pedagogical schools. Therefore, outcomes of pedagogical students lack of many professional skill required in high schools.

***It is too slow to innovate training methods, test and evaluation methods for students' learning results***

Although pedagogical institutions/departments have paid attention to and invested in renewal of teaching methodology and test and evaluation methods but it has not been effective and has not gained a significant change. Application of active teaching methodologies in institutions/departments is still limited and formalism. The current teaching method in many pedagogical institutions mainly focuses on "teacher centered" approach, one-way transmission of knowledge; accordingly, students have become passive in receiving lessons. Pedagogical institutions/departments have not played their roles in forming typical example for schools regarding to teaching methodology and evaluation methods.

***Research on educational science has been inadequate***

Research on educational science in pedagogical institutions has not contributed to solving pedagogical institutions' issues, and formed rationale basis for planning strategies and polices of educational development of the Party and the State. For lecturers, scientific research tasks has not been appreciated properly and linked between postgraduate works with scientific research. Research products has not applied or still applied limitedly in its institutions only.

***Teacher fostering has not brought about real effectiveness***

Although teacher fostering has been concerned by Ministry of Education and Training and educational managerial level over the past years, it has not meet properly and soundly the actual demand of teachers at levels. Many subjects and content of teacher fostering has not derived from difficulties and challenges of teachers in teaching and educating pupils. In addition, method and form of teacher fostering and result evaluation has not proper with each subject, specific conditions of each locality, etc.

***Solutions of improving teacher training and mentoring effectiveness***

***Reforming teacher training and mentoring goals***

Teacher training and mentoring must meet requirements of learning outcomes, i.e. necessary competencies and qualifications which enables students to well-perform teaching tasks and their roles of educator, independent educational researcher and solve arising problems.

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Goals of teacher training and mentoring must focus on high adaptability with requirements of educational reform and development; change of roles of teachers in the modern society. It is said that goals of teacher training must be stable with core values of teaching profession and be “dynamic” in order to develop new contextual qualifications of teachers.

*Advantages of teacher training model in multi-sector universities*

Previously, teachers used to train in pedagogical institutions. However, due to development trend of higher education, most of specialized universities have changed into multi-sector ones, including pedagogical institutions.

In the world, 30 years ago, there was no pedagogical institution in Finland. Teachers have been trained in all universities. In case, a student who graduates with excellent grade for one major (corresponding to subject in high schools), wants to become a teacher, he/she will study pedagogical profession for 1-2 years. For grade 1-6, teachers must be master in education and for grade 7-12, teachers must be scientific master. Thanks to the model, Finland has gained a best teaching staff in the world which made a “PISA shock”.

In Vietnam, in the 1990s, it is stated that “Pedagogical institutions not only train teachers but also others; Teachers are not only trained in pedagogical institutions but also in others.” With the policy, many pedagogical institutions has transferred into multi-sector training; many institutions which were not pedagogical ones has joined in teacher training activity. The image of teacher training has been added with many new colors.

In fact, its 15 years of multi-sector training has clarified such doubts. Teacher training in multi-sectorial university does not remove its character but affirms its scientific basis and feasibility of teacher training model in multi-sectorial university.

With regards to advantages of training mode, pedagogical training majors may make use of strengths from non-pedagogical training majors, including creativeness, diversity of culture and technology, etc. in order to equip students with a foundation of stable technology, science and culture knowledge. Pedagogical lecturers are facilitated to exchange with other non-pedagogical majors, etc. In addition, teacher training in multi-sector universities also supports for non-pedagogical lecturers with theoretical and practical teaching methodology and techniques.

Therefore, it should not be inflexible with the conception that Teachers must be trained in pedagogical institutions and pedagogical institutions only train teachers. Among current higher education teacher training institutions, only two institutions, namely Hanoi National University of Education and Ho Chi Minh City University of Pedagogy are pedagogy-majored one. However, according to their mission and vision as well as practice, they are multi-major training ones. Other pedagogical institutions such as Thai Nguyen University of Education, Hue University of Education, University of Danang - University of Science and Education are multi-sectorial institutions in the region.

***Reforming teacher training and mentoring methods***

*Combining closely basic science training with educational science training*

There are two major knowledge areas in training contents, namely basic science (BS) and educational science (ES). Two knowledge areas support mutually and orient to form profession for learners. Therefore, BS and ES should be integrated into a consistent system. Professional training must ensures operational feature and operational training must base on professional training. Hence, it should mobilize teaching staff of BS to actively participate in pedagogical operation (PO) for students.

*Attaching PO training to reality in schools*

Based on school reality (psychophysical characters of pupils, textbooks, teaching and learning conditions, content and method of PO training for students are determined. At the same time, based on pedagogical features of teachers, requirements of qualification and competencies of teachers under professional standards are identified so that PO practice program will form such qualification and competencies for students. Specifically, it will form professional ideals, work passion, enthusiasm; basic and systematic training of pedagogical competencies for students; lecturers of PO subjects must be close to general schools. As a result, knowledge to be provided to students will be useful. Therefore, pedagogical institutions must have rigid regulation on tour trips to schools for lecturers of PO subjects and must encourage them to directly engaging in teaching some periods in schools.

*Developing a process of PO practice for students*

PO training not only provides students with educational science knowledge but also forms necessary pedagogical skills: pupil teaching and education; cooperating with educators, family and society; research educational science; self-study to improve their qualification, etc. Such skills are only developed in continuous PO practice through practical activity and probation.

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Therefore, a process of PO practice for students must be formulated; it must clearly identify specific works students must conduct from the first year to the final year. The practical process must be consistent with training content of each academic year and entire course.

*Creating favorable environment of PO practice for students*

Effectiveness of PO practice of students depends mainly on environment factors: “Perceived environment” in pedagogical institutions and “actual environment” in schools. In a perceived environment, students practice pedagogical skills with “assumed objects”. Practice result in such environment will have big impact on practice on actual environment. Therefore, it should facilitate students to practice pedagogical skills with inter-curriculum, extra-curriculum, group activities, social activities, etc. However, it must clarify importance of PO practice in an “actual environment:” which should not be limited in probations only. Students should practise in real environment soon. It requires constructing school of pedagogy practice under institutions and it should consider that investment in school of pedagogy practice is similar to investments in modern labs of experimental departments.

## 7. CONCLUSION

Ensuring the quality of teachers has been one of the focal points on the U.S. educational policy-making agenda. This great need did call into question the status of teacher education programs, certification, professional development, teacher compensation policy, and governing bodies of teacher education and certification. As a result, changes in the five aforementioned components have been made and contributed greatly to the improvement of teacher education and training, and, respectively, in-school student performance over the past decade, especially since President Obama’s Educational Reform Plan commencing in 2010. Of a particular note to such a development are a practice-based curriculum, higher exit standards, teacher- quality licensure testing and regular induction programs as well as professional development, which, taken together, align with the eleven professional standards for teachers.

Innovation in teacher training and mentoring is a necessary requirement. The reform must base on the orientations of teachers and managerial staff development stated in the Resolution 29- NQ/TW by the Communist Party of Viet Nam Central Committee (11th tenure). At the same time, it must result from change of teachers’ role in the modern society. In order to improve effectiveness of teacher training and mentoring reform, it must apply consistently all solutions mentioned above.

As part of the search for successful approaches to teacher education and training in the United States, it may be helpful for Vietnamese institutions of education to learn some extent from the U.S. teacher education models in place. This involves creative and energetic solutions that need to begin soon and be sustained for many years to come. Urgent steps to be taken lie in reconsideration of the existing training curriculum, duration of prospective teachers’ internship, exit requirements, certification, and teachers’ professional development in Vietnamese institutions of education.

## REFERENCES

- CAEP (2013a), Annual Report to the public, the states, policymakers, and the education profession. Washington, DC: Council for the Accreditation of Educator Preparation. Available at <[http://caepnet.files.wordpress.com/2013/05/annualreport\\_final.pdf](http://caepnet.files.wordpress.com/2013/05/annualreport_final.pdf)>.
- CAEP (2013b), Policy Manual. Washington, DC: Council for the Accreditation of Educator Preparation, CAEP Website. Available at <[http://caepnet.files.wordpress.com/2014/02/caep\\_policy\\_manual.pdf](http://caepnet.files.wordpress.com/2014/02/caep_policy_manual.pdf)>.
- Educator Recruitment & Retention Task Force, Education Retention and Recruitment Report, prepared by the Arizona Department of Education Educator Retention and Recruitment Task Force, January 2015. Available at <<http://www.azed.gov/wp-content/uploads/2015/02/err-initial-report-final.pdf>>.
- Masters G. (2012), Enhancing the Quality of Teaching and Learning in Australian Schools, Australian Council for Educational Research (ACER), Available at <[http://www.acer.edu.au/documents/Masters\\_submission\\_to\\_Senate\\_Inquiry.pdf](http://www.acer.edu.au/documents/Masters_submission_to_Senate_Inquiry.pdf)>.
- Mawdsley R. & Cumming J., Certification of Teachers, Pre-Service Teacher Education, Tests and Legal Issues in Australia and the United States of America (US): Part A, Context, and US History, International Journal of Law & Education, 16(1), 2011, 23-40.
- NCES, Statistics released at <[https://nces.ed.gov/surveys/sass/xls/sass1112\\_2014\\_01\\_t1n.xlsx](https://nces.ed.gov/surveys/sass/xls/sass1112_2014_01_t1n.xlsx)>.



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***E-Proceedings of 2<sup>nd</sup> Connect-Us Conference (CuC 2019)***  
*Digital Transformation – Opportunities and Challenges*

---

NCES, The Condition of Education, NCES Website. Available at <<https://nces.ed.gov/pubs2016/2016144.pdf>>.

NTC, Support From The Start: A 50-State Review of Policies on New Educator Induction and Mentoring, NTC Website. Available at <<https://newteachercenter.org/wp-content/uploads/2016CompleteReportStatePolicies.pdf>>.

Wixom, Micah Ann, Mitigating Teacher Shortages: Teacher Leadership, Education Commission of the States, 2016, pp. 1-8.  
Communist Party of Vietnam, Doctrine of 11th tenure National Assembly of Communist Party of Vietnam, The National Political Publishing House, Hanoi, 2011.

Communist Party of Vietnam, Resolution of 8th plenary meeting, Vietnam Central Committee, 11th tenure, Office of the Party Central Committee, Hanoi, 2013.

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**VIRTUAL RETAILING ENVIRONMENTS: PRESENCE, VALUE EXPERIENCE, AND DECISION-MAKING EVALUATION**

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**Abstract**

Virtual retailing environments have developed rapidly to apply advanced technologies which constitute an emerging alternative and promising shopping channel that offers consumers the sense of being present in a given virtual context. This research examines the effects of presence on value experiences which in turn influence the evaluation of the decision-making process. The moderating role of regulatory-focused orientation on the presence-value experience linkages is also investigated. With the dataset from 525 retailing-mobile-apps customers in Vietnam, the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach is applied to analyze and test the proposed hypotheses. The analysis results reveal that, three positive aspects of presence, namely spatial presence, involvement and realness, promote both hedonic and utilitarian value experiences while „negative effects“ aspect of the virtual presence status inhibits those values. Decision-making evaluation which is comprised of decision comfort and decision confidence is found to be determined by both hedonic and utilitarian values. Further, the findings indicate that relationships between three positive aspects of presence and two value experiences vary across prevention- and promotion-focused consumers. These findings provide valuable insights into the limited body of knowledge pertaining to the emerging consumer perceptions and evaluations in virtual retailing settings.

**Keywords:** *decision comfort; decision confidence; hedonic value; presence; utilitarian value; virtual retailing.*

**1. INTRODUCTION**

The global retail trade has been changed rapidly over the past few decades due to the development of e-commerce channels and digital applications (Verhoer *et al.*, 2015). Using “smart retailing” technology is one of the best ways to add value to businesses and customers (Dacko, 2017; Pantano and Timmermans, 2014). According to eMarketer (2018), total sales in Asia-Pacific grew 7.7% in 2017 to \$9.268 trillion and retail e-commerce sales increased by 31.1% (\$1.349 trillion) in 2017. M-commerce sales in Asia-Pacific accounted for 76.1% of retail e-commerce sales in 2017 to \$1.017 trillion and will outpace desktop in 2021 to account for 85% of online sales (eMarketer, 2018). Retailing mobile applications (retailing-mobile-apps) continue to emerge as the one of powerful, convenient, and ubiquitous service delivery channels that enable retailers to provide consumers with a wide range of products and services (Mc Lean *et al.*, 2018; Fang, 2017). Experiences within such virtual retailing environments can simulate real shopping (Kim *et al.*, 2015), which leads to interactivity and vividness of e-retailing. Online retailers have adopted VR, AR technologies as well as interactive retailing-mobile-apps with the intention to enhance consumers’ feeling of being presence in virtual environments (Hilken *et al.*, 2017; Huang and Liao, 2015).

Presence is a key enabler because it provides richer information about goods/services, which attracts consumers, encourages consumers to choose and purchase online without directly experiencing the goods/services as well as leads to customer engagement (Algharabat *et al.*, 2018; Kim *et al.*, 2013; Suh and Chang, 2006). The current research develops and tests a dynamic mechanism/framework in which four dimensions of presence in the retailing-mobile-apps, i.e. spatial presence, involvement, realness, and negative effects, are the driving forces to affect both hedonic and utilitarian value experiences, which in turn stimulate the decision-making evaluations (decision comfort and decision confidence). Moreover, the moderating effects of regulatory focus (prevention- and promotion-focused consumers) on the studied relationships in research framework are also examined.

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## 2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The presence theory (Li *et al.*, 2002; Song and Zinkhan, 2008) are frequently utilized to investigate the predicting factors that affect consumers' interactivity perceptions and sense of presence. The presence theory has been continuously applied to explain how a virtual medium's structure can influence consumers' attitudes and behaviors, which in turn motivate consumers to behave in various virtual environment settings, such as the early work of Li *et al.* (2002) in 3-D advertising experience, later the study of Song and Zinkhan (2008) about website effectiveness perceptions and behaviors; and attitudinal and behavioral intention toward hotel website in Lee's (2018) study. However, prior studies applying this theory is still fragmented and at an early stage of development (Cummings and Bailenson, 2015; Lombard *et al.*, 2017) and usually investigate in websites and 3-D advertising contexts (e.g. Lee, 2018; Li *et al.*, 2002; Song and Zinkhan, 2008), while the presence theory can be considered in another virtual environment settings. The current research, therefore, aims to contribute to the extant literature by extending the presence theory, which posits that sense of presence in the retailing-mobile-apps' structure predicts consumers' value experience. Moreover, the notion of decision-making evaluation has attracted several attentions of scholars recently (see for example Hilken *et al.*, 2017; Parker *et al.*, 2016). Within the context of virtual retailing environments in general and the retailing-mobile- apps in particular, how to increase consumers' feeling of being contended or with an ease in decision evaluations plays a significant role (Dacko, 2016; Hilken *et al.*, 2017). However, the comprehensive review indicates research on consumers' decision-making evaluation (decision comfort and decision confidence) in virtual retailing environment is still less understood and requires a deeper investigation. Moreover, only a few studies have explored the link between presence and consumers' decision evaluations for online websites (e.g. Hilken *et al.*, 2017) and to the best of the authors' knowledge, there are not many studies that have investigated the impact of sense of presence on consumers' decision-making evaluation through the mediating mechanism of experiential value perceptions of retailing-mobile-apps. Therefore, the relationships between sense of presence, experiential value, and consumers' decision-making evaluation are introduced and examined in this study. The complete hypotheses statements are proposed as below:

- H1: In the retailer's app experience, spatial presence has a positive interaction effect on a) consumer's utilitarian value and b) consumer's hedonic value perceptions
- H2: In the retailer's app experience, involvement has a positive interaction effect on a) consumer's utilitarian value and b) consumer's hedonic value perceptions
- H3: In the retailer's app experience, realness has a positive interaction effect on a) consumer's utilitarian value and b) consumer's hedonic value perceptions
- H4: In the retailer's app experience, negative effects have a negative interaction effect on a) consumer's utilitarian value and b) consumer's hedonic value perceptions
- H5: Consumer's utilitarian value perceptions of the retailer's app experience positively predict a) decision comfort and b) decision confident
- H6: Consumer's hedonic value perceptions of the retailer's app experience positively predict a) decision comfort and b) decision confident
- H7: Consumer's utilitarian value perceptions mediate the effects of a) spatial presence, b) involvement, and c) realness on x) decision comfort and y) decision confident
- H8: Consumer's hedonic value perceptions mediate the effects of a) spatial presence, b) involvement, and c) realness on x) decision comfort and y) decision confident
- H9: The sense of presence antecedents: a) spatial presence, b) involvement, and c) realness will have a stronger positive interaction effect on consumer's utilitarian value perception for prevention-oriented individuals than for individuals who are promotion-oriented.
- H10: The sense of presence antecedents: a) spatial presence, b) involvement, and c) realness will have a stronger positive interaction effect on consumer's hedonic value perception for promotion-oriented individuals than for individuals who are prevention-oriented.

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### 3. RESEARCH METHODOLOGY

The research framework includes eight constructs and three control variables. All the construct measurements were adapted from the validated scales of the previous studies, with slight modification to fit the current research settings. A seven-point Likert scale was employed. Three components of presence, namely spatial presence, involvement, and realness, was measured by the well-established respective six-, four-, and four-item indexes adapted from Schubert *et al.* (2001). Another antecedent, negative effects, was assessed by the four-item scale borrowed from Lessiter *et al.* (2001). Dual experiential values, utilitarian and hedonic value, were comprised of four- and four- item scales derived from the Hilken *et al.*'s (2017) research. Regard to the measurement for the final outcome variables, there were five items to measure decision comfort, while the decision confident scale had also five statements, which were slightly modified from Parker *et al.* (2016). The moderators, prevention focus and promotion focus, were measured by using the respective five- and five-item indexes of Thongpapanl *et al.* (2018). Privacy concerns describes the customers' concerns about their awareness of privacy practices used by the retailers, i.e., how a retailer collects and uses personal information (Hilken *et al.*, 2017) and was measured by the three-item scale adapted from Malhotra *et al.* (2004); both experience usage and age were one-item scales. 560 questionnaires were distributed, and 551 were received. 26 of them were uncompleted or included invalid answers and so, were eliminated during data cleaning process. Eventually, 525 were qualified and valid for data analysis.

### 4. RESULTS AND DISCUSSION

The Partial Least Squares (PLS) technique, in particular the software package of SmartPLS 3.0 (Ringle *et al.*, 2015), was employed as the main statistic tool for data analysis. The following reports the results of scale accuracy, common method bias (CMB), research model quality (R2, Q2, and SRMR), main direct effects, mediating effects, and moderating effects testing. The results of reliability test shown that all constructs was of good reliability because composite reliability (CR) values and average variance extracted (AVE) indexes were all above the thresholds of 0.70, 0.70, and 0.50, respectively. The result of convergent validity test indicated a satisfactory level for all measurement scales because the factor loadings of all scale items on their corresponding constructs exceeded the threshold value of 0.5. Discriminant validity was evaluated by three criteria, including the AVE values, Heterotrait-Monotrait (HTMT) ratios, and factor structure. The analysis results showed good discriminant validity for all constructs as well.

The analytic results of the structural model indicated that, the R2 and Q2 values were all greater than the respective recommended levels of 0.1 and zero (Henseler *et al.*, 2009). The SRMR value exhibited less than a cut-off value of 0.08 (Henseler *et al.*, 2015). These results implied a satisfactory and substantive model of the current research. A t-test calculated from the bootstrapping procedure of 5000 samples was applied to examine the hypothesized effects, while Cohen's Indicator (f2) was used to measure the effect sizes of the studied relationships. The t-test results revealed that all the hypotheses coefficients were supported and the f2 values pointed out that the strength of the studied relationships were from medium to large effect sizes (Cohen, 1988; Henseler *et al.*, 2009).

### 5. CONCLUSION

In summary, the analysis results confirm the relationships from four components of the sense of presence (i.e. spatial presence, involvement, realness, negative effects) to consumers' experiential values in virtual retailing environment, and then to their decision-making evaluation. All measurement scales meet the requirement, and all the hypotheses coefficients are supported. Such research findings significantly contribute to the growing knowledge pertaining to sense of presence in virtual retailing environments and tendencies of online retailing engagement, and as such, providing valuable implications for mobile commerce business. However, since the data is collected in Vietnam, the findings may not be applicable to a more developed country, which paves the way for additional validation of the current research framework in the future.

### REFERENCES

Algharabat, R., Rana, N. P., Dwivedi, Y. K., Alalwan, A. A., & Qasem, Z., "The effect of telepresence, social presence and involvement on consumer brand engagement: An empirical study of non-profit organizations", *Journal of Retailing and*

---

***E-Proceedings of 2<sup>nd</sup> Connect-Us Conference (CuC 2019)***  
*Digital Transformation – Opportunities and Challenges*

---

- Consumer Services, Vol.40, (2018), pp.139-149, available online: <https://www.sciencedirect.com/science/article/pii/S0969698917304319>, last visit: 29.06.2019
- Cohen, J. (1988), *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed., Lawrence Erlbaum Associates, New York, NY, USA.
- Dacko, S. G., “Enabling smart retail settings via mobile augmented reality shopping apps”, *Technological Forecasting and Social Change*, Vol.124, (2017), pp.243-256, available online: <https://www.sciencedirect.com/science/article/pii/S0040162516304243>, last visit: 29.06.2019
- eMarketer, “Asia-Pacific retail and ecommerce sales: eMarketer’s updated estimates for 2017–2021”, (2018), available online: <https://www.emarketer.com/Report/Asia-Pacific-Retail-Ecommerce-Sales-eMarketers-Updated-Estimates-20172021/2002183>, last visit: 29.06.2019
- Fang, Y. H., “Exploring task-service fit and usefulness on branded applications continuance”, *Journal of Services Marketing*, Vol.31, No.6, (2017), pp.574-588, available online: <https://www.emeraldinsight.com/doi/abs/10.1108/JSM-07-2016-0256>, last visit: 29.06.2019
- Henseler, J., Ringle, C. M., & Sinkovics, R. R., “The use of partial least squares path modeling in international marketing”, in Sinkovics, R. and Ghauri, P. (Ed.) *New Challenges to International Marketing: Advances in International Marketing*, Vol.20, Emerald, Bingley, UK, pp.277-319.
- Henseler, J., Ringle, C. and Sarstedt, M., “A new criterion for assessing discriminant validity in variance-based structural equation modeling”, *Journal of the Academy of Marketing Science*, Vol.43 No.1, (2015), pp.115- 35, available online: <https://link.springer.com/article/10.1007/s11747-014-0403-8>, last visit: 29.06.2019
- Hilken, T., de Ruyter, K., Chylinski, M., Mahr, D., & Keeling, D. I., “Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences”, *Journal of the Academy of Marketing Science*, Vol.45, No.6, (2017), pp.884-905, available online: <https://link.springer.com/article/10.1007/s11747-017-0541-x>, last visit: 29.06.2019
- Huang, T. L., & Liao, S., “A model of acceptance of augmented-reality interactive technology: the moderating role of cognitive innovativeness”, *Electronic Commerce Research*, Vol.15, No.2, (2015), pp.269-295, available online: <https://link.springer.com/article/10.1007/s10660-014-9163-2>, last visit: 29.06.2019
- Kim, E., Lin, J. S., & Sung, Y., “To app or not to app: Engaging consumers via branded mobile apps”, *Journal of Interactive Advertising*, Vol.13, No.1, (2013), pp.53-65, available online: <https://www.tandfonline.com/doi/abs/10.1080/15252019.2013.782780>, last visit: 29.06.2019
- Kim, S. J., Wang, R. J. H., & Malthouse, E. C., “The effects of adopting and using a brand’s mobile application on customers’ subsequent purchase behavior”, *Journal of Interactive Marketing*, 31, (2015), pp.28-41, available online: <https://www.sciencedirect.com/science/article/pii/S109499681500033X>, last visit: 29.06.2019
- Lee, S., “Investigating antecedents and outcome of telepresence on a hotel’s website”, *International Journal of Contemporary Hospitality Management*, Vol.30, No.2, (2018), pp.757-775, available online: <https://www.emeraldinsight.com/doi/abs/10.1108/IJCHM-12-2015-0722>, last visit: 29.06.2019
- Lessiter, J., Freeman, J., Keogh, E., & Davidoff, J., “A cross-media presence questionnaire: The ITC-Sense of Presence Inventory”, *Presence: Teleoperators & Virtual Environments*, Vol.10, No.3, (2001), pp.282-297, available online: <https://www.mitpressjournals.org/doi/abs/10.1162/105474601300343612>, last visit: 29.06.2019
- Li, H., Daugherty, T., & Biocca, F., “Impact of 3-D advertising on product knowledge, brand attitude, and purchase intention: The mediating role of presence”, *Journal of Advertising*, Vol.31, No.3, (2002), pp.43-57, available online: <https://www.tandfonline.com/doi/abs/10.1080/00913367.2002.10673675>, last visit: 29.06.2019
- Malhotra, N. K., Kim, S. S., & Agarwal, J., “Internet users’ information privacy concerns (IUIPC): The construct, the scale, and a causal model”, *Information Systems Research*, Vol.15, No.4, (2004), pp.336-355, available online: <https://pubsonline.informs.org/doi/abs/10.1287/isre.1040.0032>, last visit: 29.06.2019
- McLean, G., Al-Nabhani, K., & Wilson, A., “Developing a mobile applications customer experience model (MACE)- Implications for retailers”, *Journal of Business Research*, 85, (2018), pp.325-336, available online: <https://www.sciencedirect.com/science/article/abs/pii/S0148296318300171>, last visit: 29.06.2019
- Parker, J. R., Lehmann, D. R., & Xie, Y., “Decision comfort”, *Journal of Consumer Research*, Vol.43, No.1, (2016), pp.113-133, available online: <https://academic.oup.com/jcr/article-abstract/43/1/113/2379662>, last visit: 29.06.2019
- Pantano, E., & Timmermans, H., “What is smart for retailing?”, *Procedia Environmental Sciences*, Vol.22, (2014), pp.101-107, available online: <https://www.sciencedirect.com/science/article/pii/S1878029614001571>, last visit: 29.06.2019

---

***E-Proceedings of 2<sup>nd</sup> Connect-Us Conference (CuC 2019)***  
*Digital Transformation – Opportunities and Challenges*

---

- Ringle, C. M., Wende, S., & Becker, J. M., “SmartPLS 3”, Boenningstedt: SmartPLS GmbH, (2015), [http://www. smartpls. com](http://www.smartpls.com).
- Schubert, T., Friedmann, F., & Regenbrecht, H., “The experience of presence: Factor analytic insights”, *Presence: Teleoperators & Virtual Environments*, Vol.10, No.3, (2001), pp.266-281, available online: <https://www.mitpressjournals.org/doi/abs/10.1162/105474601300343603>, last visit: 29.06.2019
- Song, J. H., & Zinkhan, G. M., “Determinants of perceived web site interactivity”, *Journal of Marketing*, Vo.72, No.2, (2008), pp.99-113, available online: <https://journals.sagepub.com/doi/abs/10.1509/jmkg.72.2.99>, last visit: 29.06.2019
- Suh, K. S., & Chang, S., “User interfaces and consumer perceptions of online stores: The role of telepresence”, *Behaviour & Information Technology*, Vol.25, No.2, (2006), pp. 99-113, available online: <https://www.tandfonline.com/doi/abs/10.1080/01449290500330398>, last visit: 29.06.2019
- Thongpapanl, N., Ashraf, A. R., Lapa, L., & Venkatesh, V., “Differential effects of customers’ regulatory fit on trust, perceived value, and m-commerce use among developing and developed countries. *Journal of International Marketing*, Vol.26, No.3, (2018), pp.22-44, available online: <https://journals.sagepub.com/doi/abs/10.1509/jim.17.0129>, last visit: 29.06.2019
- Verhoef, P. C., Kannan, P. K., & Inman, J. J., “From multi-channel retailing to omni-channel retailing: introduction to the special issue on multi-channel retailing”, *Journal of Retailing*, Vol.91, No.2, (2015), pp.174-181, available online: <https://www.sciencedirect.com/science/article/pii/S0022435915000214>, last visit: 29.06.2019

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**FACTORS INFLUENCING THE DECISION OF APPLYING TO THE HIGH-TECH TRANSPORTATION COMPANIES: THE CASE OF HO CHI MINH CITY – VIETNAM**

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**Abstract**

In Vietnam, there are increasingly the online ride booking companies with well-designed marketing strategies. They allow users not only to book car/ bike online via mobile device applications but also to buy food, or to deliver goods to everywhere. This new industry has contributed to changing the face of the transportation industry of the country. Therefore, the battle is turning to fierce competition between the old suppliers such as Mai Linh, Vinasun and the new comers like Grab, Go-Viet, Be, Vato, Fast-Go (Younetmedia, 2018). The image of the company's partners moving on the streets with Grab's green, Go-Viet's red or Be's yellow uniforms becomes so familiar to Vietnamese. Each company has its own price policy, discount, bonus regimes and regulations for its partners. The partners of these transportation companies have also many different reasons to be a partner for a certain company. This conference paper just aims to discover, describe basically the factors influencing the decision of the riders in applying to a high-tech transportation company and their roughly assessment of policies and remuneration regimes. Two in-depth interviews and one focus group interview with stakeholders have been conducted first and followed after by a survey of two hundred and ten riders (non-probability). It is found that the most important factors affecting the applying decision as a rider are commission/ discount, reward/ bonus regime, and number of customers.

**Keywords:** taxi; transportation industry; high-tech transportation; online ride booking companies; Ho Chi Minh City.

**1. INTRODUCTION**

Today, Vietnam has totally nine online ride booking companies (Binh An, 2018). They not only allow Vietnamese consumers to book bikes/cars online via mobile application but also change their habits in moving, travelling, buying food and delivering goods within the city. In Hanoi and Ho Chi Minh Cities of Vietnam, the "battle" among these transportation-oriented providers is very fierce year by year. Some of them are GRAB with more than 100,000 riders (partners), GO-VIET with 35,000 partners, and BE with 10,000 partners (CI Research, 2018, Tue An, 2019). The uniform of riders moving on the streets becomes so familiar to Vietnamese through Grab's green, Go-Viet's red, or Be's yellow. Each company has its own price/discount policy, bonus regime and regulation. Therefore, the partners have many different reasons to join in or to come out in deciding to be a partner for a certain company (Q&Me company, 2018). This paper aims to discover and describe basically the factors influencing the decision of the riders in applying to such a high-tech transportation company and their assessment of policies and remuneration regimes.

**2. METHODOLOGY**

To build the model, two in-depth interviews with two shareholders of Grab and Go-Viet and one focus group with seven riders of different high-tech transportation companies operating in Ho Chi Minh City were conducted under semi-structured discussion.

To evaluate the model, the survey with well-structured questionnaire was carried out by person-administered method and through Google form. The respondents are the riders of different high-tech transportation companies. The sample size is two hundred and ten.

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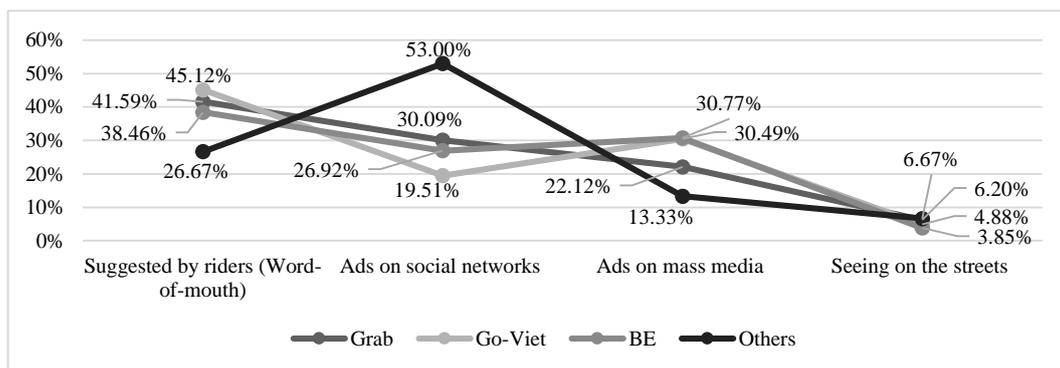
### 3. FINDINGS

Among two hundred and ten respondents, eleven are female (5.2%) and one hundred ninety-nine are male (94.8%). The ratio of male and female is very much different due to the very special requirements of this industry.

About their age, the highest percentage (50%) accounts for the range from twenty six to thirty five year old. The next is from eighteen to twenty five (24%) in which most of them are students studying at universities and colleges in Ho Chi Minh City. They participate in online driving because this is flexible job and helps them earning money for covering their lives, tuition and personal expenses without depending too much on families. The age from thirty six to forty five occupies just twenty percent (20%). And very few partners are over forty five due to restrictions on recruitment.

#### *How the partners know the high-tech transportation companies?*

The companies spend a huge amount of money to attract the partners toward them by many ways. The survey results show that suggestion from friends (word-of-mouth) is on the top of list (42%), followed by advertisement on social network (28%), advertisement on mass media (25%), and seeing riders running on the streets (5%). Each of these companies has its own policy and remuneration regimes for partners, so the new comers receive a lot of referrals from acquaintances.



*Source: Survey result (n=210)*

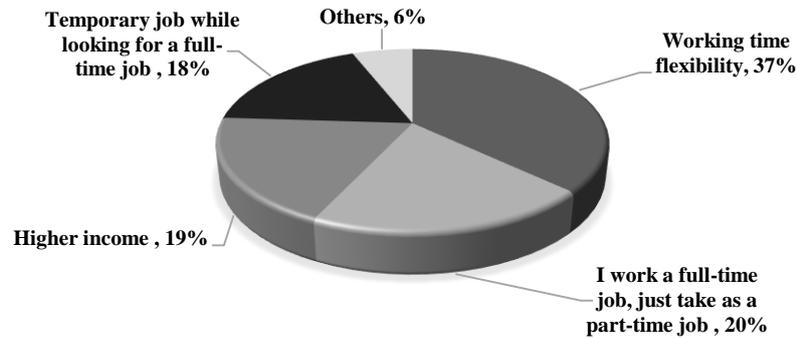
**Fig. 1:** Partners know high-tech transport companies through communication channels

Based on the Figure 1, the referral rate is very high in number, leading position is Go-Viet (45.12%), followed by Grab (41.59%). Grab is the most successful company in advertisement on social networks (30.09%). BE, the new enter to the market, is also using this medium to promote the brand and attract 26.92% of the total current partners. However, Go Viet is the most successful in advertisement on the mass media (30.49%), followed by BE (30.77%) through images on buses.

#### *Why the partners wish to join as riders for the high-tech transportation companies?*

The majority of driver partners (37%) choose a high-tech transportation company because of working time flexibility. They can start whenever they want. The group of people having stable job but would like to earn extra income in free time occupies of 20%. Besides that, the group looking for temporary work while waiting for a full-time job accounts for 18%. They are mainly just-graduated-students, on-going-students, and job-quit-officer.

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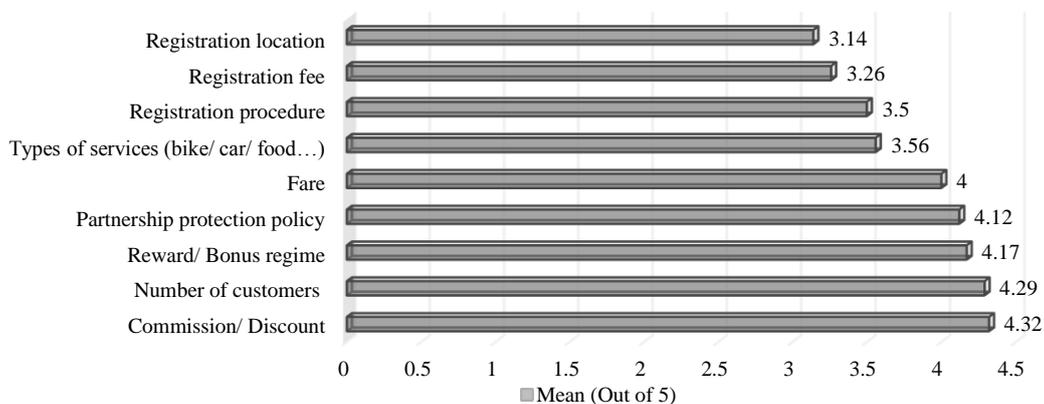
Source: Survey result (n=210)

**Fig. 2:** The reason the partners want to join as riders

This kind of work is autonomous in terms of time but provides enough income to farm the cost of family living (Tieu Phong, 2018). Among the interviewees, many are the former office workers but then quit job, switch to partners for transportation network company with the reasons of "more time for family or the work is not under much pressure" that are very emotional and spiritual benefits.

**Factors influencing on job application to the high-tech transportation companies**

The survey result show that the top five determinants affecting the job application as the riders of a specific high-tech transportation company are commission/ discount, number of customers, reward/ bonus regime, partnership protection policy and fare with the mean of 4.32, 4.29, 4.17, 4.12 and 4.00 respectively.



Source: Survey result (n=210)

**Fig. 3:** Factors influencing on job application

Actually, the reward/ bonus regime is mainly based on the rate of transporting customer and the number of riders activating app on their smart phone. The more the traveler increase, the more the rider shut down its app, the more the rider's income boom thank to the reward regime scaled by monetary level.

**Partner's assessment about the company they are cooperating with**

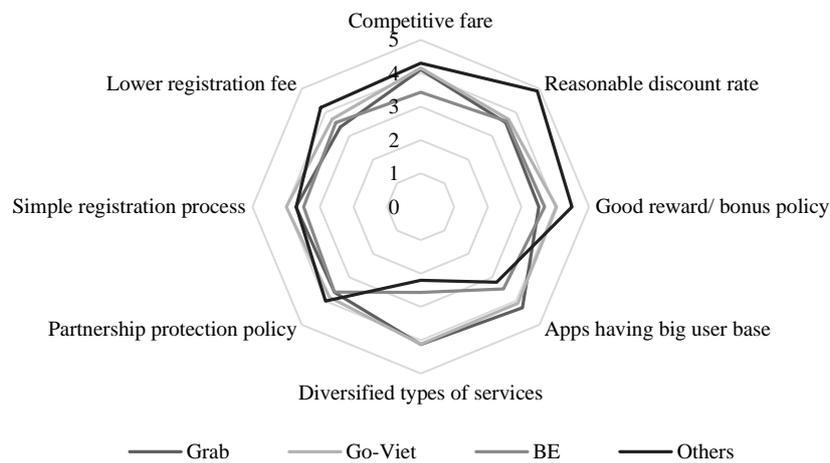
Survey results show that each company has its own selling point to attract partners such as Apps having big user base of Grab (4.28 out of 5), Competitive fare of Go-Viet (4.16), Good reward/ bonus policy of Be (3.68). The others like Fast GO who has reasonable discount rate (4.9).

Depending on the importance of that factors, partners choose companies to cooperate with.

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*Source: Survey result (n=210)*

**Fig. 4:** Partner's assessment about the company

In fact, discounts and bonus policies for partners constantly change according to corporate business strategy. During the period of market penetration, the high-tech transportation companies always attract partners by many ways such as good support for vehicles, very high bonus, and attractive promotion programs for customers. Therefore, the evaluation of the partners also fluctuate for the moment.

For instance, about the promotion programs, passengers traveling less than five kilometer pay only ten thousand Vietnam dong. On some special days, fast-registering passengers will receive for free zero Vietnam dong voucher... These programs are carried out regularly, continuously, so they greatly affect the passenger choice.

The survey indicates that, in general, most of riders are interested in their company's promotional policies, specifically 80% of Grab's partners interested in promotion policies (e.g. Grab, 2019), 89.19% of Go-Viet's partners, and 80.5% of BE's partners respectively.

#### **Loyalty to work**

Firstly, of the two hundred and ten samples, half of respondents said they have not determined exactly how their loyalty as partners is with the riding companies they are working for (49.5%). They are mainly students and office staffs wishing a higher standard living. One of the reasons is uncomplicated registration process. Secondly, there are 29.5% choosing stick with their job for long time because that is their daily joy in every single experience with customers and their right-hand job with a flexibility and proactive working time. Thirdly, there are 19% considering this work as a temporary left-hand occupation for a period of time to get more income. So they just stick for a few years. Finally, there are 1.9% of no idea people.

**Table 1: Loyalty to work**

	Long time	Only for a few years	Undefined	No idea
<b>Quantity</b>	62	40	104	4
<b>Rate</b>	29.5%	19.0%	49.5%	1.9%

## **4. CONCLUSION**

From the above research results, some conclusions could be given. That are the partners know about the high-tech transportation companies via acquaintances and through advertisements on social networks, mass media. The main reasons the partners chose this job are flexible working time, good opportunities to get more income in the free time. The most important factors affecting the applying decision as a rider are commission/ discount, reward/ bonus regime, and number of customers. Therefore, the high-tech transportation companies should focus on these concerns in order to attract more partners. Besides, they should build their own selling points such as increasing the diversity of provided services, competitive tariffs, attractive promotions, customer service quality to serve the users/ travelers as much as possible.

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Some other indispensable recommendations are supposed to be considered. In addition to the existing policies, the high-tech transportation companies should pay more attention on developing the multifunctional, easy, fast and stable apps and on creating more benefits to reduce conversion rate or retain longer its partners who work more than one year, for example frequently vehicle maintenance, good personal accident insurance/ health check including their closed family members (if possible with certain conditions) (Bao Giao Thong, 2019), incentive loyalty program together with KPI, and the soft skill classes about English language, communication, driving safety, identifying risks, basic self-defense for some dangerous situations.

Finally, last but not least, in the governance side, Ministry of Transport of Vietnam should complete the regulations (Labor Code amended in 2012) for the online ride booking companies to create a fair competitive environment and protect the partners participating in this carrier. In the meantime, it is hard to determine the relationship between the owners of online ride booking companies and drivers to calculate social insurance, health insurance, and unemployment insurance.

#### REFERENCES

- Advertising Vietnam. (2018). Thị trường giao đồ ăn trực tuyến: Cuộc đua ngày càng nóng bỏng. Retrieved May, 2019, from <https://advertisingvietnam.com/2018/12/thi-truong-giao-do-an-truc-tuyen-cuoc-dua-ngay-cang-nong-bong/>
- Bao Giao thong. (2019). Lái xe Grab tại Singapore được cung cấp BHYT miễn phí. Retrieved February, 2019, from <http://mt.gov.vn/khcn/tin-tuc/58706/lai-xe-grab-tai-singapore-duoc-cung-cap-bhyt-mien-phi.aspx>
- Binh An. (2018). Cuộc chiến App gọi xe. Retrieved April, 2019, from <http://genk.vn/cuoc-chien-app-goi-xe-go-viet-tuyen-bo-chiem-35-thi-phan-xe-2-banh-tai-tphcm-fastgo-noi-chiem-20-xe-4-banh-vay-thi-phan-cua-grab-con-bao-nhieu-20180922084617516.chn>
- CI Research. (2018). Tổng thể về các ứng dụng đặt xe đang có mặt tại thị trường Việt Nam. Retrieved January, 2019, from <https://www.brandsvietnam.com/congdong/topic/13998-CI-Research-Tong-the-ve-cac-ung-dung-dat-xe-dang-co-mat-tai-thi-truong-Viet-Nam>
- Grab Vietnam. (2019). Chương trình thưởng đối tác gắn kết 2019. Retrieved April, 2019, from <https://www.grab.com/vn/blog/driver/car/grabcar-tp-hcm-chuong-trinh-thuong-doi-tac-gan-ket-2019/>
- Q&Me company. (2018). Khảo sát về mức độ phổ biến của các ứng dụng gọi xe tại Việt Nam. Vietnam: Q&Me company.
- Tieu Phong. (2018). Tài xế Grab tại TPHCM thu nhập từ 600.000- 700.000/ngày. *Thanh nien*. Retrieved from <https://thanhnien.vn/tai-chinh-kinh-doanh/tai-xe-grab-tai-tphcm-thu-nhap-tu-600000-700000ngay-1001919.html>
- Tue An. (2019). Ứng dụng gọi xe be có hơn 10.000 tài xế ở hai TP lớn, tỉ lệ đặt chuyển thành công đạt hơn 80%. Retrieved April, 2019, from <https://vietnambiz.vn/ung-dung-goi-xe-be-co-hon-10000-tai-xe-o-hai-tp-lon-ty-le-dat-chuyen-thanh-cong-dat-hon-mot-nua-20190315175029357.htm>
- Younetmedia. (2018). Go-Jek vào Việt Nam – ghi điểm vì chiến lược “nội địa hóa” bài bản. Vietnam: Younetmedia.

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**VALUE CO-CREATION EXPERIENCES AND CUSTOMER SATISFACTION IN E-RETAILING SECTORS:  
THE MEDIATING ROLE OF PARTICIPATION BEHAVIORS**

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**Abstract**

In the last decade, e-retailing has been evolving significantly to provide consumers with autonomy to participate in creating their personalized and valuable experiences. This research aims to examining the effects of three types of value co-creation experiences, namely hedonic, social, and cognitive experiences, on consumer satisfaction with e-retailers via their participation behaviors. Furthermore, the mediating role of customer participation behaviors which include co-production and citizenship behavior is also investigated. Based on 549 usable questionnaires collected from customers in Vietnam, the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach is applied to analyze and test the proposed hypotheses. The analysis results reveal that, among three types of value co-creation experiences, cognitive experience has the strongest effects on both customer co-production and citizenship behavior which in turn influence customer satisfaction considerably. Both participation behaviors have mediating effects on the relationship between value co-creation experiences and customer satisfaction. Surprisingly, compared to co-production, citizenship behavior possesses a stronger positive effect on customer satisfaction. These findings provide important implications for e-retailers who would like to motivate customers to participate in co-creating value process.

**Keywords:** value co-creation experience; customer participation; co-production; customer citizenship behavior; satisfaction.

## 1. INTRODUCTION

In the last decade, e-retailing has been significantly evolving significantly to provide consumers with autonomy to participate in creating their personalized and valuable experiences with the company, called co-creation experiences. These experiences lead to the customer participation behavior (Nambisan and Baron, 2009), which in turn affect the customer satisfaction (Yi *et al.*, 2011; Frassetto-Deltoro, 2018). In spite of the fact that encouraging the customer participates in creating value is considered the next frontier in competitive effective strategies of a company (Dong *et al.*, 2007); in recent years, there are a lot of empirical researches relating to organizational co-creation that focus on employee behavior (Yi *et al.*, 2011), little research investigates the mediating role of customer value co-creation behavior, such as co-production and citizenship behavior in the relationship between their co-creation experiences and satisfaction. The aim of this paper is to give an empirical and conceptual study addressing the theme in the context of Vietnamese consumer environment.

## 2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Value co-creation is described as a desirable goal that assists companies in emphasizing the customer's point of view and in enhancing the front-end process of identifying their demands and desires (Payne, 2008). In the management literature, value co-creation is a new paradigm that brings both companies and their customers the value of experience through interaction (Galvagno and Dalli, 2014). Each customer receives different experiences depending on the degree to which their expected co-creation benefits are met (Verleye, 2015). Hedonic experience is known as a kind of experience that customers have when getting pleasurable benefits (Verleye, 2015), or/and intrinsic playful tasks (Füller, 2010) from co-creation behaviors. Cognitive experience is underscored by customers' expectations about product information (Verleye, 2015). Finally, interactions in virtual environments can bring to customers a social experience that refers to their enjoyment of connecting with like-minded people and establishing social relationships (Kohler *et al.*, 2011).

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Customer participation behavior is usually understood as the co-creation behavior that the customer is involved in producing and delivering a company's products or/and services (Dong *et al.*, 2007; Frasset-Deltoro *et al.*, 2018). This behavior can be classified into two types of voluntary co-creation behaviors: customer co- production and customer citizenship behavior (Yi *et al.*, 2011; Frasset-Deltoro *et al.*, 2018). In a broad sense, customer co-production is usually considered as customer participation behavior (Frasset-Deltoro *et al.*, 2018) referring to all the part of the process that customers involve and engage in co-creating value with the company. This study uses this term in a narrow sense, which refers to the customer behavior of sharing requirements to the company. This kind of behavior is good for both the firm and the customer. Compared to customer co-production, customer citizenship behavior contributes more extra value because it not only provides information to improve the company's operation (i.e. giving feedback and suggestions to the firm) but also shares knowledge, help and assistance to other customers (i.e. positive word-of mouth communication, suggesting service improvements) (Yi *et al.*, 2011). This behavior obtains three dimensions: Recommendations, feedback and helping others (Yi and Gong, 2008; Frasset-Deltoro *et al.*, 2018). According to Yi and Gong (2008), recommendations refer to what the customer gives valuable suggestions to friends or family members; providing feedback closely parallels providing information to make the company's service delivery process better; and helping others reflects the customer's altruism.

According to Frasset-Deltoro *et al.* (2018), involving in co-creation value activities can raise the customer's positive perceptions and their feelings of being closer to the firm as a part of the community, which enhances the satisfaction with his/her own co-creation performance. Similarly, in service recovery, Dong *et al.* (2007) demonstrated that customer participation behaviors can increase their satisfaction. Participation behavior can enhance the customer's satisfaction by increasing their benefits from sharing requirements to the company (Yi *et al.*, 2011) and helping other customers (Frasset-Deltoro *et al.*, 2018). Based upon these discussions, the research hypotheses can therefore be formulated as follows:

H1: Hedonic experience has a significant positive influence on a) customer co-production and b) customer citizenship behavior.

H2: Cognitive experience has a significant positive influence on a) customer co-production and b) customer citizenship behavior.

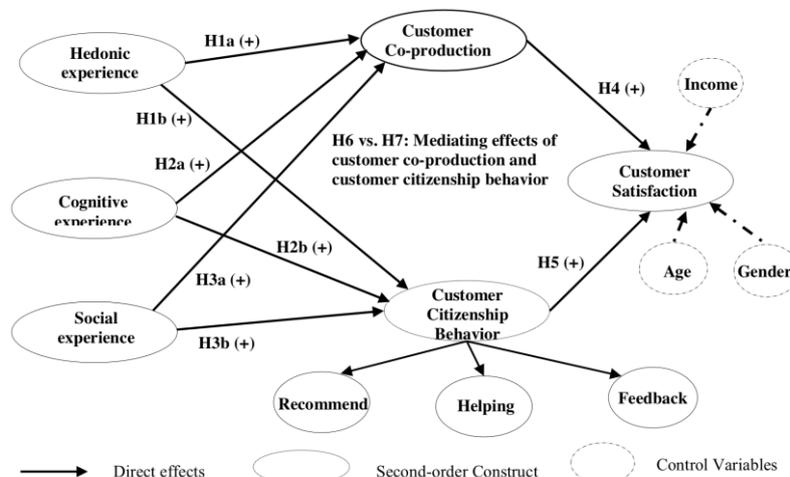
H3: Social experience has a significant positive influence on a) customer co-production and b) customer citizenship behavior.

H4: Co-production behavior positively influences the customer's satisfaction.

H5: Citizenship behavior positively influences the customer's satisfaction.

H6: Customer co-production plays the mediating role in the relationship between the customer value co- creation experiences: a) hedonic experience, b) cognitive experience, c) social experience and customer satisfaction.

H7: Customer citizenship behavior plays the mediating role in the relationship between the customer value co-creation experiences: a) hedonic experience, b) cognitive experience, c) social experience and customer satisfaction.



**Fig. 1:** Research framework and proposed hypotheses

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### **3. RESEARCH METHODOLOGY**

To verify the proposed hypotheses, a survey was used as the data collection method, both face-to-face and online survey. The measurement scales and survey questionnaire were adopted from the past studies and adjusted to the context of Vietnam. The questionnaire was originally composed in English, then translated in Vietnam.

Co-creation is reflected in (1) hedonic experience, (2) cognitive experience, and (3) social experience. Hedonic experience is reflected in three-item scale adapted from Ryan and Connell (1989). Cognitive experience is measured by adapting a six-item scale from Füller (2010). Social experience is measured with three-item scale adapted from Füller (2006) and Chan *et al.* (2010). Participation behavior is presented in (1) customer co- production and (2) customer citizen behavior. This construct adapted from Groth (2005). Customer co-production is reflected in five-item scale. Customer citizen behavior is a second-order construct. This construct was reflected in (1) recommendations, (2) helping, and (3) feedback that all were measured with four-item scale. Customer satisfaction is adapted from Lam *et al.* (2004) with a five-item scale.

Responses were captured using a seven-point rating scale ranging from “strongly disagree” (1) to “strongly agree” (7). There are 549 questionnaires met all the screening criteria.

### **4. RESULTS AND DISCUSSION**

The Partial Least Squares (PLS) technique, in particular the software package of SmartPLS (Ringle *et al.*, 2015), was employed as the main statistic tool for data analysis. The following reports the results of scale accuracy, research model quality (R<sup>2</sup>, Q<sup>2</sup>, and SRMR) and main direct effects. Acceptable reliability of all scales was demonstrated as  $\alpha$  values, composite reliability (CR) values and average variance extracted (AVE) indexes were all above the thresholds of 0.70, 0.70, and 0.50, respectively. The analysis results also showed good discriminant validity as well.

The quality of the proposed model was assessed through R<sup>2</sup> and Q<sup>2</sup> values as well as SRMR value. Furthermore, a t-test calculated from the bootstrapping procedure of 5000 samples was applied to examine the hypothesized effects, while Cohen’s Indicator (f<sup>2</sup>) was used to measure the effect sizes of the studied relationships. The analysis results revealed that all the hypotheses coefficients were supported, with a significant level and in a positive direction; and the strength of the studied relationships were from small to medium effect sizes (Cohen 1988; Henseler *et al.* 2009).

### **5. CONCLUSION**

The main contribution of this study is to bring an empirical evidence addressing the effect of customer value co-creation experiences on their satisfaction. The analysis results also confirm the mediating role of customer participation behaviors (co-production and citizenship behavior) in the relationship of the two variables. As expected, the two aforementioned behaviours are positively affected by three dimensions of customer co- creation experience (hedonic, social, and cognitive experience); among these, hedonic experience has strongest influence. Additionally, compared to co-production, citizenship behavior possesses a stronger positive effect on customer satisfaction. These findings provide important implications for e-retailers who would like to motivate customers to participate in co-creating value process. However, since the data is collected in a more collective culture context in Vietnam, the findings may not be applicable in a more individualism community, which paves the way for additional exploration of the current research framework in the future.

### **REFERENCES**

- Chan, K. W., Yim, C. K. (Bennett), & Lam, S. S. K. (2010), Is Customer Participation in Value Creation a Double-Edged Sword? Evidence from Professional Financial Services across Cultures. *Journal of Marketing*, 74(3), 48–64. doi:10.1509/jmkg.74.3.048
- Cohen, J. (1988), *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed., Lawrence Erlbaum Associates, New York, NY.
- Dong, B., Evans, K. R., & Zou, S. (2007). The effects of customer participation in co-created service recovery. *Journal of the Academy of Marketing Science*, 36(1), 123–137.

---

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---

- Frasquet-Deltoro, M., Alarcón-del-Amo, M.-C., & Lorenzo-Romero, C. (2018), Antecedents and consequences of virtual customer co-creation behaviours. *Internet Research*.  
Doi:10.1108/intr-06-2017-0243
- Fuller, J. (2006), Why consumers engage in virtual new product developments initiated by producers, *Advances in Consumer Research*, Vol. 33, 639-646.
- Füller, J. (2010), Refining Virtual Co-Creation from a Consumer Perspective, *California Management Review*, 52(2), 98–122.
- Galvagno, M., & Dalli, D. (2014), Theory of value co-creation: a systematic literature review, *Managing Service Quality: An International Journal*, 24(6), 643–683.
- Groth, M. (2005), Customers as Good Soldiers: Examining Citizenship Behaviors in Internet Service Deliveries, *Journal of Management*, 31(1), 7–27.
- Henseler, J., Ringle, C. and Sinkovics, R. (2009), The use of partial least squares path modeling in international marketing, in Sinkovics, R. and Ghauri, P. (Eds), *New Challenges to International Marketing*, *Advances in International Marketing*, Vol. 20, Emerald, Bingley, pp. 277-319.
- Kohler, T., Fueller, J., Matzler, K. & Stieger, D. (2011), Co-Creation in Virtual Worlds: The Design of the User Experience, *MIS Quarterly*, 35(3), 773.
- Lam, S. Y., Shankar, V., Erramilli, M. K., & Murthy, B. (2004), Customer Value, Satisfaction, Loyalty, and Switching Costs: An Illustration From a Business-to-Business Service Context, *Journal of the Academy of Marketing Science*, 32(3), 293–311.
- Nambisan, S., & Baron, R. A. (2009), Virtual Customer Environments: Testing a Model of Voluntary Participation in Value Co-creation Activities, *Journal of Product Innovation Management*, 26, 388-406.
- Payne, A. F. (2008), Managing the Co-Creation of Value, *Journal of the Academy of Marketing Science*, 36, 83-96.
- Ringle, C. M., Wende, S., & Becker, J. (2015). *SmartPLS 3*. Bonningstedt: SmartPLS. Retrieved from <http://www.smartpls.com>.
- Ryan, R. M., & Connell, J. P. (1989), Perceived locus of causality and internalization: Examining reasons for acting in two domains, *Journal of Personality and Social Psychology*, 57(5), 749–761.
- Verleye, K. (2015), The co-creation experience from the customer perspective: its measurement and determinants, *Journal of Service Management*, 26(2), 321–342.
- Yi, Y., & Gong, T. (2008), The effects of customer justice perception and affect on customer citizenship behavior and customer dysfunctional behavior, *Industrial Marketing Management*, 37(7), 767–783.
- Yi, Y., Natarajan, R. and Gong, T. (2011), Customer participation and citizenship behavioral influences on employee performance, satisfaction, commitment, and turnover intention, *Journal of Business Research*, Vol. 64 No. 1, pp. 87- 95.

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**STUDENTS' AWARENESS OF CYBERCRIMES IN VIET NAM BANKING SECTOR: THE EVIDENCE BY SEM ANALYSIS**

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**Abstract**

The research project recognizes customers about criminals using high technology in the banking sector in Viet Nam based on the survey results of individual customers who are university students in Ha Noi and Ho Chi Minh City. The purpose of the study is to identify factors that directly and indirectly affect students' awareness of cybercrimes in the banking sector and the degree of influence of each factor through SEM analysis. Hence, the study contributes to affirming the value of technology adoption model (TAM) and adding a research on internet banking in Viet Nam. The results show that as follows: (1) The perception of confidence, usefulness and attitudes towards students' awareness of cybercrimes in the banking sector varies widely from group to computer and internet users; for those who have different levels of dealing with banks, their perceptions of self-confidence and attitude are different; (2) group of customers who use internet banking security will have different feelings about risk factors, groups of students who have income and have no income have different views on social influences; (3) men and women have different feelings about self-confidence and attitude; (4) the perception of risks and attitudes among different income groups is different.

**Keywords:** *banking sector; students' awareness; cybercrimes.*

## 1. INTRODUCTION

The 4.0 (Industry 4.0) industrial revolution in the era of the Internet connecting all things and artificial intelligence (AI) has a breakthrough in technological development without precedent in history. This has the exponential development, global influence and is breaking the structure of most industries in every country. This has a profound impact on the transformation of the entire production, management and governance system of human society. In the banking industry, the technology revolution brings many great benefits such as: increasing the ability to provide modern products and services to customers through digital finance; big data helps access information, data, connectivity, collaboration; AI reduces costs, increases labor productivity. However, this also caused many difficulties when high-tech criminals became increasingly sophisticated. Crime of using high technology to attack the banking sector in the world in general and in Viet Nam tends to increase rapidly in both quantity and sophistication, complicated developments and many consequences serious.

In the face of these challenges, determining the factors affecting students' awareness of cybercrimes in the banking sector plays an important and necessary role in the current period. Accordingly, the study assesses the actual perception of students about the security situation when participating in high-tech bank services in order to identify the causes and limitations that exist, thereby building the solutions to improve students' efficiency and awareness of cybercrime in the banking sector. The subject of research is the awareness of 630 students studying at universities in Ho Chi Minh City and Ha Noi using mobile banking or online banking services to seek answers to two research questions as follows: (1) Which factors affect the ability of internet banking users at banks to be attacked by cybercrimes? and (2) How important are these factors affecting the decision to use internet banking service online?

The content of the study focuses on the basic issues related to the factors affecting the perception of students about criminals using high technology in the banking sector, including the following contents: (1) to systematize the theoretical basis of the students' cognitive influence on cybercrimes in the banking sector, the indicators of students' perceptions of cybercrimes in the banking sector; factors affecting students' perceptions of cybercrimes in the banking sector; (2) assessing the real situation of students' perception of cybercrimes in the banking sector; (3) on the basis of these assessments, address the reasons for the lack of awareness of cybercrime types, proposing groups of solutions to be implemented and policy suggestions to contribute

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to improving information security, safety of customers at banks and raising their awareness when participating in using high-tech bank services.

## **2. LITERATURE REVIEW**

### *Factors affecting awareness of cybercrimes in the banking sector*

There are six factors as follows: (1) student gender: The tendency to process and receive information available on social media is clearly divided based on gender differences (Kempf and Palan, 2006); (2) student age: The assessment of awareness by age will enhance the understanding of consumer behavior, when buying goods to implement strategic marketing. (San-Martín *et al.*, 2015; Yang *et al.*, 2015); (3) education level of student: Students have been chosen because they represent a segment of the general population who are highly educated people who use high-tech services (Jones and Chin, 2015); (4) income of students: Proper use of online news, forums and advice helps promote self-sufficiency, psychological empowerment, lifelong learning and higher quality of life (Carter and Yeo, 2016; Leung, 2010). The Internet offers users greater opportunities and resources to promote education, work and social status (Carter and Yeo, 2016; Lin *et al.*, 2016); (5) previous experience of students when using high-tech services: New customers face higher risks (Rogers, 2010); (6) student experience on security features at the bank: External risks are expected to negatively impact customer confidence on the usefulness of Internet banking services (Martins *et al.*, 2014).

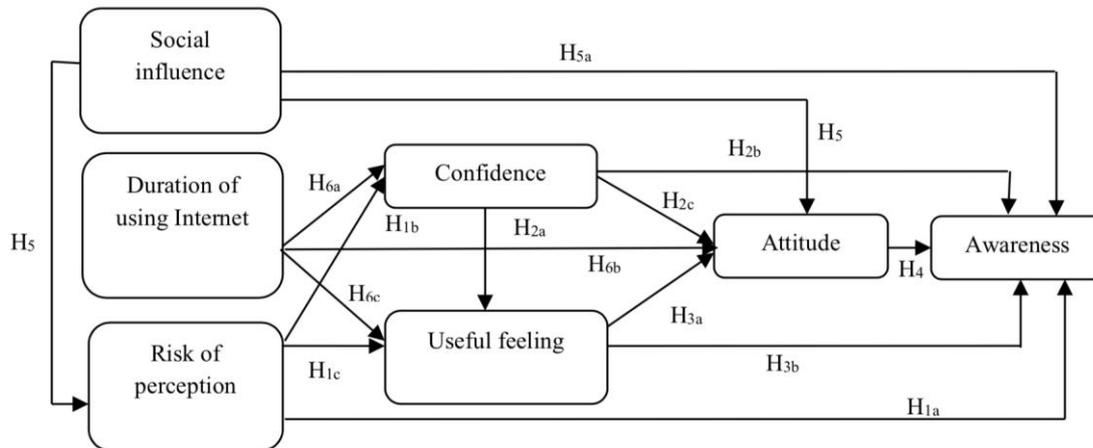
### *Ratios of students' awareness of cybercrimes in the banking sector*

There are two ratios as follows: (1) the level of understanding of high-tech bank services: It decides to the number of cybercrimes attacks, if the perception and the understanding level of using high-tech service is low then the risk of being cybercrimes scam is very high, and vice versa, when receiving The knowledge and level of users' understanding is great and will be vigilant, thus reducing many scams from cybercrimes; (2) the level of vigilance of students for cybercrimes: The level of vigilance of students about cybercrimes is currently quite low, the idols who are victims of cybercrimes attacks are students who do not major in IT or students with low alert levels.

## **3. METHODOLOGY**

On the basis of theory and models related to the topic, the authors conducted preliminary research with pilot test, develop questionnaires and scales to conduct research to investigate factors affecting students' awareness about cybercrimes in the banking sector. The scale used in the study is Likert scale of 5 points: 5 = very reliable; 4 = believe; 3 = indifference; 2 = not believing; 1 = very unbelievable. The study carried out the collection of secondary data from online survey questions and sent to students at universities and synthesized by excel software. Tests were conducted, including: Equal expenditure verification, Exploratory factor analysis EFA, KMO and Bartlett's testing, Analysis of Cronbach's Alpha reliability, SEM linear structure, Bootstrap method.

The original TAM model is used to analyze the factors that influence the adoption of a technology on the subjects used. However, for a relatively new service in Viet Nam such as using bank security to prevent cybercrimes, the rate of users is still very low, so studying that acceptance by customers is really impossible. Therefore, this study will use the TAM model to consider factors that influence cognition using bank security to prevent cybercrimes.



**Fig. 1:** Application theoretical model TAM

#### 4. EMPIRICAL FINDINGS

Finally, the topic confirms some findings as follows: (1) feelings of confidence, usefulness and attitude toward student awareness about cybercrimes in the banking sector are different for groups with different computer and Internet usage periods; For those who have different levels of transactions with banks, their feelings about the factors of confidence and attitude are also different; (2) the group of students who have used and used bank security will have different feelings about risk factors, the group of students representing science and technology objects who have income and no income have different views on weak social impact factor; (3) men and women have different feelings about the confidence and attitude towards students' awareness about cybercrimes in the banking sector; (4) the feeling of confidence is judged to be different between men and women; (5) the income factor is related to the perception of risks and attitudes, the difference between different income groups. In general, the study has obtained some results as follows: (1) affirming the value of TAM technology adoption model and adding a research on Internet Banking in Viet Nam; (2) the rationale for student awareness about cybercrimes in the banking sector, survey tools, proposed scale of high synthesis; (3) the thesis has inherited the previous studies and proposed a research model to recognize students about cybercrimes in the banking sector, which is relatively suitable for Viet Nam in general; (4) the number of survey samples is relatively large, thus facilitating easier research, while representing higher overall; (5) affirming relatively reliably the factors that directly and indirectly affect customer awareness about crime using high technology in the banking sector and the degree of influence on each factor through a deeper analysis tool SEM.

#### 5. CONCLUSION

From the results obtained, the study offers some implications for banks in cybercrimes prevention issues in the banking sector for customers in the area as follows: (1) the usefulness is the factor that has the strongest impact on the awareness of high-tech crimes so banks should aim at those who use bank security technology as mentioned above to implement introduce and promote the first banking security service, so that special customers who are students can gain a deep awareness of advantages and benefits when using high-tech services at banks to improve the trust of the bank's brand, bring big potential customers in the future; (2) following that, the factor of confidence also plays an important role in strengthening and raising awareness. In order to increase self-confidence as well as help customers especially, students always take an active role in all transactions, banks should constantly promote and propagate and guide customers when trading at the bank, so they can confidently control every situation as well as any unintended inclusions, thereby contributing to strengthening customer confidence and avoiding the risks of cybercrimes with each bank branch; (3) In order to receive a good attitude from customers, banks should pay more attention to the working attitude and behavior of each department in the organizational structure of the bank. To that end, customers who have different needs and purposes such as needing to consult interest rates, registering capital financing

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packages ... are all supported by the staff with polite and professional attitude. , providing a sense of security and always receiving the necessary support from the bank to avoid unfortunate cases of participating in high-tech bank services; (4) social influence is also an indispensable part to raise customers' awareness about cybercrimes, especially high-tech utilities that always receive the attention of customers. In order to avoid risks from cybercrimes, banks should use the bank's official websites to bring the most accurate information to their customers and to keep the security of the network confidential to avoid false cases. impersonating information, leading to bad consequences for customers and implications for the bank's reputation; (5) the bank should pay more attention to customer feedback in order to avoid the perceived risk of customers from the worries of being able to receive their banking information. Not only that, the timely solutions from the counselors as well as the operator also contributed significantly to limit the feelings of anxiety and give customers the necessary peace of mind; (6) and finally, the time to use high-tech services should also get interest from the bank to help customers avoid incalculable consequences from cybercrimes. Banks should limit waiting time when there is no response from internet banking or mobile banking users. That not only helps internet transactions become faster, but also helps customers secure their personal information in the face of incalculable threats from spyware.

The topic has not specifically studied and measured the impact levels of external variables related to individual characteristics such as gender, age, income, occupation, educational level, experience with computers and the Internet or the level of transactions with the bank to the use of security measures that the banking system uses for security. However, from the tests as well as the experience, referring to previous studies, the factors of personal characteristics are related to the access and use of security measures that the banking system uses. used for security of science and technology, therefore, banks need to consider and research these groups separately when deploying the development of private banking services. Banks can provide customers with more convenience through online channels to increase customer transaction levels by linking with online retailers or other non-financial companies.

## **ACKNOWLEDGEMENTS**

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## **REFERENCES**

- Deloitte (2018) What is Digital Economy? Unicorns, transformation and the internet of things Deloitte Malta Technology, 1-3.
- Bently, L. & Sherman,B. (2001) Intellectual Property Law, OUP (2001), at 1-2.
- Angayar Kanni Ramaiah(2017) Innovation, Intellectual Property Rights and Competition Law in Malaysia , South East Asia Journal of Contemporary Business, Economics and Law, Vol. 14, Issue4(December) 60-68.
- Edwin L.-C. Lai( 1996) International intellectual property rights protection and the rate of product innovation, Journal of Development Economics Vol. 55, 133–153.
- Jeremy de Beer (2016) Evidence –Based Intellectual Property Policymaking: An Integrated Review of Methods and Conclusions, Journal of World Intellectual Property ,vol 19.no 5-6, p 150-177.
- Susy Frakel (2014) Emerging Regulatory Issues Intellectual Property and Global Values Chains, Policy Quarterly, vol 10, Issue 4, p 28-32.
- Rokiah Alavi& Ida Madiha Abdul Ghani Azmi (2017) In Search for Support for the Extension of Copyright Term Under the Trans-Pacific Partnership Agreement, Journal of International Trade Law and Policy , vol 16, Issue 1, p 1-14.
- ERIA (2016) TPP, IPR Protection, and Their Implicaitons for Emerging Asian Economies, Policy Brief, p.1-8.
- Intellectual Property: A Power Tool For Economic Growthy, WIPO Publication, No.888 2002, p1-378.
- Dijana Jankovic (2017) Different Legal Aspects Of The Intellectual Property Rights, EU and Comparative Law Issues and Challenges, Vol 1, pl143-170.
- Mukhtar, S. Zainol. Z.A, Jusoh, S, Zahid, A. (2018) Review of Trademark and Its Enforcement Provisions under TRIPS. Journal of Asian Research, Vol. 2, No. 2.
- European Commission (2018), Report on the protection and enforcement of intellectual property rights in third countries, Brussel.



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*Digital Transformation – Opportunities and Challenges*

---

- Pilat, D. (2017) Opportunities and Policy Challenges of Digitalisation in Southeast Asia. OECD Southeast Asia Regional Forum.
- World Bank Group. 2018. Malaysia's Digital Economy: A New Driver to Development. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO.
- Shahbaz, M. S., Kazi, A. G., Othman, B., Javaid, M., Hussain, K., & Rasi, R. Z. R. (2019). Identification, Assessment and Mitigation of Environment Side Risks for Malaysian Manufacturing. *Engineering, Technology & Applied Science Research*, 9(1), 3851-3857.
- Priest, E. (2016) The future of music and film piracy in China. *Berkeley Technology Law Journal*, Volume 21, Issue 2, Pages 795-871.
- Lee, B. Fenoff, R. Paek, S. Y. (2019) Correlates of participation in e-book on campus, *The Journal of Academic Librarianship*. 45, 299-309.

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**DETERMINANTS OF ONLINE ENGAGEMENT: THE CASE OF FACEBOOK TRAVEL FAN PAGES IN VIETNAM**

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**Abstract**

Social media, especially Facebook, is an excellent mechanism to build a large audience of a certain interest and engage with them. Companies have leveraged Facebook brand official fan pages to maintain relationship with their customers by publishing content on a regular basis and fostering engagement. In this study, we investigated potential determinants of users' online engagement with content created on Facebook travel fan pages in Vietnam. We collected, observed and analyzed 405 posts published by 3 famous travel fan pages in Vietnam in a period on one month. Content analysis method and multiple regression were adopted to evaluate the influence of content type, media type and time frame on user engagement rate. Results indicate that content types (entertainment and social) significantly and positively determine the level of online engagement. Meanwhile, contrary to our expectations, media types (photos and videos) have no effect on user engagement of these fan pages. The day of publication, rather than publication time during the day, has positive influence on the engagement rate of users.

**Keywords:** Facebook; fan-page; online engagement; social media; tourism.

**1. INTRODUCTION**

Social media are significantly altering the way of searching, finding, reading, trusting, and co-producing information about travel knowledge and travel destinations among tourists and travelers (Zeng and Gerritsen, 2014). Facebook is considered the most favored social media with tremendous marketing potential in the US (Arnold, 2006). Social media such as Facebook, although effective to implement, requires research upfront to identify which approaches and content makes sense for industry, organization, and line of business (Andzulis *et al.*, 2012). Furthermore, content is considered to be successful when customers absorb, interact with it, and add value to it by sharing the content with others (Sashi, 2012; Scott, 2007; Simmons, 2008; Smith and Zook, 2011). However, less attention is paid to posting strategies implemented for Facebook pages of a general interest (in this case, it is traveling) to enhance customers' interactions. Therefore, the research's purpose is: (1) Analyzing the content of posts on Facebook travel fan pages in Vietnam in terms of content types, media types and time frame; (2) Determining what factors affect the online engagement on content posted on these Facebook travel fan pages and; (3) Suggesting some posting strategies for these pages to grow audiences and enhance customer engagement in long term.

To fulfill the above research objectives, four questions will be answered during our study:

- What are the common content types and media types on Facebook travel fan pages in Vietnam? What are the determinants of online engagement on Facebook travel fan pages in Vietnam?
- To what extent do those determinants influence online engagement?
- What are some posting strategies to generate high levels of online engagement?

**2. LITERATURE REVIEW**

**Theoretical backgrounds**

As mentioned by Lee *et al.* (2014), online travel communities contribute as a vital communication channel in the travel and tourism industry. It is because online travel communities have distinctive roles as follows: (1) allowing users to have access to knowledge and experience of particular destinations shared by other travelers (Chalkiti and Sigala, 2008; Chang and Chuang, 2011); (2) serving as collaborative platforms for decision-making procedures in which impartial information is offered about experiences of a certain tourism product or destination (Casaloa *et al.*, 2011); and (3) functioning as marketing tool and emotional intelligence to persuade people to travel (Litvin *et al.*, 2008; Tsai *et al.*, 2012). In this research, we will regard these online travel communities as Facebook travel fan pages.

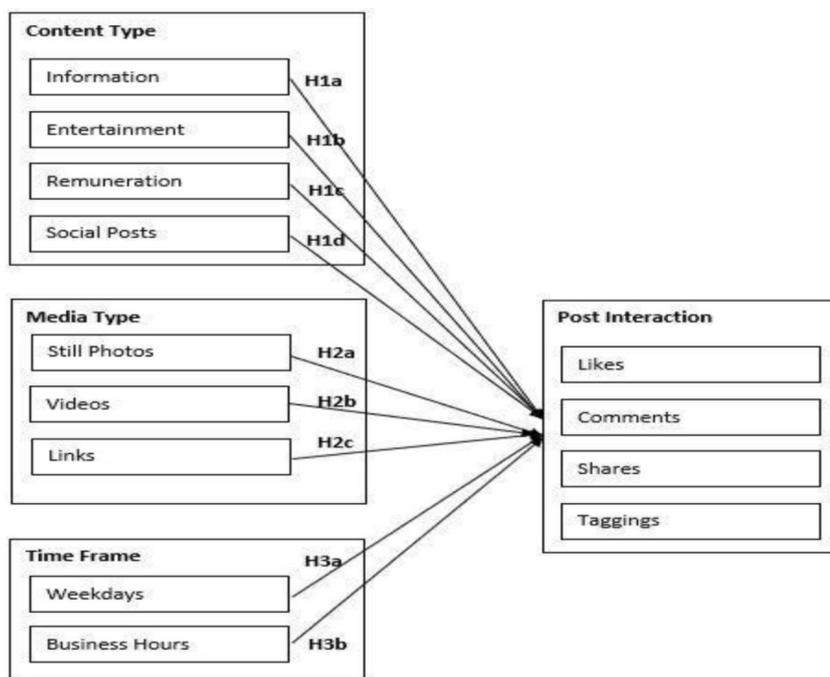
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**Conceptual model and hypotheses development**

*Conceptual model*



**Fig. 1:** Conceptual model on determinants of online engagement

*Hypotheses development*

*Content types*

Among previous studies on engagement determinants, Cvijikj and Michahelles (2011) recognized three distinguished types of content of posts on Facebook platform, including entertainment, information, remuneration. As revealed in recent researches (Chauhan and Pillai, 2013; Heinonen, 2011; Jeon *et al.*, 2016; Kujur and Singh, 2017; Luarn *et al.*, 2015), information and entertainment types of content have been significant drivers for the online engagement of brand pages. Hong (2011), in his research about users' motivations for communication in Facebook business pages, determined four different content categories: information posts, entertainment posts, remuneration posts, and social posts.

From the aforementioned literature, four types of content types are employed in our conceptual model: (1) Entertainment posts: posts aimed at entertaining and amusing consumers;(2) Information posts aimed at providing useful, functional information to consumers;(3) Remuneration posts: posts containing competitions, promotions, deals, offers to attract consumer attention;(4) Social posts: posts aimed at encouraging user engagement. This study propose first four hypotheses as follows:

- H1a. Informational posts positively influence online engagement rate.
- H1b. Entertainment posts positively influence online engagement rate.
- H1c. Remuneration posts positively influence online engagement rate.
- H1d. Social posts positively influence online engagement rate.

*Media types*

Sabate (2014) has emphasized the importance of photos in posts since images significantly affect engagement and turn customers into interacting activities- liking and commenting. As indicated in a research implemented by Brookes (2010), engagement increases 22% with image posts compared with video posts, while engagement increases 27% with video posts compared with text posts. Therefore, if a post contains videos, images and links, it generates more interactions from users than text-only posts do(Sabate,2014). Three hypotheses have been proposed to inspect:

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H2a. Posts having photos cause higher rate of online engagement.

H2b. Posts having videos cause higher rate of online engagement.

H2c. Posts having links cause higher rate of online engagement.

#### *Time frame*

Facebook platform contains abundant posts from friends, followed pages and other sources are constantly loaded on the newsfeed of users (and these posts with different levels of EdgeRank – in which time decay is an important variable – are fighting for the opportunity to appear on the newsfeed), scheduling concept-publication time is an critical element when evaluating determinants of online engagement (Kumar et al. 2016).

Golder et al. (2007) discovered that the majority of Facebook users' activities take place during weekdays. Rutz and Bucklin (2011) research also proves that the click-through rate of users drops markedly on the weekend. Likewise, Buddy Media Inc. (2011) showed that more than 86 percent of brand posts are published between Monday and Friday, generating user engagement rate 18 percent higher than that on the remaining days. Thus, the following hypothesis is proposed:

H3a. Posts published on weekdays cause higher online engagement rate.

Regarding when a post is published, in the study of Buddy Media Inc. (2011) and Golder et al. (2007), it is revealed brand posts published in the early morning or late at night receive a 20 percent higher rate of post interaction. In contrast, as argued by Cvijikj & Michahelles (2013), posts published during the time when activities of users are low could gain a place at the top of the newsfeed, and thus, are more likely to receive higher interaction level. Therefore, to assess whether posts published during working hours receive higher interaction, we propose the following hypothesis:

H3b. Posts published during working hours cause higher online engagement rate.

#### *Online engagement*

On official brand pages, users can interact with the post by (1) liking the published post to show interest, (2) commenting on the published post and (3) sharing the published post to their profile walls (Cvijikj and Michahelles, 2013). Liking and commenting on the post indicate active statements of Facebook users and these actions are visible in the public (Vries & Gensler & Leeftang, 2012).

Moreover, Facebook users can also tag their friends in comments so that those who are tagged will directly receive a notification of the post (Savage, 2015). This allows users to have conversations with those who also comment on the post, and to easily refer to several Facebook entities. Therefore, we propose this action (tagging/mentioning friends in comments under the post) as another important metric to measure online engagement. On the whole, this study has employed four metrics of interaction with fan page posts (likings, comments, shares, and tags) to measure the online engagement.

### **3. METHODOLOGY**

#### *Data collection*

To evaluate the mentioned hypotheses in previous chapter, we focused the study on Facebook travel fan pages. The page must be a travel community with content posted by page administrators in the travel industry, not a particular travel agency or brand in tourism. The page must have a relatively high number of likes and follows. Finally, the page must update and publish posts regularly. Therefore, we collect data from three well-known Facebook travel fan pages: Vietnam Travel (<https://www.facebook.com/vntravel/>), dulich.me - Tôi mê du lịch (<https://www.facebook.com/dulichme/>), and Check in Vietnam (<https://www.facebook.com/vietnamlovers/>).

The data were manually collected, in which posts posted in a period of one most recent month (from November 1st, 2018 to November 30th, 2018) are collected and collection date were within one week from December 15th to December 22nd. In total, 405 posts were collected and analyzed.

#### *Variables*

To empower the precision of linear regression testing, the online engagement metrics (which were collected as follows: like numbers, share numbers, comment numbers and the number of comments in which users tag their friends) are transformed by using natural logarithm for normal distribution. In accordance with previous research, the type of content observed in the post was categorized into four types: entertainment, information, remuneration and social (De Vries *et al.*, 2012; Le, 2018; Luarn *et al.*, 2015). To classify observed posts into these four different types of content, we adopted the manual coding method which

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follows the coding strategy developed by Glaser and Strauss (1967). For media types (links, photos and videos), the presence of media in a post decides the value of the variable. As regards publication day, data collected are differentiated between posts published on weekends versus those on weekdays. Likewise, regarding the publication time, there are differences between posts published in working hours versus those published beyond the aforementioned schedule.

#### **4. DATA ANALYSIS AND RESULTS**

##### *Descriptive analysis*

With regard to content types, out of 405 posts collected, posts containing information published by administrators accounted for the largest proportion (225 occurrences, accounting for 55.56 percent). Following by social posts (154 occurrences, accounting for 38.02 percent) which contained statements or questions aimed at encouraging audience to engage with the posts. Posts with entertaining content closely followed with 141 occurrences, accounting for 34.81 percent, while remuneration type appeared in 35 posts (8.64 percent). As for media types, posts with photos gained more popularity, with 207 occurrences (51.11 percent), followed by posts with videos (172 occurrences, 42.47 percent). Meanwhile, links in posts only accounted for 8.40 percent for 34 posts in total. Finally, most of the posts were published on weekdays (268 occurrences, 66.17 percent) and during non-business hours (236 occurrences, 58.27 percent). For an insight into how users engage with posts created by administrators on Facebook travel fan pages, results show that Facebook users engage by liking the posts far more frequently ( $M = 748.45$ ,  $SD = 1050.87$ ) compared to sharing ( $M = 152.87$ ,  $SD = 409.28$ ), commenting ( $M = 141.08$ ,  $SD = 290.28$ ) and tagging ( $M = 124.80$ ,  $SD = 272.85$ ).

##### *Hypotheses testing*

###### *Content type*

Obtained results in Table 5 indicate that content type was a significant factor for all measures of user engagement. Posts having information content type remarkably affected customer interactions. Therefore, H1a was supported. Next, posts with entertaining content were also found to be a potent driver for user engagement. Thus, H1b was supported. Remunerative content impacted substantially on engagement rate of Facebook users, however, had no effect on shares from Facebook users. Therefore, H1c was not supported. In terms of social posts from the observed data, posts having social content significantly and positively impacted online engagement measures. Thus, H1d was supported.

###### *Media type*

As regards media type, opposite to what we expected, obtained results from multiple regressions testing show that only links had relations with user interaction levels. Links negatively influenced likes, shares, comments. Thus, H2c was not supported. Posts with photos only had partially significant and negative impact on likes, while having no influence on the other three online interaction measures. Therefore, H2a was not supported. Also, no effect on online engagement was found to exist when it comes to videos. Thus, H2b was not supported.

###### *Time frame*

As for the day of the week on which posts were published, publication day had no effect on likes, but had positive and significant impact on shares, comments, and tags. Therefore, H3a was supported but only partially. Regarding publication time, the time when the posts were published only had impact on likes while no effects were found on shares, comments and tags. Therefore, H3b was partially supported.

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**Table 5:** Multiple regression results for the effects of content types, media types and time frame

Dependent variables	Likes	Shares	Comments	Taggings
Information	0.362**	0.583***	0.753***	0.889***
Entertainment	0.947***	0.714***	0.901***	0.903***
Remuneration	-0.832***	-0.289	-0.826***	-0.817***
Social	0.485***	0.545***	0.771***	0.724***
Photos	-0.692*	-0.687	-0.691	-0.575
Videos	-0.337	0.011	-0.316	-0.188
Links	-1.269***	-1.931***	-2.314***	-2.241***
Day	0.034	0.374*	0.343*	0.438**
Time	0.256*	0.178	0.253	0.228
R-square	0.257	0.219	0.271	0.246
F-value	15.212***	12.3***	16.276***	14.334***

Note: This table reported unstandardized coefficients. \*p < 0.1; \*\*p < 0.05; \*\*\*p < 0.01.

## 5. CONCLUSION

The research is aimed at analyzing the content of posts on Facebook travel fan pages in Vietnam and to investigate what are the determinants of online engagement on these pages. Results indicate that all the content types have significant relationship with customer engagement, except for the correlation between remuneration and shares. Surprisingly, media types besides links do not contribute to customer interactions. Furthermore, whilst publication day affects on shares, comments, tags and have no relationship with likes; publication time only had impact on likes. The outcome of the present study is to help travel fan pages in Vietnam determine the posting strategies they should focus on to grow their audience and engage with them for the long term. There are two limitations of this research that require further research. One limitation is about the scale of the research. Since the research is conducted on Facebook travel fan pages in Vietnam, the scale is not large enough. The other one is that this research assumes that all posts are not paid content.

## REFERENCES

- Andzulis, J. "Mick", Panagopoulos, N. G., & Rapp, A. (2012). A review of social media and implications for the sales process. *Journal of Personal Selling & Sales Management*, 32(3), 305–316
- Chalkiti, K. and Sigala, M. (2008). Information sharing and idea generation in peer to peer online communities: The case of 'DIALOGOI'. *Journal of Vacation Marketing*, 14(2), pp.121-132.
- Chang, H. and Chuang, S. (2011). Social capital and individual motivations on knowledge sharing: Participant involvement as a moderator. *Information & Management*, 48(1), pp.9-18.
- Chauhan, K., & Pillai, A. (2013). Role of content strategy in social media brand communities: A case of higher education institutes in India. *Journal of Product & Brand Management*, 22(1), 40-51.
- Cvijikj, I.P. and Michahelles, F. (2013). Online engagement factors on Facebook brand pages. *Social Network Analysis and Mining*, 3(4), pp.843-61.
- De Vries, L., Gensler, S. and Leeflang, P.S.H. (2012). Popularity of Brand Posts on Brand Fan Pages: An Investigation of the Effects of Social Media Marketing. *Journal of Interactive Marketing*, 26(2), pp.83-91."
- Kumar S, Jacob VS, Sriskandarajah, C. (2006). Scheduling advertisements on a web page to maximize revenue. *Eur J Oper Res*, 173(3), pp.1067–1189.

---

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*Digital Transformation – Opportunities and Challenges*

---

- Luarn, P., Lin, T.M.Y. and Chiu, C.-M. (2015). Influence of Facebook brand-page posts on online engagement. *Online Information Review*, 39(4), pp.505-19.
- Rutz, O. J., & Bucklin, R. E. (2011). From generic to branded: a model of spillover in paid search advertising. *Journal of Marketing Research*, 48(1), pp.87–102.
- Sabate, F., Berbegal-Mirabent, J., Canabate, A. & Lebherz (2014). Factors influencing popularity of branded content in Facebook fan pages. *European Management Journal*, 32 (1), pp.1001-1011.
- Sashi, C. M. (2012). Customer engagement, buyer-seller relationships, and social media. *Management Decision*, 50(1–2), pp.253–272.
- Simmons, G. (2008). Marketing to postmodern consumers: introducing the internet chameleon. *European Journal of Marketing*, 42(3), pp.299–310.
- Smith, P. R., & Zook, Z. (2011). *Marketing communications: integrating offline and online with social media*. Kogan Page, London.