

A CONCEPTUAL PAPER FOR SELF-SERVICE TECHNOLOGY (SST) ON GRABCAR USERS

Nur Dalila Mukhtar¹, Asyraf Afthanorhan^{2*}, Puspa Liza Ghazali³, Hazimi Foziah⁴

^{1,2,3,4}Faculty of Business and Management, Universiti Sultan Zainal Abidin (UniSZA), Kuala Nerus, Terengganu, Malaysia.

Email: ¹nurdalilamukhtar@gmail.com, ^{2*}asyrafafthanorhan@unisza.edu.my, ³puspaliza@unisza.edu.my, ⁴hazimi@unisza.edu.my

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Abstract

Purpose of the study: The main purpose of this study is to explore the suitability of the self-service technology (SST) factor in transportation marketing research. SST is a novel theory that initially was developed for technology devices. Thus, SST is carry on to examine their usefulness on customer satisfaction and loyalty.

Methodology: This research paper is conceptually based on a critical review of self-service technology, customer satisfaction and loyalty toward the Grabcar services in East Coast Malaysia.

Main Findings: The researchers propose a model where the self-service technology is accounted for from two different dimensions (Functionality and Enjoyment). This study also makes an attempt to relate all these factors in determining the loyalty of the customers.

Applications of this study: This study will enable the decision-maker to understand better ways to increase the satisfaction of the customer.

Novelty/Originality of this study: This study offers a theoretical framework for applied researchers who are interested in transportation marketing. As SST becomes popular during Industrial Revolution 4.0, this is the right time to promote a new model for investigation purposes.

Keywords: Self-Service Technology, Service Quality, GrabCar, Customer Satisfaction, Structural Equation Modeling.

INTRODUCTION

Most of the marketing researchers believe that the service quality always plays a key role in the decision-making process of customers, before simulating both affective and behavioral domains (Aziz et al., 2019). Thus, service quality is essential not only to capture the attention of any customers but also encouraging satisfaction and loyalty in potential repeat customers. There are numerous researches that addressed the importance of service quality of marketing research.

Recently, service quality is not only about the physical condition but also can be determined by the system used provided by the firms. For this example, Lin & Hsieh (2011) introduce a novel theory of service quality by focusing more on a technology device that is called Self-Service Technology (SST) service quality. It is generally accepted that the creation of SST service quality is the result of the use of service quality tools by various applications embedded in education institute, tourism, hoteling, banking, food delivery service, transportation and so forth. An effective technology device will increase its attractiveness to potential customers and also for repeat customers.

Since SST service quality models are considered as the most prominent construct across research fields in different regions (Parasuraman, Zeithaml, & Berry, 1988; Afthanorhan et al., 2019), so do questions concerning on their usability to transport sector in Malaysia. These questions are even more intensive when Malaysia is progressively toward the Industrial Revolution 4.0. According to Lasi et al. (2014) and Vaidya, Ambad, & Bhosle (2018), the Industrial Revolution 4.0 is expected to change how the human lives, works, and communicate where there is potential to create a new job, add value to the product, raise productivity, improve social welfare, enhance transportation and mobility and more broadly to generate income nation (Guerrero, Rialp, & Urbano, 2008). The benefits of Industrial Revolution 4.0 apply to transportation as well, in that, by means of mobility activities, various drivers of different sites can respond to customer needs, thereby contributing to customer travel experiences.

This is perceived to be particularly important for developed and developing countries where there are useful for customers who have difficulty traveling. To ensure continuous support for this customer, the academics and practitioners need to know how effective these services provided as well as what factors stimulate the customer to use the GrabCar application. Given the significance of these services, the focus of this study is to explore how the efficacy of Self-Service Technology toward the GrabCar users, emphasizing that the greater the Self-Service Technology, the higher satisfaction of customers (Musso, 2010; Grewal & Levy, 2009). In furthers, SSTs could be more beneficial to the full-time students or part-time workers, helping them to increase the monthly income with fewer resources resulting in an increase in mobility activities.

LITERATURE REVIEW

Underpinning Theory

For the last three decades, the applied researchers have aimed to understand, predict, estimate, and explain the relationships between service quality and customer satisfaction at organizational levels (Parasuraman, et al., 1988). Other behavior theories move away from explaining these relationships to focus either on the behavior itself in which they occur. As such, a substantial amount of service quality theories has been expanded and used to exploit the determinant across research fields.

Methodological Issue in developing a research framework

The studies depicted in Table 1 come from prominent databases such as Scopus, Springer, Science Direct and other sources. The studies are chosen based on their relevance for this scope of study which is more highlighted on self-service technology and also subjected to the transportation industry. This comprehensive review includes the sample size, number of items, statistical methods, variables and outcome of the studies. Since the SST service quality has gained tremendous dissemination across research disciplines, this study more interested to take the relevant studies from 2016-2020. Using these databases, 369 documents were found that discuss SST service quality but only 11 documents are related to the transportation industry. Among these documents, 3 documents were excluded from being researched as some of the paper showing a similar topic and full text of the document is not available. Thus, the 8 studies have been reviewed as shown in Table 1.

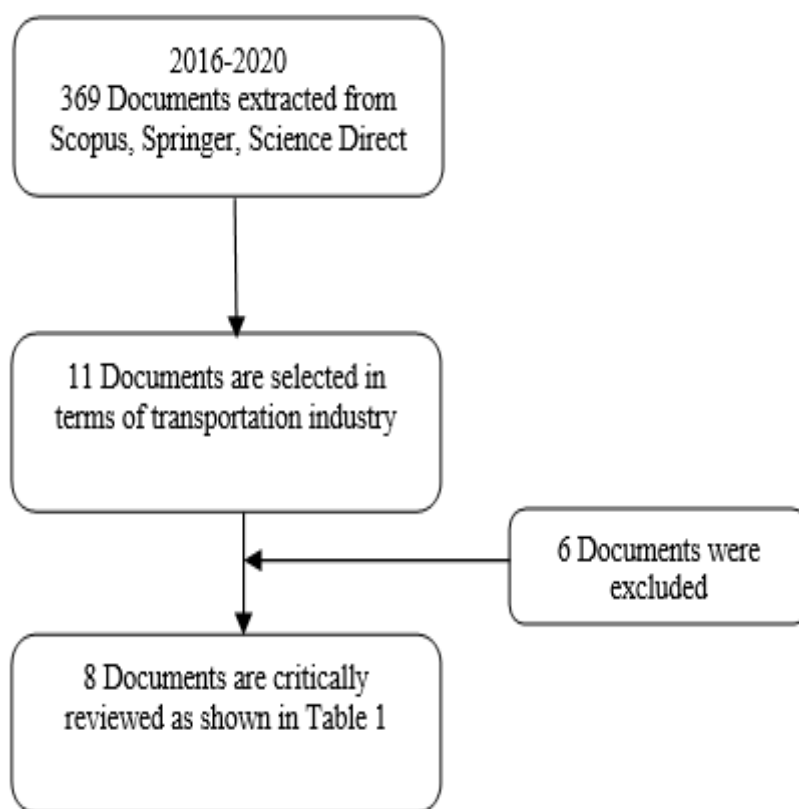


Figure 1: Flow chart on selecting the paper

Table 1: Summarization related works in the field of Self-Service Technology

Studies	Sample	Original Item Battery	Statistical Method	Final Number of Dimensions	Variables	Results
Suzianti & Chairunnisa (2018)	375 respondents	20 items	Importance Analysis	7 Dimensions	1. Functionality 2. Enjoyment 3. security/Privacy 4. Assurance 5. Design 6. Convenience 7. Customization	12 out of 20 items belonged to the attractive category

Chen & Wang (2016)	313 respondents	23 items	Covariance based Structural Equation Modeling	None	1. Customer Participation 2. Enjoyment 3. Economic 4. Relational 5. System Satisfaction 6. Company Satisfaction 7. Customer Loyalty	All Independent variables are a significant impact on Customer Loyalty
Bogicevic et al., (2017)	353 respondents	17 items	Covariance based Structural Equation Modeling	3 Dimensions	1. Self-Service Technology 2. Supporting Technologies 3. Enjoyment 4. Confidence 5. Satisfaction	All independent variables are a significant impact on Satisfaction
Yuen, Wang & Wong (2019)	230 respondents	19 items	Covariance based Structural Equation Modeling	4 Dimensions	1. Convenience 2. Privacy 3. Security 4. Reliability Intention 5. Perceived Value 6. Transaction Cost	Convenience, privacy security, and reliability on intention are mediated by perceived value and transaction cost
Gures, Inan, & Arslan (2018)	429 respondents	13 items	Covariance based Structural Equation Modeling	None	1. Functionality 2. Enjoyment 3. Speed 4. Actual Usage	All independent variable is a significant impact on Actual Usage
Ueda & Kurahashi (2017)	400 samples	None	Fuzzy Inference System Regression analysis Agent-based Model	None	Moderator variables: 1. Demographic Data 2. Travel Conditions 3. Heuristics Independent variables 1. Usefulness 2. Ease of Use 3. Attitude toward SST	Agent-based model much preferable to explain the decision-making process by individual
Kuo & Jou (2018)	598 respondents	6 items for self-serve check-in services	Cross-check analysis One-way ANOVA	None	1. Check-in Service 2. Willingness to pay 3. Age 4. Occupation 5. Personal Monthly Income 6. Flight destination	All independent variables have significant differences with the willingness to pay
Jiang et al., (2020)	315 respondents	None	Partial Least Squares Path Modeling (PLS-PM)	4 Dimensions	1. Urban Intelligent Transportation System	All independent variables are a significant

2. Internet of Thing Service	impact on SCM systems
3. Cloud-based Service	
4. Urban Knowledge	
5. The success of SCM Systems	

Discussion on the use of Statistical Methods

Studies of SST service quality use a variety of research methods-quantitative, qualitative and mixed. According to prior studies from 2016-2020, all the studies apply the quantitative method to carry on their research. Based on the output from Table 1, 50% of the prior studies using Covariance Based Structural Equation Modeling (CBSEM), while other studies using Partial Least Squares Path Modeling (PLS-PM), One-way ANOVA, Regression Analysis, Fuzzy estimation, and Importance analysis. In particular, both CBSEM and PLS-PM are known under structural equation modeling methods but these methods have been distinguished based on the conceptualization of the measurement model and purpose of the study. It seems that most of the studies using an established theory to test the hypothesis ([Dalila et al., 2020](#)).

Therefore, the researchers also will apply Structural Equation Modeling (SEM) to validate the measurement model and thus analyze the causal effect of each construct involved in the study. Following this method, the Post-Hoc analysis is carried out to investigate further the impact of the proposed model when implementing it in terms of the transportation context. The Post-Hoc analysis requires a categorical variable for comparison purposes. Based on this, the applied researchers can identify which group has shown pronounced in contributing to the impact of the research model.

Discussion on the use of Sampling Methods

All studies use probability technique (e.g; simple random, systematic, cluster, and stratified method) for data collection which target customer who experiences with technology device for their surveys. These respondents were asked to answer all the questions on perception after using the device. Many of these studies use the sample size in between 230 and 598 samples through a direct questionnaire. Some of the studies rely on [Krejcie and Morgan \(1970\)](#) approach to determine the minimum number of sample size rather than other updated approach that are more efficient in detecting the sample sizes though they using the hybrid method for empirical analysis.

Following these common practices, this study will apply the probability method to generate samples that were representative of the whole population that much focus on the east coast of Malaysia peninsular. That is, the cluster sampling technique is selected as the best sampling method for this study. Kelantan, Terengganu, and Pahang served as the states of interest for this study because they share a similar culture that represents the east coast region in Malaysia. Research findings differences between states with similar cultures permit us to make a more convincing argument than performing a study with differing cultures. According to [Podsakoff et al. \(2015\)](#), research with different cultures could lead to capitalization on chance effect which biases the result that tends to limits the generalizability of findings.

The unit of analysis of this study is the customer using the GrabCar services. The respondents were approached at the nearby station and were asked to participate in a survey. All the information individual responses were to be kept confidential and they were told about the purpose of this investigation. As this survey was conducted in three states, the two versions of the questionnaire were administered. The survey is written in English and Bahasa Malaysia whose majorities of the respondents are local. The total sample for this study is quite high because the numbers of GrabCar users were large, which are expected more than 10,000 people. Thus, the study also uses Krejcie & Morgan approach to get the sample size and then validated by the use of Cohen and Hair's approach.

Discussion of Dimensionality

As noted, most of the prior studies have sub-domain for SST service quality that is evaluated using Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA). The CFA method is used when the researchers apply the SEM method to test the research hypothesis, whereas the EFA method is utilized when the researcher applies other quantitative methods. Nevertheless, the EFA method has major shortcomings ([Aimran et al., 2017](#)). First, the value of factor loadings produced from EFA is not measured as a factor but more treated as a composite which makes the results are not unique. Second, the EFA cannot provide the global fit of fitness as shown in the CFA method to evaluate the measurement model ([Majid et al., 2019](#)). Thus, the researchers cannot identify the suitability of the proposed model with the data at hand. Third, the EFA can draw the correlation between variables in a model but likely incompatible to the hierarchical component model (higher-order constructs). Fourth, the reliabilities and validities cannot be performed as easily applied with the CFA method ([Mohamad et al., 2019](#)). Thus, following to these reasons, the researchers decided to apply the CFA method for this study.

Discussion on Generation of Variables and Items

Because SST service quality is generally a new concept, the number of scale items are varying based on different approaches conducted such as preliminary interviews, focus groups, and experts. From Table 1, the higher number of items is 23 by [Chen & Wang \(2016\)](#). Most of the studies retain all items to measure the SST service quality construct that is derived from the factor analysis method. It means the items produced by these studies can be taken for further research as shown in Table 2.

As the survey was conducted in three states which involve the local and international respondents, the bilingual version of the questionnaire was administered. The original questionnaire was written in the English version, but then the translation of Bahasa Malaysia was added at the below sentence of English. The translation was translated by bilingual people whose native language was English and Bahasa Malaysia. These two versions were then compared and contrasted for clarity purposes. It was found that no item contains specific cultural context in terms of language ([Brislin, 1980](#)). After that, the scale of measurement for each item in a survey was evaluated by the expert of measurement. The purpose of this method is to warrant the use of the Likert scale on each item. All constructs in a survey were measured with the item using 10-point Likert scale ranging from 1=strongly disagree to 10=strongly agree.

Table 2: Item in the questionnaire

Original Item	Sources
Functionality	
FUN-1. I can get my service complete with the firm's SST within a short time	Iqbal et al. (2018) ; Lin & Hsieh (2011) ; Considine & Cormican (2016) ; Huang & Martin-Taylor (2013)
FUN-2. The service process of the firm's SST is clear	
FUN-3. The service process of the firm's SST is understandable	
FUN-4. I do not have much effort using the firm's SST	
FUN-5. I can use SST service completely	
FUN-6. Sometimes I confuse with the firm SST function	
Enjoyment	
ENJ-1. The operation of the firm's SSTs is exciting	Iqbal et al. (2018) ; Lin & Hsieh (2011) ; Chih-Hung Wang (2012) ; Franke & Schreier (2010) ; Dickinger, Arami, & Meyer (2008)
ENJ-2. I feel good being able to use the SSTs service	
ENJ-3. SSTs have interesting additional functions	
ENJ-4. I can get all relevant information from SST	
ENJ-5. I like with the SST appearance	
ENJ-6. The image by SST service is updated	
ENJ-7. I enjoy with all application in SST	
Customer Satisfaction	
CS-1. Overall, I am satisfied with the self-service technologies offered by the firm	Afthanorhan et al., (2019) ; Fornell et al., (1996) ; Asnawi et al., (2019) ; Hadi, Aslam, & Gulzar (2019) ; Huang, Lee, & Chen (2019) ; El-Adly (2019) ; Hult et al. (2019)
CS-2. The self-service technologies offered by the firm within my expectations	
CS-3. The self-service technologies offered by the firm are close to my idea	
CS-4. I am truly satisfied with this SST as a transportation service	
CS-5. I am satisfied with the improvement of SST this year	
CS-6. I am confident that my friends would satisfy with my recommendation	
CS-7. I am sure this is the best SST ever	
Customer Loyalty	
LOY-1. I would use this SST again	Cronin et al. (2000) ; Afthanorhan et al., (2018) ; Asnawi et al., (2019) ; Hadi, Aslam, & Gulzar (2019) ; Huang, Lee, & Chen (2019) ; El-Adly (2019) ; Hult et al. (2019)
LOY-2. I would recommend this SST to any of my friends	
LOY-3. I would recommend this SST to any of my colleagues	
LOY-4. If I need to use again, I would come to the SST	
LOY-5. I would speak positively about this SST to others	
LOY-6. This SST is my preferred choice	
LOY-7. I would suggest this SST to my families	

DEVELOPMENT OF RESEARCH MODEL

SST Service Quality

The service providers introduced the technology-enabled device to provide convenient services to their customers in obtaining good productivity and satisfaction (Tsou & Hsu, 2017; Hien, 2014). For this example, Self-Service Technology (SST) was now penetrated in various sectors to equip the customers' needs. During the ten years ago, SST was introduced for the service sector industry (Leung & Matanda, 2013) but recently its efficacy has been utilized for other sectors. SST can replace direct contact between customers and suppliers from different places anytime. Moreover, this application needs fewer resources to apply which very comfort for the customers in need (Martins, Oliveira & Popovič, 2014). It allows the customers to make a decision conveniently and avoid bringing a lot of cash for the payment.

The SST introduced by service providers is associated with service quality measurement. The review and discussion for service quality dimensions have emerged in various research fields for more than thirty years. The idea of this measurement was originated from Parasuraman et al. (1985) which focus on the banking sector but its scale was currently extended for other sectors. Generally, the service quality was assessed by five different dimensions which include Reliability, Responsiveness, Assurance, Empathy, and Tangibility. Hence, the service quality construct was renamed as "SERVQUAL" which always regarded as the most well-developed measurement (Afthanorhan et al., 2018).

In order to improve customer satisfaction and customer loyalty toward services provided and to decreasing the expenses for service quality enhancement, the SST service quality is being offered by organization and individual (Ryu, Lee, & Gon Kim, 2012). It allows the customer to get free charge of services from the involvement of service employee which also could minimize the cost related to their operations (Weijters et al., 2007). A variety of interfaces includes information kiosks, attractive digital photo, music, internet banking and Paypal across the world. This SST service quality would provide a broad array of choices to their customers in terms of when and how to get the services.

In the present study, SSTQUAL theory is used for hypothesis testing. SSTQUAL theory was introduced by Lin & Hsieh (2011) which is explicitly emphasizing the quality of service provided by SSTs as shown in Figure 2. In addition, previous studies had confirmed that the reliability and validity test for this scale is truly robust in different contexts through substantial diverse samples across the industries (Kumar & Mittal, 2015; Considine & Cormican, 2016; Radomir & Nistor, 2014). The SSTQUAL contains 20 items and seven dimension sub-constructs named Customization, Assurance, Functionality, Enjoyment, Security, Design and Convenience which also directly influences customer satisfaction and loyalty. But, from all dimensions, the two dimensions (Functionality and Enjoyment) were selected as they were more relevant for this study. Thus, it is hypothesized as:

H1: SST Service Quality has a significant effect on Customer Satisfaction

H2: SST Service Quality has a significant effect on Customer Loyalty

H3: Customer Satisfaction has a significant effect on Customer Loyalty

SST Dimensions

In order to obtain a deeper understanding of the process by which customers need to use the SST, the research model shown in Figure 2. This study proposes seven dimensions under SST as predictors of customer satisfaction and loyalty. Those dimensions have been explored in the SST literature; however, customer satisfaction and loyalty were taken from the Theory of Reason Action (TRA). The SST construct was expected to extend the research model based on the TRA model. In addition, it was expected that the SST and customer satisfaction have a positive impact on customer loyalty as shown in Figure 2. Specific hypotheses based on the proposed model are discussed next.

Functionality

Functionality has been defined as a system capability that facilitates the organization to meet their needs (Lu, Wang & Hayes, 2012). Using grab car application, the users can gain the information to fulfill their needs. In other words, as service functionality increases, so it will increase the ability to assist the customer's needs (Cenfetelli, Benbasat & Al-Natour, 2008; kosiur, 1997; Saban & Rau, 2005). Thus, it is hypothesized:

H1a: Functionality has a significant effect on Customer Loyalty

Enjoyment

According to Huang (2003), the enjoyment factor can be seen as the extent of an activity of using technology devices that is personally enjoyable from the value of technology. From this example, Matilla and Wirtz (2000) showed that customer initial reaction would lead them to positive affection and eventually affect the behavioral factor. It means that when the perceived enjoyment of grab car application increases, customer satisfaction, and loyalty would also increase.

H1b: Enjoyment has a significant effect on Customer Loyalty

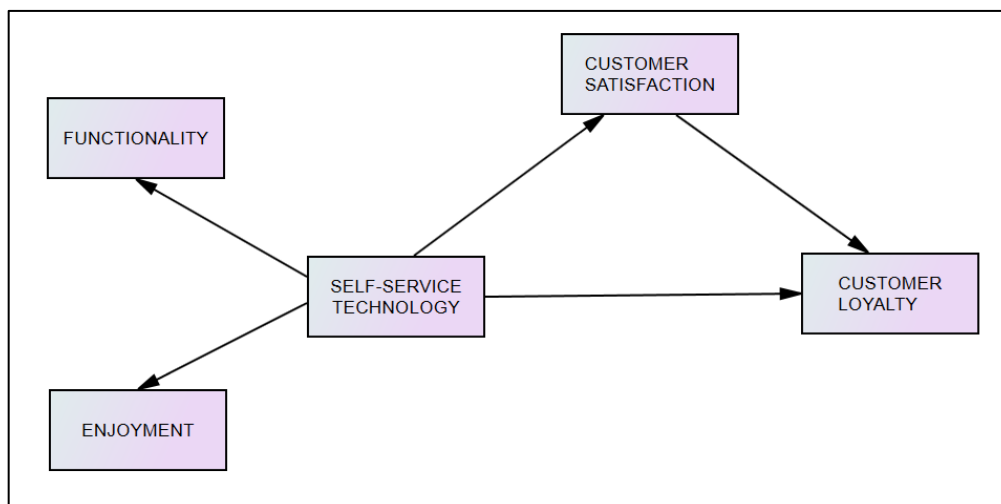


Figure 2: Proposed Research Model

CONCLUSION

Those decision-makers in the transportation industry who seek to enhance their services for customers have a plethora of approaches such as decreasing the service fee, increasing the security of an application to avoid scammers, making different design to match the different attributes of the customer and so forth. However, to provide a foundation for further research, functionality and enjoyment are consolidated as SST measures and its effect on customer satisfaction and loyalty were proposed. Although the initial measure of SST consisted of seven dimensions, functionality and enjoyment seemed more pronounced in transportation research as it critically addressed the ability of the system and attractiveness of the SST Services.

Like other previous studies, this is not without its limitations. First, this research is still under the developing process which means the future result may not compatible with the proposed framework. Second, this paper applies the minimum approach to propose the research model. To date, there is novel literature has been introduced that is a scientific literature review in 2010. In addition, the systematic literature review and meta-analysis should be considered in the future. In terms of the analysis, quantitative analysis much preferable for estimating all effects simultaneously.

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AUTHORS CONTRIBUTION

Nur Dalila Mukhtar wrote the literature reviews; Asyraf Afthanorhan wrote the problem statement and methodology; Puspa Liza Ghazali checked the relevancy of the citation in the text, and Hazimi Foziah focused on technical parts based journal format.

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