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Perceived Usefulness, Perceived Enjoyment, Trust, and Continuance Intention

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Abstract**—** *Users consistency in using mobile apps has become significantly important for the app- related technology development. The aim of this paper is to investigate the effects of perceived usefulness, perceived enjoyment, and trust on the users' continuance intention to use mobile apps. This paper proposed a research framework to identify the predictors of continuance intention of mobile apps users and highlight the users experience when using mobile apps. Data were collected from mobile apps users in Malaysia. This study used structural equation modeling (SEM) with AMOS statistical software to test the research framework using a standardized and structured self-administered questionnaire. The results generate suggestions for mobile apps developers to prioritize perceived enjoyment, and trust in their planning to retain their users to continuously using the mobile apps. Although many studies have focused on continuance intention, but, still lack of studies have examined the behavior of individual differences based on demographics, such as continuance intention of mobile apps users in Malaysia. It generates useful guidance for mobile apps developers, specifically, aims on mobile apps users in Malaysia to effectively retain them in using their mobile apps.*

Keywords**—** *Perceived usefulness, Perceived enjoyment, Trust, Continuance intention.*

I. INTRODUCTION

The rapid advancement of the mobile internet and information technology infrastructure from the past decades have change the social activities and business trends. The convenience, effective and affordable way of communication, between one-to-one, and between one-to-many from mobile internet have become attractive tools for many individuals, and organizations (Watson, Mccarthy & Rowley, 2013). Based on Xiuyuan, Zhiying, Xiabing and Tailai (2018) highlighted that Chinese users that using mobile instant messaging were consistently grew since 2015, and as of June 2017, up to 92.3 percent of the overall Chinese mobile internet using mobile apps instant messaging. They further stated that since notable progression of mobile social apps was observed, a growing number of studies about mobile social apps have been executed.

Teo (2001) stated that the usage and adoption of information technology from different individuals have been recognized by earlier studies. Zhou, Jin and Fang (2014) highlighted that the importance of individual differences may derive from variety sources, for examples, demographics, earlier cognition of users about mobile apps usage, etc. Hence, the cognition of continuance intention among mobile apps users is essential in order to ensure this piece of technology or mobile apps also can survive and success in Malaysia industry technology.

The objective of this study is to investigate the predictors of continuance intention among mobile apps users in Malaysia. This paper begins by reviewing the literature about present study constructs including the development of hypotheses. Next, research

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framework and research methodology of present research are discussed, and followed by data analysis and research findings of present study. Lastly, conclusion is outlined.

II. LITERATURE REVIEW

II.I. Continuance Intention

Earlier, most of the studies have examined the antecedents of information system continuance in variety contexts. User continuance intention may change from time-to-time when user has experience in information technology usage, and user behaviors on information technology usage is a key motivation to information

technology usage (Bhattacherjee & Premkumar, 2004). Fulfilment and frustration behaviors about the mobile apps usage from users are critical to understand their subsequent beliefs and attitudes on mobile apps usage, that influence their behavior intention to continue use the mobile apps. Perceived usefulness, trust, social influence, shared norms, and tie strength are the identified critical antecedents that influence continuance intention of users on mobile networks or online social networks (Sun, Liu, Peng, Dong & Barnes, 2014; Akter, Ray & D'Ambra, 2013; Zhou, 2013).

II.II. Perceived Usefulness

Perceived usefulness refers to the usage of mobile apps will enhance the users' performance as a consumer or customer. It is in the extent of users' perception of using the information technology or mobile apps that manages to create benefit in their daily activities. Davis (1989) found that users' intention to use increases if they discover the information technology can generate benefit for them. Gefen and Straub (2000) highlighted that perceived usefulness is associated with reasons on the individuals whether to reject or accept the technology. Liao, Tsou and Huang (2007) also found that users are more likely to accept new technology if the experience of usage produce some benefit for them. Thus, this study proposes:

Ha1: Perceived usefulness has significant influence on mobile apps users' continuance intention.

II.III. Perceived Enjoyment

Perceived enjoyment refers to the extent that the experience of using a technology is being perceived as enjoyable (Davis, Bagozzi & Warshaw, 1992). Lu and Ling (2009) found that if the technology manage to produce pleasure and fun during the usage stage, the fundamental of users motivation to use the technology may remain. Liu and Li (2010) also found that the role of perceived enjoyment in understanding of mobile internet usage level has being recognized as influencer in determining users behavior on mobile internet. Thus, this study proposes:

Ha2: Perceived enjoyment has significant influence on mobile apps users' continuance intention.

II.IV. Trust

Trust refers to the function of ambiguity and risk of users' experience during the usage of mobile apps stage. In most contexts, trust plays a important role in determining continuance intention of users (Mou, Shin & Cohen, 2016; Akter, Ray & D'Ambra, 2013). However, Xiuyuan, Zhiying, Xiabing and Tailai (2018) highlighted that some earlier studies found that the relationship between trust and continuance intention still not consistent. For example, Susanto, Chang and Ha (2016) found that trust has not significantly influence on users' continuance intention on smartphone banking services. Yoon, Kim, Kim and You (2016) also found that long-term relationship may not directly linked to trust. In the study of Xiuyuan, Zhiying, Xiabing and Tailai (2018), they proposed tie

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strength is the bridge to connect the relationship between trust and WeChat users' continuance intention. Yet, this study considered trust has effect on continuance intention of mobile apps users in the context of demographic. Thus, this study proposes:

Ha3: Trust has significant influence on mobile apps users' continuance intention.

III. METHODOLOGY

Descriptive correlational study was performed on mobile apps users in Malaysia. Structural equation modeling (SEM) through employing analysis of moment structures (AMOS) statistical software was applied to produce the findings of present study.

Convergent validity is evaluated by assessing the average variance extracted (AVE) in this study. The cut-off point at about 0.5, indicating good convergent validity (Hair, Black, Babin & Anderson, 2010; Fornell & Larcker, 1981). A higher value of AVE appears when the items are truly representative of an unobserved construct. In SEM, construct reliability (CR) is comparable to Cronbach's alpha coefficient that evaluating the internal consistency of the instrument being used in each construct. The cut-off point at about 0.7, indicating a satisfactory internal consistency reliability (Hair, Black, Babin & Anderson, 2010).

III.I. Research Framework

Ary, Jacobs and Razavieh (2002) stated that a research framework shows the correlations among all the constructs that are identified in present study. A good research framework is manage to explain the input and output constructs that the present study uses and discloses the connection found from the literature review with empirical evidence supports to understand the research hypotheses. Figure 1 shows the research framework of this study.

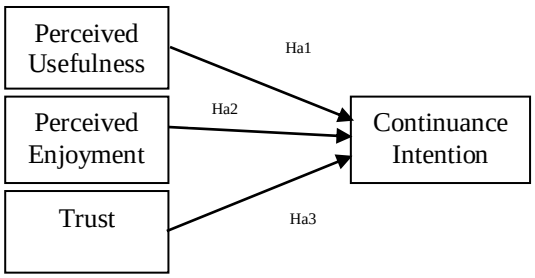

Figure 1: A research framework shows the relationship between the selected independent constructs and dependent construct (continuance intention).

III.II. Instrumentation

A total of 17 items with five-point Likert response options ranging from 1 "Strongly Disagree" to 5 "Strongly Agree" were employed to all constructs in the questionnaire of this study. The dependent construct of this study was measured using four-item scale adapted from continuance intention instrument developed by Ku, Chen and Zhang (2013), and Bhattacherjee (2001). The sample items were "I intend to continue using mobile apps", "I plan to keep using mobile apps", and "I expect to continue using mobile apps". A five-item perceived usefulness from the work of Pedersen (2005) was employed to measure mobile apps users' perceived usefulness. The sample items were "I think using mobile apps make me save time", "I think using mobile apps make me a better user", and "I think using mobile apps improve my efficiency as an user". Perceived enjoyment was measured by four-item scale of perceived enjoyment developed by Hong, Thong, Moon and Tam (2008). The sample items were "I think using mobile apps

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services is enjoyable", "I think using mobile apps services is pleasurable", and "I will have fun if I use mobile apps services". A four-item scale of trust was adapted from Ou, Pavlou and Davison (2014), and Zhou (2013) to measure trust, the selected independent construct for this study. The sample items were "Based on my prior usage experience, I think mobile apps is trustworthy", "Based on my prior usage experience, I think mobile apps is reliable", and "Based on my prior usage experience, I think mobile apps cares about users' interests".

III.II.I. Data Collection

The sampling frame encompassed Malaysian users from Selangor and Kuala Lumpur areas. Cross- sectional survey research technique was used in this study. Cross-sectional data collection technique allows researchers to collect data in a relatively fast and inexpensive method at one point in time from a large sample of people (Ary, Jacobs & Razavieh, 2002).

Sample size at least 400 if using SEM as suggested by Boomsma (1983). Lei and Lomax (2005) proposed the sample size in between 250 and 500 as this suggested range of sample size was mostly employed in SEM applications. A total of 550 standardized and structured self-administered questionnaires were distributed to mobile apps users, and 502 were successfully collected, resulting 91.3 percent of response rate. This study involved 29.9 percent male and 70.1 percent female respondents.

III.II.II. Data Analysis

Anderson and Gerbing (1988) stated that SEM has been broadly used in social science. A normal distributed data from the 502 responses and meet the SEM sample size requirement are appropriate to use SEM with AMOS statistical software to test the research framework of this study. Three stages of AMOS-SEM analysis were conducted to answer the present study of research hypotheses (Ha1, Ha2, and Ha3).

III.II.III. Confirmatory Factor Analysis (CFA)

CFA model was the first stage from AMOS-SEM analysis that used to applied on each individual construct in this study. Table 1 shows the value of CR, AVE and model fit from CFA model for continuance intention, perceived usefulness, perceived enjoyment, and trust. All the CR and AVE for each construct generated from each CFA model met the cut-off point of 0.7 for CR and 0.5 for AVE (refer to Table 1) (Hair, Black, Babin & Anderson, 2010). In addition, the model fit indices for each CFA model in this study as reported in Table 1 shows a good fit of the data. Hair, Black, Babin and Anderson (2010) suggested that between three and four fit indices that met the requirement were satisfactory to produce evidence of model fit. Each CFA model result as reported in Table 1 shows more than four fit indices such as GFI, CFI, IFI, NFI, and TLI that have a good fit with values above 0.9 with relative chi-square value less than 5.0, and RMSEA value less than or equal to 0.08.

Table 1: CR, AVE and Model Fit from CFA Model for Each Construct

Constructs	CR	AVE	Model Fit
Continuance intention	0.78	0.50	Relative Chi-Square = 4.235; RMSEA = 0.08; GFI = 0.991; AGFI = 0.957; CFI = 0.987; IFI = 0.987; NFI = 0.984; TLI = 0.962

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Perceived usefulness	0.78	0.50	Relative Chi-Square = 3.277; RMSEA = 0.07; GFI = 0.988; AGFI = 0.964; CFI = 0.982; IFI = 0.982; NFI = 0.974; TLI = 0.963
Perceived enjoyment	0.77	0.53	Relative Chi-Square = 4.300; RMSEA = 0.08; GFI = 0.992; AGFI = 0.960; CFI = 0.988; IFI = 0.988; NFI = 0.984; TLI = 0.963
Trust	0.81	0.52	Relative Chi-Square = 3.003; RMSEA = 0.06; GFI = 0.994; AGFI = 0.970; CFI = 0.993; IFI = 0.994; NFI = 0.990; TLI = 0.980

III.II.IV. Measurement Model

Measurement model was the second stage from AMOS-SEM analysis that used to test normality, outliers, discriminant validity, and model fit. All unobserved constructs with items in each CFA model that met the criteria (refer to Table 1) were transferred to the measurement model. In the measurement model, all these unobserved constructs were simultaneously incorporated into a path diagram.

The outcome of normality assessment from measurement model exhibited that all unobserved constructs met the requirement of skewness (-2 to +2), and kurtosis (-7 to +7) (Byrne, 2010). In other words, the collected data set was normally distributed in the present study. Subsequently, the outliers test concluded that there was no potential outliers in the collected data set. Besides that, the discriminant validity assessment showed that the correlation coefficient between any two constructs were less than 0.9 and met the suggested requirement from Hair, Black, Babin and Anderson (2010). The measurement model fit indices such as GFI, AGFI, CFI, IFI, NFI, and TLI exceeded the cut-off point of 0.9, with relative chi-square (1.382 < 5.0), and RMSEA (0.03 < 0.08). Thus, the fit indices showed that the measurement model of this study was good and fits the data, based on Hair, Black, Babin and Anderson (2010) suggested requirement.

III.II.V. Structural Model

Structural model was the final stage from AMOS-SEM analysis after the assessment and validation completed in measurement model. The preparation of present structural model was to test the research hypotheses on individual path. The model fit indices from present structural model was found met the required goodness-of-fit requirement as suggested by Hair, Black, Babin and Anderson (2010).

IV. FINDINGS

IV.I. Correlation Coefficient

Table 2 shows the correlations between selected independent constructs and continuance intention from the result of measurement model in this study. The direction of the correlation between two constructs were determined using correlation

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coefficient (r), that ranges in between positive 1 and negative 1. Meanwhile, the strength of the correlation between two constructs were based on the Guilford's (1956) rule of thumb.

The correlation between perceived usefulness and continuance intention was 0.22, indicating a positive and weak correlation towards continuance intention. There was a positive and moderate correlation between perceived enjoyment and continuance intention as shown by r = 0.42. However, the correlation between trust and continuance intention was - 0.32. Based on r = - 0.32, it shows a negative and weak correlation between trust and continuance intention.

Table 2: The Correlations between Selected Independent Constructs and Continuance Intention

Constructs	Continuance Intention
Perceived usefulness	0.22
Perceived enjoyment	0.42
Trust	-0.32

IV.II. Regression Weights

Table 3 shows the results of research hypotheses on individual path as demonstrated from present research framework (Figure 1). Findings from structural model of this study discover that out of the three coefficients related to the path connecting the selected independent constructs and continuance intention, two were significant (Ha2 and Ha3).

Perceived enjoyment contributed significantly towards continuance intention at 0.05 level of significance (β = 0.234; C.R. = 3.657; p = 0.000), and trust also contributed significantly towards continuance intention at 0.05 level of significance (β = -0.104; C.R. = -3.694; p = 0.009). Nonetheless, perceived usefulness did not contribute significantly towards continuance intention at 0.05 level of significance (β = 0.018; C.R. = 0.316; p = 0.752).

Table 3: Regression Weights

Hypothesis	Hypothesized Individual Path	B	S.E.	Beta (β)	C.R.	P
H_a1	Perceived usefulness → CI	0.023	0.073	0.018	0.316	0.752
H_a2	Perceived enjoyment → CI	0.258	0.070	0.234	3.657	0.000*
H_a3	Trust → CI	-0.102	0.060	-0.104	-3.694	0.009*

Note: CI = continuance intention; * p < 0.05

V. CONCLUSION

Based on the regression weights result of this study, we conclude that perceived enjoyment, and trust are the pertinent factors influencing mobile apps users' continuance intention in Malaysia. Mobile apps developers need to be more sensitive and prioritize

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these two factors if they wish to ensure the fulfilment behavior on using mobile apps from users at all time. To all mobile apps developers, these two factors are crucial to retain the mobile apps users to use the mobile apps.

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