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SINGLE PLATFORM E-PAYMENT SYSTEM CONSUMERS' INTENTION TO USE

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ABSTRACT

This paper summarizes an explorative study of the various factors that contribute to consumers' adoption of an integrated, single platform payment system encompassing card, the internet and mobile technologies in the south east Asia context. The attempt to survey these areas in an integrated fashion is a novel approach that differs from existing studies that mainly focus on adoption factors of these technologies in isolation. The factors covered are design, convenience as well as enjoyment mediated by perceived usefulness, ease of use and the consumers' intention to use. The empirical results from the quantitative analysis suggest that design, convenience, enjoyment, perceived usefulness as well as perceived ease of use are significant factors that contribute to consumers' intention to utilize a single platform payment System. Organizations will be able to utilize the study information for developing products and services that meet the consumers' single platform E-payment system while also fulfilling their objective of corporate social responsibility.

Keywords: Consumers' Intention, TAM, Single Platform payment system, Card, Internet, Mobile

INTRODUCTION

Constant technological change simultaneously creates threats to established business models, while also offering opportunities for novel service offerings. Leading firms often seek to shape the evolution of technological applications to their own advantage [31, 21, 22, 50]. A recent trend is the development of integrated electronic payment systems in a manner that mirrors the convergence of various technological domains. Support for wide spread acceptance of such integrated payment systems can be found in studies [32, 12, 23] that indicate consumers enjoy using their phones for e-payment transactions as well as valuing the system design when it enhanced ease of use.

One possible approach concerning such integration is the combination card, internet and mobile into a single platform payment system. Such a payment system can be deployed to operate in numerous areas: for e.g. public transport payment, shopping, e-tickets, banking, healthcare and collection of loyalty points.

In the case of Malaysia, it's troublesome to top up the Touch N Go E-wallet mainly used for public transport with limited number of physical outlets for top-up, therefore the E-PaySIM™ combination allows the user to top-up the Touch N Go E-wallet even at 11pm through Internet banking for the LRT ride back home. There is a lack of empirical investigations combining the factors of the three E-payments (Card, Internet and Mobile) in one study which encourages the researcher to study the single platform E-Payment system known as "E-PaySIM™" since previous researches only focused on the three systems separately (Card, Internet, Mobile).

Marketing and information technology focus on factors such as convenience, good design and enjoyment in an attempt to offer better services to consumers [1, 8, 22, 27, 31]. Perceived ease of use and perceived usefulness are two important factors that contribute significantly

to consumers' intention to use a new platform or technology [9, 11, 17, 24, 26]. This study proceeds to investigate the relationship of factors such as convenience, design and enjoyment of the novelty of an integrated payment platform with perceived ease of use and perceived usefulness. There is also an investigation of the relationship between perceived ease of use, perceived usefulness and enjoyment with consumers' intention to use.

LITERATURE REVIEW

The TAM model [24, 28, 48, 51] is the most widely used framework for predicting information technology adoption [37, 28, 27, 24]. It has received much support [24, 29, 47, 48], particularly when focusing on the effects of perceptions of the technology's usefulness and convenience on adoption intentions [24, 29, 36] and is therefore ideally suited for use in this study. There have also been attempts [30, 23, 24, 29] to utilize TAM in analysing factors affecting adoption intentions beyond perceptions of convenience and usefulness, such as design and enjoyment factors. In our study, design is defined as the technical design and functionality of the single platform payment system.

TAM offers a practical approach to identifying the specific issues that make a particular technology or system acceptable or unacceptable, allowing appropriate redress as well as predictions for future acceptance of similar technologies. Although TAM has been tested widely with different samples in different situations and has proven its worth as a reliable model in detailing information technology acceptance and use [43, 24, 25, 10] many extensions to the TAM have also been proposed and tested (e.g. [46, 47, 35, 26, 24, 15, 19]).

This particular study adapts a particular version of TAM [10] which measures consumers' intention to use; and extends it by including enjoyment as an additional factor to study. This is motivated by the identification of enjoyment as having a direct relationship with intention to use online shopping [32, 23, 6]. The intent is to investigate the nature of the relationship between design, convenience and enjoyment in influencing consumers' intention to use a single platform payment system.

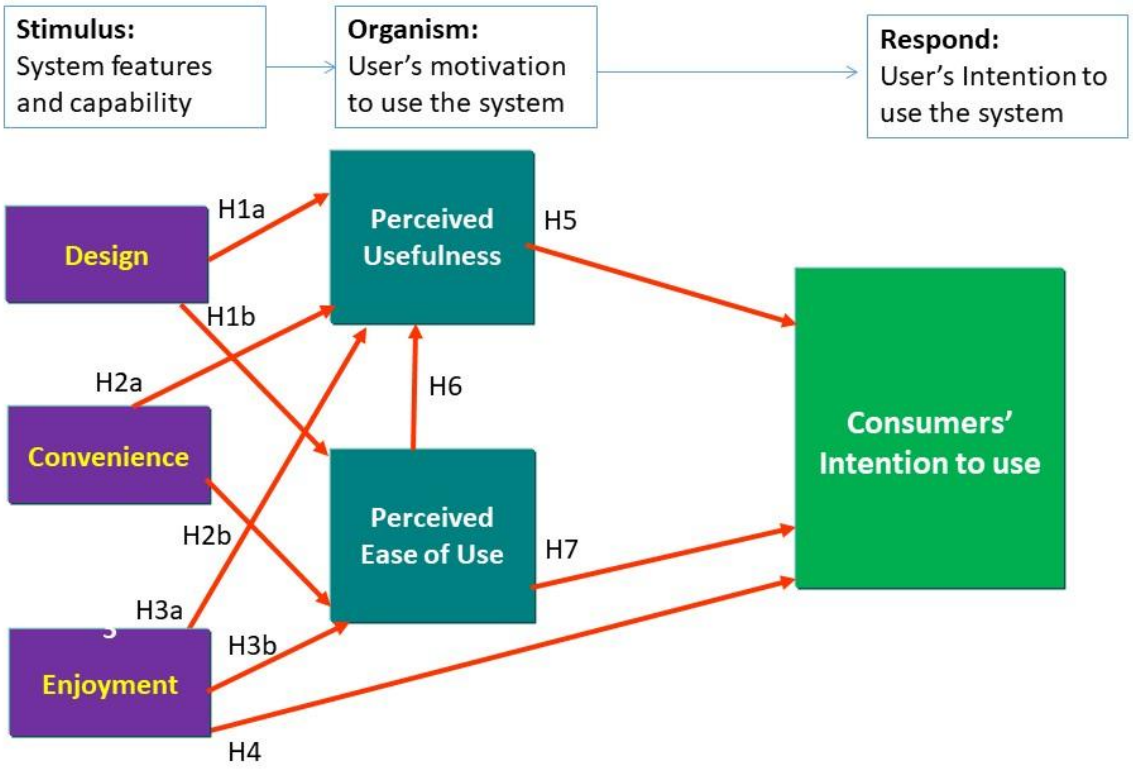

Figure 1: Stimulus Research model

The literature review of technology adoption models and theories for the novelty technology did the comparison of the technologies models and the justification of the use of stimulus research model [24, 28] that can be adapted for the research in Figure 1. This study will study the relationships between the variables shown in Figure 1 in order to determine their impact on consumers' intention to use the single platform payment system. The following hypotheses regarding these relationships were posited:

H1a: Design has positive relationship on perceived usefulness.
H1b: Design has positive relationship on perceived ease of use.
H2a: Convenience has positive relationship on perceived usefulness.
H2b: Convenience has positive relationship on perceived ease of use.
H3a: Enjoyment has relationship on perceived usefulness.
H3b: Enjoyment has relationship on perceived ease of use.
H4: Enjoyment is positively associated with consumers' intention to use
H5: Perceived usefulness has positively relationship with consumers' intention to use
H6: Perceived ease of use has relationship on perceived usefulness.
H7: Perceived ease of use of has positively relationship with consumers' intention to use.

METHODOLOGY

The population in this study includes only respondents who have used mobile phone or payment card or Internet within the last 12 months. Online survey questionnaires were utilized as the primary data collection method. Data from a total of 560 respondents that fulfilled these requirements were collected and used for this analysis. The sample size is more than adequate for non-probability sampling [18] as well as SEM studies [14, 19].

A five-point Likert-type scale was used to assess consumers' intention of adopting the system. When responding to the survey items, participants specify their levels of agreement to a subject given. The five point scale was selected to encourage respondents to make positive or negative choices [7] in order to produce more emphatic information [39]. The Cronbach's alpha related to the sample size (560) for the various variables being studied are as follows: consumers' intention to use (.88), design (.93), convenience (.91), perceived usefulness (.95), perceived ease of use (.96) and enjoyment (.88).

RESULTS

The analysis was conducted for each variable separately in order to gather a summary of respondents' demographic profiles and obtain a general feel of the data [41]. Table 1 outlines the demographic profiles of the survey respondents of Malaysia.

Table 1: Respondents profile

Variable	Frequency (n=560)	Percent (Total 100%)
Gender		
Male	329	58.8
Female	231	41.3
Marital Status		
Single	292	52.1
Married	268	47.9
Age		
< 25	122	21.8
26-40	264	47.1
41-55	143	25.5
> 55	31	5.5
Education		
Secondary/High school	102	18.2
College/university	383	68.4
Graduate school	75	13.4
Job position		
Top Management	36	6.4
Middle Management	246	43.9
Junior Management	78	13.9
Professional	78	13.9
Other	122	21.8
Owning		
1 item (Mobile/Internet/Card)	10	1.8
2 items(Mobile+Card/ Mobile+Internet/ Card+Internet)	358	63.9
3 items (Mobile, Internet & Card)	192	34.3

Measurement Model

All the goodness-of-fit indices satisfied the requirements with the validity assessment of the CFA model. Chi-Square was 125.13 (p=0.00, df =32). According to Tabachnick and Fidell (2007), the relative Chi-Square ($\chi 2$/df) at 3.91 is below the 5.0 required for good fit [44]. As stated by Hair et al. (2006), p-value is sensitive to the

sample size and it may be significant if using large sample size [14]. In absolute fit indices, the goodness of fit index (GFI) was .96, well higher than .90 [14]. Comparative fit index (CFI) was .98, above the .90 required for good fit [16]. Root mean square error of approximation (RMSEA) was .07, below the .08 required for good fit [4]. For the overall measurement, the results indicated a good fit to the model proposed.

Structural Model

Based on the results of measurement model, the structural model was examined with the theoretical links as shown in Table 2 with all of the goodness of fit indices that indicates an acceptable model.

Table 2: Goodness-of-fit statistics for measurement model

Goodness-of-fit Statistics	Level of Acceptance	Index Value
Absolute fit Measures		
Chi-square X^2	$p > 0.05$	5.421 *(p=0.067)*
Degree of freedom df	≥ 0	2
Root mean square error of approximation RMSEA	< 0.08	0.055
Goodness of fit index GFI	> 0.90	0.997
Incremental fit measures		
Comparative fit index CFI	> 0.90	0.999
Parsimonious fit measures		
Relative Chi-Square X^2/df	< 5	2.710

The overall structural model shows all paths of standardized regression weights (Table 3) are statistically significant at $p \leq 0.001$ and $P \leq 0.01$. The R^2 scores of perceived usefulness by perceived ease of use, enjoyment, convenience and design variables are .78. The R^2 scores of perceived ease of use by enjoyment, convenience and design variables are .62. The R^2 scores of consumer intention to use by enjoyment; perceived ease of use and perceived usefulness variables are .53.

Table 3: Standardized regression weights

H	SRW(β)				S.E.	C.R.	P	Results
H 1a	PU	<--	D	0.12	0.047	3.17	0.002	Significant p ≤ 0.01
H 1b	PEU	<--	D	0.31	0.037	3.46	***	Significant p ≤ 0.001
H 2a	PU	<--	C	0.18	0.036	4.94	***	Significant p ≤ 0.001
H 2b	PEU	<--	C	0.53	0.042	12.36	***	Significant p ≤ 0.001
H 3a	PU	<--	E	0.13	0.021	5.38	***	Significant p ≤ 0.001
H 3b	PEU	<--	E	0.10	0.019	3.90	0.003	Significant p ≤ 0.01
H 4	CI	<--	E	0.46	0.035	13.40	***	Significant p ≤ 0.001
H 5	CI	<--	PU	0.21	0.069	3.58	***	Significant p ≤ 0.001
H 6	PU	<--	PEU	0.57	0.032	17.83	***	Significant p ≤ 0.001
H 7	CI	<--	PEU	0.17	0.064	3.09	0.002	Significant p ≤ 0.01

Note: *** $p \leq 0.001$, ** $p \leq 0.01$, * $p \leq 0.05$

DISCUSSION, MANAGEMENT IMPLICATION AND CONCLUSION

Both 1a and 1b confirms previous findings that system designs are directly related to perceived ease of use and perceived usefulness [5, 9, 2, 31, 27]. H2a and 2b confirm existing studies which note convenience influences consumers' intention to use mobile payment through perceived usefulness and perceived ease of use [17]. Hypothesis 3a and 3b support similar conclusions in previous studies [47, 23] and [49] in regard to enjoyment and ease of use and perceived usefulness. Hypothesis 4 noted that enjoyment has direct relationship with consumers intention to use and the result supports conclusions in existing studies [3, 45, 42, 33, 23]. Hypothesis 5 confirmed the conclusions in existing studies [46, 40, 34, 38, 25] for perceived usefulness is positively associated with consumers' intention to use. Hypothesis 6 validates the existing studies [47, 26, 24] and [48, 24] in regard to perceived ease of use has relationship on perceived usefulness. Hypothesis 7 concluded and supported existing studies [9, 13, 39, 23, 27] in regard to perceived ease of use is positively associated with consumers' intention to use.

This study included design, convenience and enjoyment as an additional factor that extends the original TAM [10, 23, 27]. SEM analysis reveals a significant positive relationship between perceived ease of use and perceived usefulness, and this was the strongest predictor of usefulness with a path coefficient of 0.57. Consistent with previous studies, perceived usefulness is found to be predicted by perceived ease of use [10, 46, 15, 48, 37, 25, 26].

Design and convenience has a stronger significant relationship with perceived ease of use, in compari-

son to perceived usefulness. Perceived ease of use is vital for a complex system such as an integrated single platform payment system [36, 27]. Organisations intending to implement such a system should thus examine perceived ease of use and consider how to use it as a mediator to enhance perceived usefulness and consumers' intention to use. Results in previous studies by [47, 50, 23, 24] indicated that enjoyment had positive significant relationship with perceived usefulness and perceived ease of use. This study's uncovering of a significant relationship for enjoyment and consumers' intention to use a system was supported by other studies [3, 44, 43, 6, 23, 24]. Thus, enjoyment could be mediated by both perceived usefulness and perceived ease of use as well as direct relationship on consumers' intention to use the single platform payment system.

This results indicate that perceived usefulness, perceived ease of use and enjoyment contribute 21%, 17% and 46% respectively towards consumers' intention to use the single platform payment system. The study therefore establishes the roles of design, convenience, enjoyment, usefulness and ease of use positioning in determining intention to use the single platform payment system. Organizations providing payment solutions should be able to promote and facilitate the implementation of consumers' intention to use the single platform payment System with the suggested factors.

Respondents in this study like to use single platform E-payment Solution to replace their Card, Internet and Mobile payment because the single platform E-payment Solution is believed will improve their E-payment transactions and productivity, straight forward and easy to use, operation efficiency and reliable, have the design benefits that attracted consumers that allow consumers' to have control of their choices, can be used to solve my emergency need of funds as well as fantastic and enjoyable. Therefore, marketers and management of companies providing the single platform E-payment system should give priority to the reasons why respondents choose to use single platform E-payment Solution when designing the program. The information here can be used to support the E-payment applications for the E-marketplace. The study results provide the information needed for the development of new products and services caring for the social-environment that will create new businesses for green job in the single platform E-payment environment. Organizations will be able to utilize the study information for developing products and services that meet the consumers' single platform E-payment system while also fulfilling their objective of corporate social responsibility.

One major limitation of utilizing an online survey is that this only covers target audiences who have Internet access. Future studies along these lines should be expanded to non-internet users employing traditional survey methodologies. The data presented here is also localized to a Malaysian context and may not be easily generalized to other countries. However, it should be reasonably straight forward to replicate these studies in other countries where a single platform payment system is a technical viability.

In conclusion, the empirical results from the study suggest that design, convenience, enjoyment, perceived usefulness as well as perceived ease of use are all instrumental in influencing consumers' intention to use a single platform e-payment system. The results bear implications for organizations to seriously consider the consumers' perceptions about design, convenience and enjoyment that will lead to improving their perceived usefulness and ease of use of the single platform e-payment system.

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