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## Attitudes, Security, and Perceived Ease of Use Influence The Consumers' Decision to Use An E- payment System

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### Abstract

This study aims to verify a complete model of customers' intention to utilise an electronic payment system (EPS). It employs the Technology Acceptance Model (TAM) with constructs of efficiency, convenience, security, trust, and traceability. Structural equation modelling (SEM) is employed to build a prediction model of attitudes toward the EPS. Individuals' attitudes and intentions to use EPS, which merges card, internet, and mobile banking, were gathered and evaluated using several criteria modified from TAM via web-based online survey questions. According to the findings, customers' attitudes, security, and perceived utility are significant antecedents to their propensity to use EPS. Furthermore, the mediation study reveals that perceived ease of use mediates the relationship between efficiency and perceived usefulness. As a result, the findings imply that while building EPS to promote customers' desire to use cards, the internet and mobile banking must consider factors such as attitude, security, and perceived ease of use.

**Keywords:** Attitudes, Security, Perceived Ease of Use, Consumer Decision, E-payment System

### Introduction

The current era of technological advancement has rapidly increased the number of internet users. Predictably, the revolution in Information and Communication Technology (ICT) has given rooms to electronic-based systems, commonly known as 'e'. The increasing number of internet users and the ICT revolution have caused the Electronic Commerce (EC) system which uses the internet platform, to play significant roles in today's economic and commercial activities.

EC is built upon E-Payment Systems (EPS) and has become a major component of business operations for many companies. Besides, e-payment has become one of the most critical issues for successful businesses and financial services (Soegoto and Tampubolon, 2020; Zhang, 2020; Kousaridas et al., 2008; Kim et al., 2010). In the comparison to the traditional payment methods, e-payment techniques have several favorable characteristics, including security, reliability, scalability, anonymity, acceptability, privacy, efficiency, trust, traceability, convenience and accessibility (Almasri, 2019; Soegoto and Tampubolon, 2020; Tella and Abdulmumin, 2015).

This research uses Malaysia as the site for the empirical investigation because a supporting infrastructure is required for the EPS development. Malaysia has aggressively pursued the development of IT and network, and has created a world-class IT infrastructure. Recent statistics indicate that consumers in Malaysia have adopted the e-payment system and undeniably, the EPS has been the major reason for the abandonment of the old business transaction method. Thus, many researchers have attempted to develop a model capable of identifying the contributing factors of EPS prevalence. Some of the important models have been developed, ranging from e-learning (Fathema et al., 2015; Dietrich et al., 2020), e-payment (Chavosh et al., 2011; Tella and Olasina, 2016; Pei et al., 2016; Tella and Abdulmumin, 2015; Lai and Zainal, 2015; Lai, 2016; Shukur and Hasan, 2020), and e-wallet (Amoroso and Magnier-Watanabe, 2012; Amin et al., 2015). However, this study focuses on the consumers' intention that is measurable by the Technology Acceptance Model (TAM) (Davis et al., 1989) and to explore the possibility of integrating EPS with convenience, efficiency, trust, security, and traceability.

Therefore, this study aims to investigate the relationship between convenience, efficiency, trust, security, traceability, perceived ease of use, perceived usefulness, and attitude towards consumers' intention and the utilization of EPS that integrates cards, the internet, and mobile banking. The sub objectives are:

1. To investigate the effect of convenience and efficiency toward perceived usefulness of EPS.
2. To investigate the effect of convenience and efficiency toward perceived ease of use of EPS.
3. To investigate the effect of perceived ease of use toward perceived usefulness and attitude of EPS.
4. To investigate the effect of perceived usefulness toward intention to use EPS.
5. To investigate the effect of perceived usefulness, attitude, trust, security, and traceability toward intention to use EPS.

## **Theoretical Background**

### **Electronic Payment System (EPS)**

E-Payment Services in electronic commerce have been used as a model for cash-based payment instruments and on-account accounts. Simultaneously, new intermediaries such as PayPal succeeded in fulfilling the new needs of online merchants and consumers.

E-Payment System (EPS) is defined as a subset of e-commerce transactions that uses electronic-based system (Junaidi and Sfenrianto, 2015). Buying and selling goods or offering services through the internet are also defined as e-commerce in which the process of payment is paperless (Tella and Abdulmumin, 2015). In other words, it is a digital payment system between two entities as compensation or consideration for the receipt of goods or services

(Tella and Olasina, 2014). In Malaysia, like many other countries, the convenience of using EPS is gaining popularity amongst vendors and consumers.

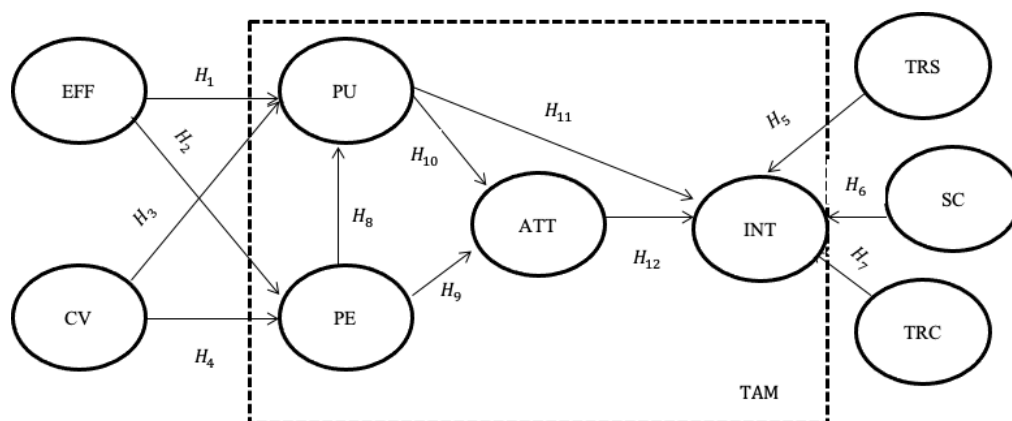
### Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) (Davis, 1989) is generated from the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), offering a theoretical basis to track the behavior of consumer acceptance of information technology. There are two core beliefs in TAM – perceived usefulness and perceived ease of use – that influence an individual’s behavioral intention to adopt a system. Davis (1989) defined perceived usefulness as “the degree to which an individual believes that using a particular system would enhance his or her productivity”, while perceived ease of use as “the degree an individual believes that using a particular system would be free of effort”. Perceived ease of use is deemed to have a direct effect on both perceived usefulness and attitudes towards using a technology (Davis, 1989). Davis (1989) suggested that users' belief is directly related to technology's usefulness, the attitude, and the intention to use a technology. It is also reported that perceived usefulness has a stronger relationship with the intention to use compared to other variables.

### Research Model and Hypotheses

#### Research Model

This study tests the research model of consumers’ intention to use EPS, which is influenced by consumers’ perception efficiency, convenience, trust, security, and traceability. For efficiency and convenience, these two factors are important concerns for consumers during e-payment transactions. In this case, both factors are correlated with perceived ease of use and perceived usefulness, which is to test the propositions and demonstrate a significant, positive relationship between consumers' intention of convenience and efficiency. Besides, security, trust, and traceability are correlated with consumers’ intention to use EPS. Therefore, in this study, it integrated the consumers’ convenience, efficiency, security, trust, and traceability into the research model by assuming that all the factors are important concerns for consumers during an e-payment transaction. The detail of the research model could be seen in Figure 1.



Note: CV = Convenience, TRS = Trust, SC = Security, TRC = Traceability, EFF = Efficiency, PU = Perceived Usefulness, PE = Perceived Ease of Use, ATT = Attitude, INT = Intention to use

**Figure 1:** Proposed research model for EPS

### Research Hypotheses

In general, the proposed research model is to provide a better understanding of the E-Payment System (EPS) exploration (see Figure 2). Efficiency and convenience are incorporated as external variables, while trust, security, and traceability are the extension of the original Technology Acceptance Model (TAM) (Davis et al., 1989). The following hypotheses are proposed:

H1: The efficiency of EPS has a positive influence on perceived usefulness

H2: The efficiency of EPS has a positive influence on perceived ease of use

H3: The convenience of EPS has a positive influence on perceived usefulness

H4: The convenience of EPS has a positive influence on perceived ease of use

H5: Trust has a positive influence on the consumers' intention to use EPS

H6: Security has a positive influence on consumers' intention to use EPS

H7: Traceability has a positive influence on consumers' intention to use EPS

H8: Perceived ease of use of EPS has a positive and significant effect on perceived usefulness

H9: Perceived ease of use of EPS has a positive and significant effect on attitude toward behavior

H10: Perceived usefulness of EPS has a positive and significant effect on attitude toward behavior

H11: Perceived usefulness has a positive and significant effect on consumers' intention to use EPS

H12: Attitude has a positive and significant effect on consumers' intention to use EPS

### Analysis and Results

A structured web-based questionnaire was used in this survey to evaluate the proposed model and to validate the proposed set of interrelationships that were associated with consumers' intention to use EPS of efficiency, convenience, trust, security, and traceability. The survey was conducted using 33- items. The questionnaire was structured into two sections. In the first section, it contained the user's socio-demographic information as well as the rest of the information to analyze the profile of the participants, their classification, and the analysis of the relevant variables. The second section grouped the items for the constructs of the consumers' intention to use a model to be obtained, and was also the main part of the research. The questionnaire and the scale used a five-point Likert scale from strongly disagree (1) to strongly agree (5).

A web-based survey questionnaire was distributed within a one-month period using social media like *Facebook*, *Line*, and *WhatsApp*. Altogether, a total of 880 respondents participated in the online survey. 119 respondents were eliminated due to invalid answers or the lack of experience in using EPS – leaving 761 respondents for the empirical analysis (a response rate of 13.5%). A screening questionnaire was used to determine whether the user has any experience with EPS or not. The respondents were asked to provide factors that influence consumers' intention to use EPS. The results of demographic respondents are represented in Table 1.

**Table 1:** The respondents' demographic information

Measure	Item	Frequency	Percentage (%)
Gender	Male	150	19.7
	Female	611	80.3
Age	Less than 25	48	6.3
	25 - 35	484	63.6
	36 - 45	185	24.3
	46 - 55	36	4.7
	Above 55	8	1.1
Race	Malay	696	91.5
	Chinese	31	4.1
	India	18	2.4
	Others	16	2.1
Marital Status	Single	278	36.5
	Married	483	63.5
Education	High school or below	17	2.2
	Diploma	34	4.5
	Bachelor Degree	134	17.6
	Master Degree	443	58.2
	Doctorate	133	17.5
Income	Less than RM1, 000	98	12.9
	RM1, 001 – RM3, 000	196	25.8
	RM3, 001 – RM5, 000	214	28.1
	More than RM5, 001	253	33.2
Experience using EPS	Yes	732	96.2
	No	29	3.8

Based on Table 1, it was found that the females (80.3%) are more influenced to use EPS compared to males (19.7%), and the majority of them aged 25 – 35 years old. Furthermore, most of the consumers have Master's Degree (58.2%) with income of more than RM 5,001 (33.2%) and the majority of them have had experience of using EPS (96.2%).

In this study, the research model was analyzed using structural equation modeling (SEM), supported by Analysis of Moment Software (AMOS). SEM can estimate a series of separate but interdependent multiple regression equations, simultaneously. It consists of several statistical techniques that can be used in various theoretical models. Model estimation was performed using maximum likelihood approach. Data analysis proceeded in two stages: the measurement model and structural model.

### Measurement Model Analysis

The analysis for the measurement model would provide a confirmatory assessment of reliability, convergent validity, and discriminant validity (Anderson and Gerbing, 1988). At this stage, all the confirmatory assessments were analyzed using AMOS software. The results are shown in Table 2 below.



**Table 2:** Reliability test

Construct	Cronbach's alpha
Intention (INT)	0.931
P. Usefulness (PU)	0.890
P. Ease of Use (PE)	0.915
Efficiency (EFF)	0.775
Attitude (ATT)	0.840
Security (SC)	0.859
Trust (TRS)	0.900

For the reliability test in Table 2, the result shows that the Cronbach's alpha values range from 0.775 (EFF) to 0.931 (INT). All values meet the requirement since Cronbach's alpha is greater than 0.7 (Nunnally, 1978).

**Table 3:** The convergent and discriminant validity test

	CR > 0.6	AVE > 0.5	INT	PU	PE	EFF	ATT	SC	TRS
INT	0.911	0.797	<b>0.893</b>						
PU	0.880	0.786	0.635	<b>0.886</b>					
PE	0.912	0.675	0.693	0.719	<b>0.822</b>				
EFF	0.780	0.645	0.745	0.679	0.743	<b>0.803</b>			
ATT	0.798	0.568	0.848	0.679	0.836	0.786	<b>0.754</b>		
SC	0.871	0.630	0.578	0.407	0.583	0.605	0.605	<b>0.794</b>	
TRS	0.903	0.704	0.530	0.423	0.546	0.538	0.538	0.843	<b>0.840</b>

Note: CV = Convenience, TRS = Trust, SC = Security, TRC = Traceability, EFF = Efficiency, PU = Perceived Usefulness, PE = Perceived Ease of Use, ATT = Attitude, INT = Intention

Based on the final results for convergent validity, the Composite Reliability (CR) meets the requirement since all the constructs are more than 0.6 (Awang, 2015). However, the convergent validity could also examine the value of average variance extracted (AVE), whereby the AVE results show that all of the constructs meet the requirement since AVE is more than 0.5. Thus, it can be concluded that CR and AVE are acceptable in the model.

Another measurement that needs to be assessed was the discriminant validity. As seen in Table 4, all the square roots of AVE were larger than their corresponding coefficients of correlation with other factors. This indicates that all of the constructs met the discriminant validity test. From these results, it can be concluded that these analyses have met both convergent and discriminant validity.

### Structural Model Analysis

After analyzing the reliability and validity of the initial measurement scales, the research hypotheses were tested using Structural Equation Modeling (SEM). There were several fitness indexes that reflect how fit was the model to the data. Hair et al., (1998) and Holmes-Smith (2006) recommended the use of at least one fitness index from each category of model fit, namely Absolute Fit, Incremental Fit, and Parsimonious Fit.

**Table 4:** Fitness Indices

Model	$\chi^2$	Df	RMSEA	GFI	AGFI	CFI	TLI	NFI
Hypothesized	600.130	216	0.050	0.929	0.909	0.971	0.965	0.955

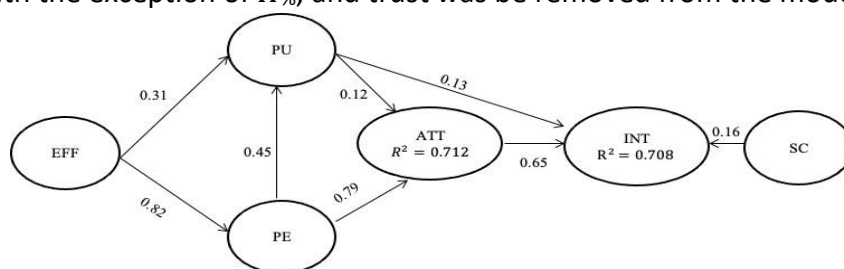
The result of fitness indices in Table 4 shows that GFI, AGFI, CFI, TLI, and NFI exceeded 0.90, the RMSEA is 0.050, and the value of chi-square statistics of the model is 600.130 with 216 degrees of freedom. The results imply that the model is a perfect fit to the model since the chi-square/df is less than 3.00. Therefore, all the values of fitness indexes achieved the required level.

The hypotheses-testing was analyzed using AMOS method. The result provides the analyses on hypotheses and constructs' relationship based on the examination of standardized paths. The results are displayed in Table 5 and Figure 2.

**Table 5:** Hypotheses-testing results

Hypotheses	Paths directions	Estimate	P-value	Decision
H1	<i>EFF</i> → <i>PU</i>	0.301	0.000***	Supported
H2	<i>EFF</i> → <i>PE</i>	0.782	0.000***	Supported
H3	<i>TRS</i> → <i>INT</i>	0.019	0.736 <sup>NS</sup>	Not Supported
H4	<i>SC</i> → <i>INT</i>	0.160	0.008**	Supported
H5	<i>PE</i> → <i>PU</i>	0.483	0.000***	Supported
H6	<i>PE</i> → <i>ATT</i>	0.711	0.000***	Supported
H7	<i>PU</i> → <i>ATT</i>	0.172	0.000***	Supported
H8	<i>PU</i> → <i>INT</i>	0.127	0.004**	Supported
H9	<i>ATT</i> → <i>INT</i>	0.647	0.000***	Supported

The outcomes of the hypotheses-testing are listed in Table 6. Eight hypotheses were supported, and one was unsupported. Meanwhile, two hypotheses were deleted from the model. The results showed that efficiency and perceived ease of use support the proposed model. The results also demonstrated that efficiency exerts a great effect on the relation factors, with path coefficient 0.782 and 0.301 on perceived ease of use and perceived usefulness, respectively. Security has a positive influence and a significant impact on consumers' intention to use EPS, with path coefficient 0.160, whereas the relationship between trust and intention to use EPS is not significant. Therefore, all hypotheses were supported with the exception of *H<sub>3</sub>*, and trust was be removed from the model.



Note: CV = Convenience, TRS = Trust, SC = Security, TRC = Traceability, EFF = Efficiency, PU = Perceived Usefulness, PE = Perceived Ease of Use, ATT = Attitude, INT = Intention

**Figure 2:** The structural model



The coefficient of determination  $R^2$  indicates that 70.8% of the total variance of the consumers' intention to use EPS can be explained by efficiency, perceived ease of use, perceived usefulness, attitude, and security in TAM. Another 29.2% can be explained by other factors. Meanwhile, 71.2% of the total variance of the consumers' attitude can be explained by efficiency, perceived usefulness, and perceived ease of use. A path analysis was also performed to test all the hypotheses that were specified before. Table 6 shows that all hypotheses are supported with p-values being less than 0.05, excluding trust to intention to use EPS that was not supported ( $0.736 > 0.05$ ). Therefore, in the final structural model, trust was removed from the model.

### Discussion

Efficiency has a positive and significant effect on perceived ease of use and perceived usefulness. It also has a positive and direct relationship with both perceived ease of use and perceived usefulness. The difference between efficiency significant relationship with perceived ease of use ( $\beta = 0.816$ ) and perceived usefulness ( $\beta = 0.308$ ) indicates that efficiency contributes more towards perceived ease of use compared to perceived usefulness, with path coefficient difference of 0.508. Therefore, efficiency is an important factor to deliver both perceived ease of use and perceived usefulness in EPS.

The results of Structural Equation Modeling (SEM) established that there is a positive influence on consumers' intention to use EPS based on hypothesis 6, which was supported by the research data ( $\beta=0.165$ ,  $p\leq 0.001$ ). It can be suggested that the higher the security of using EPS, the higher the consumers' intention to use EPS. This hypothesis was validated and concluded in previous studies by Lai (2016) and Shin (2009), in which security was positively associated with consumers' intention to use EPS. Thus, hypothesis 6 for consumers' intention to use EPS is confirmed. This result further implied that security is an important element of consumers' intention to use EPS, but it is also a major concern. However, the result of standardized regression weight considered security as a medium size with 16.5%. Based on the findings of consumers' perceived security, the management of an organization should implement security tools such as extra security code for EPS. To improve the perception of security, the management should run a campaign on how to safeguard their e-payment transaction with additional security and privacy features. Furthermore, by increasing the security features, it will increase consumers' trust and confidence, which will lead to the intention to use EPS.

The findings of direct effect suggested that attitude is the most important aspect in consumers' intention to use EPS. However, the indirect effect results revealed perceived ease has an indirect effect towards consumers' intention to use EPS. Meanwhile, the mediation analysis shows that perceived ease of use has a mediating effect between efficiency and perceived usefulness.

### Managerial Implications

The coefficient of determination indicates that 70.8% of the total variance of the intention to use EPS is accountable by efficiency, perceived ease of use, perceived usefulness, attitude, and security. However, 71.2% of the variance of the intention to use EPS is explainable by efficiency, perceived ease of use, perceived usefulness, and attitude in the mediated model. To achieve optimum results, it is important for the management to understand the relative importance of various key factors that might affect the intention to use EPS.

Several researchers ignored and argued that attitude constructs in their studies have minor impacts on intention in most contexts (Davis, 1989). However, this current study found that attitude of the user towards e-payment service is the most influential factor that affects the consumers' intention to use EPS, as shown in Table 7. According to the results, attitude is positively related to consumers' intention to use EPS. This finding is in line with Davis (1989). Thus, this study's findings suggested that the management should focus their time and effort to change the attitude of prospective EPS users; for example, by using advertisements to inculcate a positive attitude towards EPS.

Additionally, consumer security is an essential element when deciding to adopt EPS. Consumers should be convinced that a proper mechanism is in place to protect their privacy and online transactions. It is imperative for the management to implement a mechanism such as safety protocol that augments consumer security. Nowadays, consumers are concerned about carrying a substantial amount of cash that exposes them to theft and losing money due to fraud transactions (Lai and Zainal, 2015; Kovács & David, 2016).

Perceived ease of use is another important factor that influences consumers' intention to use EPS (Venkatesh et al., 2003). Consumers are interested in practicality. However, the effect of perceived ease of use is often reduced after a short period of time. Therefore, the management should add values to consumers such as offering access to useful information. In addition, to enhance the effect of perceived ease of use, a significant effect on perceived usefulness is required so as not to discourage the consumers from using this system. Thus, a beneficial application will attract public attention and generate more consumers in the future.

### Limitation

This study has a few limitations; the data were collected using a web-based survey; making the target respondents to be confined to consumers with access to the internet and mobile data access. Also, the data were collected at one point of time and may have changed over time because of better EPS experiences and advancement. Furthermore, the data were only collected from Malaysian respondents only, and might not be relevant to other regions or countries. In addition, the measurement scales employed in this study were based on previous research and were fixed to analyze the factors that influence consumers' intention to use EPS. Future research should be extended to the non-internet and non-mobile users using the traditional survey method so that the information gathered may assist the management to target non-internet and non-mobile users. This study may be replicated in other regions as well, and use a longitudinal study to examine the consumers' intention to use EPS. Other than that, additional work is needed to further validate the scales and improve the reliability of TAM. Future work could also examine the possible moderation effects of age, gender, and personal innovativeness in predicting consumers' use and acceptance of EPS.

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