Understanding the Relationship Between Service Quality and Technology Acceptance Factors

Wasun Khan-am[1], Krititya Rangsom[2]

[1]dept. of Information Systems
Faculty of Business Administration, RMUTT
Pathum thani, Thailand
e-mail: wasun_k@rmutt.ac.th
[2]dept. of Information Systems
Faculty of Business Administration, RMUTT
Pathum thani, Thailand
e-mail: gritiya_r@rmutt.ac.th

Abstract—Service quality plays a pivotal role in shaping consumer preferences and decisions regarding various products and services. This study aims to investigate internal variables such as attitudes, ease of use perception, perceived benefits, and E-S-QUAL, and analyze their relationships. The research tool utilized in this study is built upon the Technology Acceptance Model and E-S-Qual. The study focused on internet users residing in Bangkok and its suburbs or those working in the same area, with a sample size of 182 participants. Data collection took place at various transportation service points. Statistical analysis included reliability analysis, correlation analysis, and multiple regression analysis. The research findings highlight that attitude can be predicted by efficiency and system availability factors. Similarly, the perceived ease of use can be predicted by efficiency, fulfillment, and privacy factors. Additionally, perceived usefulness exhibit predictability, closely linked to efficiency and privacy factors. Notably, E-S-QUAL factors demonstrate a positive correlation with attitude, perceived ease of use, and perceived usefulness, indicating their potential relevance in future technology acceptance models

Keywords; Service Quality; TAM; E-S-QUAL; Website Evaluation

I. INTRODUCTION

A. Background

In today's commerce landscape, beyond the traditional brick-and-mortar retail, online commerce, commonly known as E-commerce, has emerged as a highly popular avenue for consumers. E-commerce represents a diverse spectrum of online commercial activities that have gained immense popularity among regular internet users. Presently, E-commerce operations take various forms, employing different platforms and approaches.

The fundamental platform for online commerce is the E-commerce website. These websites serve as online storefronts, resembling traditional physical shops or malls. However, the convenience and accessibility they offer have made them immensely popular. Subsequently, mobile commerce, or M-commerce, has evolved, where businesses operate through mobile applications, further diversifying the ways products are sold and enhancing the overall user experience.

Designing E-commerce websites and mobile commerce apps has become pivotal in attracting visitors and potential customers. It is these platforms that serve as the virtual gateway for customers to explore and ultimately make purchasing decisions. They offer an array of features, from product browsing to secure payment options, creating a seamless shopping experience.

In providing E-commerce services, understanding the quality of service is crucial. Service providers need to gauge how well their services meet customer needs and expectations. Researchers in the field of service quality have developed metrics and tools to assess the quality of E-commerce services. This research seeks to establish the relationship between these service quality indicators and existing theories and models.

B. Objective

1. To assess the levels of internal variables and the quality of service in electronic commerce (E-commerce).
2. To analyze the degree of correlation between the quality of service in E-commerce and internal variables

C. *Frameworke*

From the Technology Acceptance Model and the service quality metrics for E-commerce websites, we formulate the following operational framework:

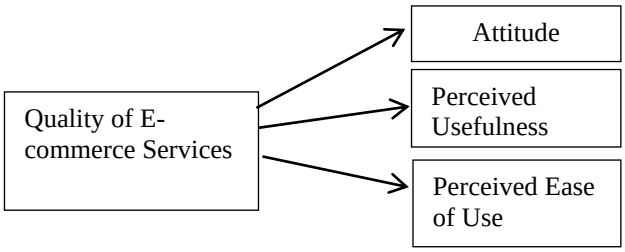

Figure 1. Research Framework

D. *Hypothese*

H1: The quality of service in electronic commerce is positively correlated with attitudes towards using electronic commerce.

H2: The quality of service in electronic commerce is positively correlated with perceived benefits of using electronic commerce.

H3: The quality of service in electronic commerce is positively correlated with the perceived ease of use of electronic commerce.

II. LITERATURE REVIEW

A. *The Technology Acceptance Model [1-4]*

The Technology Acceptance Model (TAM) has emerged as a cornerstone in understanding the complex dynamics of user acceptance of technology. Developed by Fred Davis in the late 1980s, TAM offers a straightforward yet powerful framework for assessing how individuals perceive and decide to use technology. Over the years, TAM has been widely adopted and adapted, becoming a pivotal tool in various fields, including information systems, marketing, and user experience design.

TAM posits two fundamental constructs: perceived ease of use (PEOU) and perceived usefulness (PU). PEOU reflects the extent to which users believe that a particular technology will be effortless to use, while PU assesses the degree to which users perceive that technology as beneficial in achieving their goals. These constructs have proven remarkably robust in predicting user intentions and behavior.

One of the primary strengths of TAM lies in its simplicity and ease of application. Its parsimonious nature has made it accessible to researchers, businesses, and policymakers alike. By focusing on user-centered factors, TAM helps elucidate the driving forces behind technology adoption and guides strategies to enhance user acceptance.

However, TAM's adaptability has been one of its most compelling features. Researchers have extended and augmented the model to address nuanced contexts and explore additional factors. These extensions have enriched our understanding of the complexities surrounding technology acceptance. Variables like trust, social influence, and personal innovativeness have been integrated to provide a more comprehensive perspective on user behavior.

Furthermore, TAM's enduring relevance can be attributed to its ability to adapt to contemporary technological trends. As new technologies emerge and reshape our digital landscape, TAM continues to provide valuable insights. From the adoption of smartphones and mobile apps to the integration of artificial intelligence and the Internet of Things, TAM has remained a vital tool for researchers and practitioners seeking to understand and optimize user experiences.

B. *E-S-QUAL [5-11]*

The E-S-QUAL (Electronic Service Quality) model is a comprehensive framework for assessing the quality of electronic services. It was developed by Parasuraman, Zeithaml, and Malhotra in their research. The model consists of seven dimensions, each of which represents a critical aspect of electronic service quality:

- Efficiency: This dimension focuses on how efficiently users can accomplish their tasks or goals when using electronic services. It measures factors such as speed, ease of use, and the ability to complete transactions quickly.
- System Availability: This dimension assesses the reliability and accessibility of the electronic service system. It examines factors like system uptime, server reliability, and the absence of technical glitches that might disrupt service availability.
- Fulfillment: Fulfillment refers to how well the electronic service meets users' needs and expectations. It evaluates whether the service delivers what it promises and whether it effectively fulfills user requirements.
- Privacy: Privacy is a critical concern in the digital age. This dimension evaluates the extent to which users' personal information and data are protected when interacting with electronic services. It includes factors such as data security, confidentiality, and privacy policies.
- Responsiveness: Responsiveness assesses how quickly and effectively the service provider addresses user inquiries, requests, or issues. It measures the timeliness and effectiveness of customer support and communication channels.
- Assurance: Assurance focuses on building trust and confidence in users by evaluating the credibility and expertise of the service provider. It includes factors such as clear communication, competence, and trustworthiness.
- Empathy: Empathy relates to the provider's ability to understand and consider the unique needs and

preferences of individual users. It measures how well the service provider can personalize the service experience and offer personalized support.

These seven dimensions together provide a holistic view of the quality of electronic services. They help organizations identify areas of improvement, enhance user satisfaction, and build trust and loyalty among their online customers. Researchers and businesses can use the E-S-QUAL model to assess and enhance the quality of electronic services, ultimately leading to better user experiences and competitive advantages in the digital marketplace.

While the E-S-QUAL model comprises seven dimensions, this research exclusively focuses on evaluating the website component. Within this segment, four key dimensions are considered: Efficiency, System Availability, Fulfillment, and Privacy.

III. RESEARCH METHODOLOGY

A. Populations and Sample

The population comprises individuals in the Generation Z age group who use the internet and either reside within the Bangkok metropolitan area and its suburbs or work in this same metropolitan area.

The sample group was selected using a random sampling method with a specific focus on individuals who have engaged in online commerce activities. The sample size was determined by calculating fifteen times the number of variables of interest. In this study, there are seven variables of interest, resulting in a desired sample size of 105 participants.

B. Instrumens

This research is an exploratory study that utilizes a self-developed questionnaire based on the E-S-Qual framework and a technology acceptance model, divided into two parts:

The first part measures the quality of service in electronic commerce, consisting of 8 items for efficiency, 4 items for system, 7 items for fulfillment of needs, and 3 items for privacy, totaling 22 items. The measurement is conducted using a 5-level Likert scale.

The second part assesses factors influencing technology acceptance, which includes 4 items for perceived ease of use, 4 items for perceived benefits, and 2 items for attitudes towards electronic commerce. The measurement is also conducted using a 5-level Likert scale.

C. Data Administration

Data was collected using a convenience sampling method and a survey with leading questions, with a sample size of 182. Collection took place at transportation hubs and traffic junctions to ensure COVID-19 safety. The data collection process spanned three months, from April to June 2021.

D. Statistics for Analyze

- Statistics used to test the reliability of the questionnaire: The questionnaire utilized Cronbach's Alpha as a measure of reliability, with a passing criterion set at 0.7 or higher.
- Reliability analysis: Used to assess the suitability of combining observable variables. Passing criteria set at 0.7 or higher.
- Correlation analysis: Applied to examine fundamental relationships.
- Multiple linear regression analysis: Employed to investigate causal factors and relationships.

IV. RESULT

A. Reliability Analysis

Before commencing data analysis, a reliability test was conducted to ensure the suitability of the data for subsequent analysis. This was done to ensure confidence in the appropriateness of the data for further analytical procedures.

TABLE I. RELIABILTY TEST RESULT

Variable	N	Alpha's Value
Attribute	2	.876
Perceived of Useful	4	.935
Perceived Ease of Use	4	.938
Efficiency	8	.969
System	4	.939
Fulfillment	7	.969
Privacy	3	.939

In table I, these variables represent different aspects or dimensions being studied, and the Cronbach's Alpha values suggest the internal consistency or reliability of the measurements for each variable. Higher Cronbach's Alpha values typically indicate greater reliability. In this case, all variables have relatively high Cronbach's Alpha values, suggesting that the measurements for each variable are reliable and consistent.

B. Correlation Test

The results of the reliability analysis found that the dependent variables and factors were appropriate for use in the next analysis. Therefore, a correlation test of the dependent variables and factors was performed to identified the relationship initially. The result of this test show follow:

TABLE II. CORRELATION TEST RESULT

Variable	Mean	SD.	4	5	6	7
1.Attribute	3.728	1.019	.865**	.835**	.826**	.775**
2. Perceived of Useful	3,847	.951	.887**	.858**	.855**	.843**
3. Perceived Ease of Use	3.808	.966	.901**	.856**	.883**	.858**
4. Efficiency	3.800	.959				
5. System	3.734	.986				
6. Fulfillment	3.784	.945				
7.Privacy	3.782	1.015				

** p< .01

The table II also suggests that there are correlations between these variables. The correlation coefficients are all positive and statistically significant at the 0.01 level, indicating a strong positive relationship between these variables.

C. Regression Analysis

Based on the results of the correlation analysis, it was observed that there were significant relationships between the dependent variables and the factors. This makes it appropriate to proceed with a multiple regression analysis. Consequently, such an analysis was conducted.

TABLE III. RESGRESSION ANALYSIS FOR ATTIUDE

Variable	B	95% CI	β	*t*	*p*
Constant	.207	[-.097, .511]		1.346	.180
Efficiency	.686	[.482, .890]	.646	6.628	.000
System	.245	[.046, .444]	.237	2.433	.016

Remark R^2_{adj} =.754 (N=182, p = .000), F(2,179) = 278.177,
CI = confidence interval for *B*

The regression analysis explores the relationships between the independent variables and the dependent variable. The constant term has a coefficient of 0.207 with a wide 95% confidence interval [-0.097, 0.511], suggesting a weak effect on the dependent variable. Efficiency emerges as a significant predictor, demonstrating a substantial impact with a coefficient of 0.686 and a very low p-value of 0.000, indicating high statistical significance. System also exhibits a significant influence with a coefficient of 0.245 and a p-value of 0.016. The adjusted R-squared (R2adj) for this model is 0.754, indicating a relatively high proportion of variance explained. The overall model is statistically significant (F(2,179) = 278.177, p = 0.000), providing strong evidence for the relationships observed. The 95% confidence intervals for the coefficients add robustness to these findings, supporting the connections between the variables and the dependent variable.

TABLE IV. RESGRESSION ANALYSIS FOR PERCEIVE EASE OF USE

Variable	B	95% CI	β	*t*	*p*
Constant	.237	[-.005, .479]		1.935	.055
Efficiency	.544	[.387, .700]	.540	6.865	.000
Fulfillment	.233	[.040, .427]	.228	2.377	.019
Privacy	.165	[.015, .314]	.173	2.172	.031

REMARK: R^2_{adj} =.834 (N=182,p = .000),
F(3,178) = 303.380,
CI = confidence interval for *B*

The regression analysis reveals the relationships between the independent variables and the perceived ease of use and fulfillment of quality. The constant term exhibits a moderate effect, with a coefficient of 0.237 and a p-value of 0.055, suggesting a marginal impact on perceived ease. Efficiency stands out as a robust predictor, displaying a substantial influence with a coefficient of 0.544 and an extremely significant p-value of 0.000. Fulfillment also exhibits a noteworthy impact, with a coefficient of 0.233 and a significant p-value of 0.019. Privacy, while still influential, has a smaller effect size with a coefficient of 0.165 and a significant p-value of 0.031. The model's adjusted R-squared (R2adj) is 0.834, indicating a high proportion of variance explained. The overall model is highly significant (F(3,178) = 303.380, p = 0.000), providing strong evidence for the relationships observed. The 95% confidence intervals for the coefficients enhance the robustness of these findings, confirming the relationships between the variables and perceived ease and fulfillment of quality.

TABLE V. RESGRESSION ANALYSIS FOR PERCEIVED OF USEFULNESS

Variable	B	95% CI	β	*t*	*p*
Constant	.442	[.186, .698]		3.780	.001
Efficiency	.636	[.500, .772]	.642	9.227	.000
Privacy	.261	[.132, .390]	.279	4.005	.000

Remark: R^2_{adj} =.802 (N=182,p = .000),
F(2,179) = 366.645,
CI = confidence interval for *B*

In table 5, we observe the coefficients and statistical significance of various variables concerning the dependent variable. The constant term, with a coefficient of 0.442 and a p-value of 0.001, indicates a highly significant impact on the dependent variable. Efficiency is a crucial predictor, displaying a substantial influence with a coefficient of 0.636 and an extremely significant p-value of 0.000. Similarly, Privacy also demonstrates a notable association, with a coefficient of 0.261 and a significant p-value of 0.000. The model's adjusted R-squared (R2adj) is 0.802, indicating that it explains a substantial proportion of the variance. The overall model is highly significant (F(2,179) = 366.645, p = 0.000), providing strong evidence for the relationships observed. The 95%

confidence intervals for the coefficients further enhance the credibility of these findings.

V. Conclusion and Discussion

A. Summary

In the presented regression analyses, we investigate the connections between various independent variables and their influence on the dependent variable. The constant term appears to have a relatively modest effect on the dependent variable, with a coefficient of 0.207 and a p-value of 0.180, suggesting a limited impact. On the other hand, Efficiency emerges as a substantial and highly significant predictor, with a coefficient of 0.686 and a remarkably low p-value of 0.000, indicating its strong influence. Additionally, the System variable exhibits a significant impact, with a coefficient of 0.245 and a p-value of 0.016. The model's adjusted R-squared (R2adj) of 0.754 signifies a substantial proportion of explained variance. Furthermore, the overall model demonstrates high statistical significance ($F(2,179) = 278.177$, $p = 0.000$), providing robust evidence for the observed relationships. The inclusion of 95% confidence intervals for the coefficients reinforces the validity of these findings, confirming the associations between the variables and the dependent variable. The E-S-QUAL variable is suitable as an external variable in the TAM model.

B. Discussion

There are three regression tests provided offer insights into the relationships between independent variables and their impact on dependent variables. Let's discuss each of them separately:

In the first regression test, the regression analysis explores the impact of independent variables on the dependent variable. The constant term has a relatively weak effect, suggesting a marginal influence on the dependent variable. However, Efficiency and System emerge as significant predictors. Efficiency has a strong impact, indicating that it plays a vital role in explaining the variation in the dependent variable. The adjusted R-squared (R2adj) value is 0.754, indicating that the model explains a significant portion of the variance. Overall, the model is statistically significant, providing strong evidence for the observed relationships.

In the second regression analysis investigates the influence of independent variables on perceived ease of use and fulfillment of quality. The constant term has a moderate effect on perceived ease, while Efficiency stands out as a robust predictor with a substantial impact. Fulfillment also shows a noteworthy impact. Privacy, though influential, has a smaller effect size. The adjusted R-squared (R2adj) is relatively high at 0.834, indicating that the model explains a substantial proportion of the variance. The overall model is highly significant, confirming the relationships observed.

In the third regression, we observe the coefficients and significance of various variables concerning the dependent variable. The constant term has a highly significant impact on the dependent variable. Efficiency and Privacy are crucial predictors with substantial and highly significant influences. The adjusted R-squared (R2adj) value of 0.802 indicates that the model explains a significant portion of the variance. The overall model is highly significant, providing strong evidence for the observed relationships.

In summary, these regression analyses reveal the importance of Efficiency, System, Fulfillment, and Privacy as predictors of various dependent variables. They highlight the significance of these variables in explaining variances and provide valuable insights into the relationships within the studied models. These findings can be instrumental in understanding and improving the factors affecting the dependent variables under investigation.

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