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M-PAYMENT BEHAVIOURAL INTENTION: REVISITING THE MODELS USING THE CASE OF SARAWAK PAY

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ABSTRACT

Background and Purpose: With the acceleration of mobile payment usage in the daily routine, this study intends to examine the determinant factors on the user's behavioural intention on Sarawak Pay using the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and a modified model.

Methodology: A total of 195 Sarawak Pay users were selected using the purposive sampling technique to collect their responses through the questionnaire-based online survey. The PLS-SEM was utilised to examine the proposed hypotheses.

Findings: The study found that the modified model had the greatest explanatory and predictive power compared to conventional models. Moreover, the performance expectancy, facilitating conditions and attitude positively influenced the behavioural intention and use behaviour on the Sarawak Pay, while effort expectancy had a contrary effect. Furthermore, the social influence failed to impact the Sarawak Pay users' behavioural intention and their use behaviour.

Contributions: The findings clearly explained the drivers and inhibitors that inspired the users' behavioural intention and use behaviour on Sarawak Pay, which has critical implications for the

Sarawak government. This evidence was derived from three conventional models and a modified model.

Keywords: M-payment, mobile payment, unified theory of acceptance and use of technology, technology acceptance model, theory of reasoned action.

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1.0 INTRODUCTION

The advancement of technology and enhancement features of smartphones has driven a new feature focusing on transaction payment services, also known as mobile payment (or m-payment). This payment channel has permeated our daily routine. It provides fast, convenient and secured payment services that can be used anytime and anywhere, thus improving the efficiency and convenience of payment transactions (Leong et al., 2020). Moreover, m-payment services allow individuals to purchase and pay using mobile devices (Chen, Chen, & Chen, 2019). M-payment could be defined as the use of mobile devices like smartphones and personal digital assistants in payment processes (Dahlberg et al., 2008). Hence, individuals only have to pay with their mobile devices as the money has been stored in the payment platform.

Furthermore, with the advancement and convenience of m-payment, this payment channel has gained wide acceptance worldwide, and it is the fastest-growing mobile application (Chen et al., 2019). For instance, global mobile wallet users achieved 2.1 billion in 2019 (mobilepaymentsworld.com), and mobile payment transactions are projected to increase by 50% between 2020 and 2025 due to the COVID-19 crisis (globenewswrite.com). The total number of electronic payment transactions grew rapidly worldwide and was observed in developing markets, such as Malaysia. For instance, in Malaysia, the number of electronic payment transactions grew tremendously, with a 14% growth rate in 2020 (Bank Negara Malaysia, 2020). Besides that, the total volume of electronic wallet transactions also increased by 131% in the same period. Furthermore, the merchants' Quick Response (QR) code payment acceptance also increased by 164% in 2020. This incredible growth was due to the shifting from conventional payment towards contactless and online payments (Bank Negara Malaysia,

2020) and the government's initiatives in cultivating public awareness of e-payment services through several campaigns.

With the fantastic growth of this contactless payment channel, several m-payment service platforms, such as Boost, Grab Pay, Touch n Go, AliPay, Big Pay, and many others, have been introduced in Malaysia. However, all of these platforms were introduced and managed by private organisations. Recently, governments and related agencies have taken the initiative to introduce payment platforms such as Sarawak Pay and Kelantan Pay. This presented a slightly different perspective as those platforms offered by the government agencies had strong and well-established technical support, which was perceived to be better than the platform introduced by private organisations. This could increase the individual's intention and willingness to use these government-related platforms rather than the private organisations' platforms.

This study was exclusively focused on the Sarawak Pay platform, which the Sarawak state government introduced in 2017 as a step towards a cashless community. Moreover, this initiative aligned with the national agenda of promoting the Digital Economy and moving into the 4th Industrial Revolution era. However, the registered users of Sarawak Pay are still at a very low level, with only around 440,000 users as of September 2020 (Sarawak Pay, 2020), compared to the 2.9 million Sarawak population. This raised curiosity as the adoption of this payment platform was extremely low compared to other platforms. Therefore, it is crucial to understand the factors influencing users to adopt Sarawak Pay.

The use and acceptance of new technology, such as mobile payment, have become an interesting and "hot topic" among academics (Rondan-Catalunam, Arenas-Gaitan, & Ramirez-Correa, 2015). This was in line with the proposition that identifying the drivers that stimulated users' behaviour on mobile payment was a critical agenda (Leong et al., 2020). Moreover, the inconclusive findings of the determinants of behavioural intention towards mobile payment were observed in several previous studies. For instance, although performance expectancy positively explained behavioural intention (Abdullah, Redzuan, & Daud, 2020; Gupta & Arora, 2020; Tang, Aik, & Choong, 2021) while Sharma et al. (2021) and Sankaran and Chakraborty (2021) found an insignificant association. Similarly, Gupta and Arora (2020) and Tang et al. (2021) explored the significant relationship between effort expectancy, while others found no effect (Madan & Yadav, 2016; Yan et al., 2021). Subsequently, Abdullah et al. (2020), Al-Saedi et al. (2020), and Patil et al. (2020) discovered that social influence has a significant effect, while others found insignificant influence in predicting behavioural intention (Tang et al., 2021; Sharma et al., 2021; Susanto et al., 2020).

Furthermore, by acknowledging the importance of the behavioural intention on mobile payment, this study wishes to explore the significant determinants that influence the Sarawak Pay users' behavioural intention through the different conventional models from the theory of reasoned action (TRA), technology acceptance model (TAM) and unified theory of acceptance and use of technology (UTAUT), and also the proposed modified model. This was because those conventional models were introduced with different concepts and purposes but did not consider the contribution of the alternative model (Rondan-Catalunam et al., 2015). Ooi and Tan (2016) further argued that those conventional models may not be appropriate for explaining mobile technology adoption due to their limitations. Therefore, this paper used three conventional and modified models to evaluate the determinant factors. Moreover, Chen et al. (2019) mentioned that limited evidence provided a better understanding of how to encourage and inhibit individuals from using mobile payment. Hence, it is essential to investigate such a topic as it has a great implication for the industry, especially for the operators of Sarawak Pay, in increasing the number of users. Therefore, the modified model that integrated TRA, TAM, and UTAUT was proposed to better examine Sarawak Pay users' behavioural intentions.

This study offered new insights that differed from the empirical evidence in the literature. Firstly, this study focused exclusively on Sarawak Pay users' behavioural intentions. As mentioned above, Sarawak Pay was the first mobile payment platform introduced by the state government. Hence, the users could behave with different intentions and behaviour compared to conventional mobile payment platforms. Furthermore, the evidence was provided from the developing market perspective, as most previous studies focused on the developed markets. The internet facilities and infrastructure might not be well-equipped in a developing market, or, as in this case, Sarawak has wide coverage, and huge rural areas might not have sufficient internet coverage. Besides, the modified model from the three conventional models was proposed in this study to capture all the possible influences of different variables as suggested in the models. This modified model provided a more comprehensive predicting power than the conventional models, as the variables from the three models had been unified into one proposed model.

2.0 LITERATURE REVIEW

Several theories have been introduced to examine an individual's behavioural intention towards a technology, which examined the matter from different perspectives. Therefore, this study included three of these theories or models, namely TRA, TAM and UTAUT. Moreover, by acknowledging the different perspectives of these models, this study proposed a modified

model that integrated all variables from these models. A discussion of the different theories is provided.

2.1 Theory of Reasoned Action (TRA)

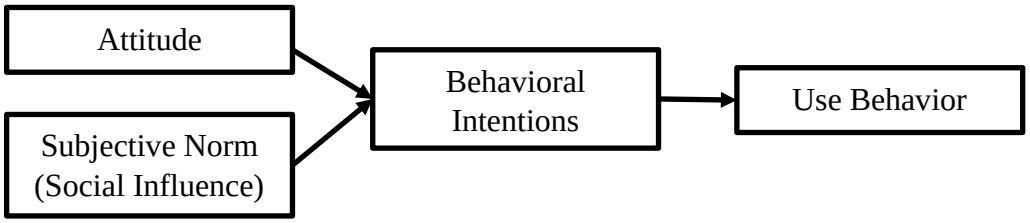

Figure 1: Theory of Reasoned Action (TRA)

Fishbein and Ajzen (1975) proposed the TRA that focused on two factors that predicted the individual's intention and behaviour, as presented in Figure 1. These two factors were attitude and subjective norms (or social influence). As proposed, an individual is likely to perform a certain behaviour if they have a positive attitude or are influenced by people in their social context. Thus, this intention would motivate their behaviour. However, TRA is not specifically for a certain behaviour or technology as it could be applied in other matters (Rondan-Catalunam et al., 2015).

2.2 Technology Acceptance Model (TAM)

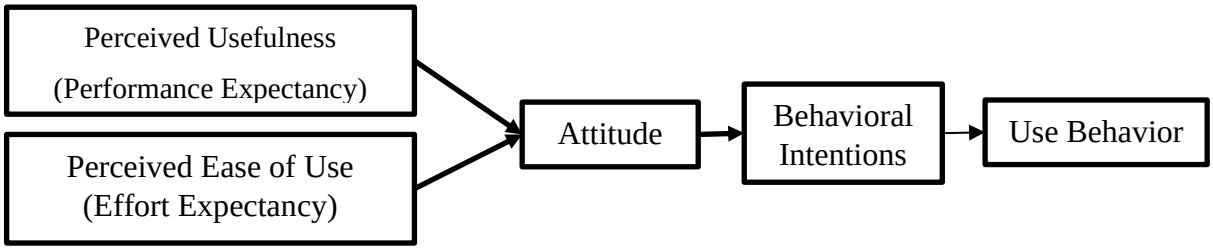

Figure 2: Technology Acceptance Model (TAM)

TAM was introduced by Davis (1989), whereby it was proposed that perceived usefulness and ease of use significantly influenced the individuals' behavioural intention to adopt a technology, as shown in Figure 2. The TAM was a revision from TRA, which was explicitly custom-made for the user's acceptance of the technology (Rondan-Catalunam et al., 2015). However, TAM was initially proposed to explore the electronic mail system adoption in organisational settings (Ooi & Tan, 2016), and this means it may not be appropriate in m-payment adoption was individual's voluntary behaviour. Moreover, this model was considered

to lack explanation ability as only two predictors were included in the model to determine the individual's intention, and there could be other predictors that influenced the intention (Gao & Bai, 2014). Therefore, the TAM model was extended with other predictors that were relevant to technology (Schierz, Schilke, & Wirtz, 2010). Yet, TAM remained one of the broadly used frameworks, although there were limitations (Slade et al., 2015).

2.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

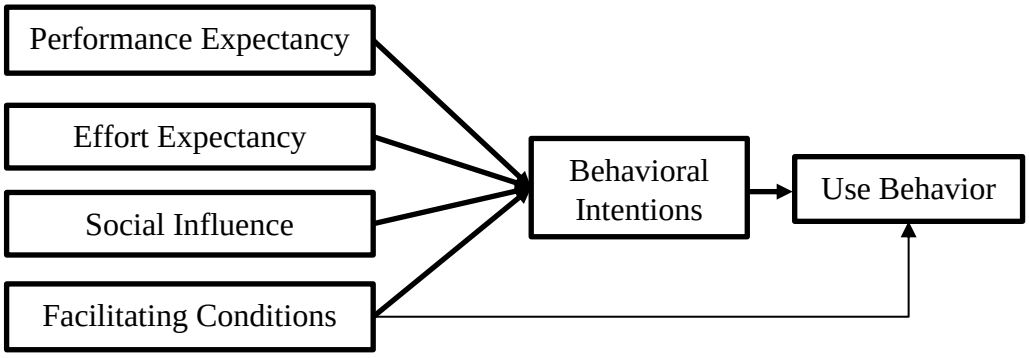

Figure 3: Unified Theory of Acceptance and Use of Technology (UTAUT)

Due to the need for an integrated model that could unify the variables in the different models, Venkatesh et al. (2003) proposed the UTAUT that integrated important elements from different models. UTAUT was the most inclusive model for explaining the acceptance of technology. As presented in Figure 3, four major factors were included in the model: performance expectancy, effort expectancy, social influence and facilitating conditions, and all four factors were assumed to influence the behavioural intention and use behaviour significantly. Moreover, the behaviour of use could be influenced by facilitating conditions. As Madan and Yadav (2016) mentioned, UTAUT was the most frequently used model to study new technology or system adoption behaviour. However, the adoption behaviour of the new technology proposed by UTAUT is also mainly designed for employees in organisational settings (Ooi & Tan, 2016). Therefore, this also suggests that it may not suit the m-payment usage that is heavily based on an individual's voluntary use behaviour. However, UTAUT did not include the potential influence of attitude proposed in TRA and TAM.

2.4 Proposed Modified Model

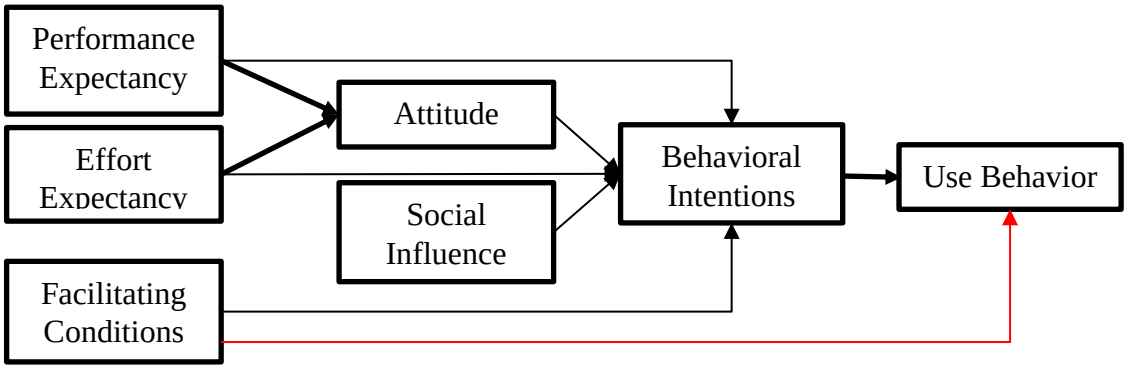

Figure 4: Proposed Modified Model

Due to the shortfalls of the models above, such as those designed for different contexts, purposes and technologies, the above-modified model was proposed. It is an integration model from the TRA, TAM, and UTAUT, each with a certain limitation. As presented in Figure 4, the user's behavioural intention for mobile payment could be determined by five predictors: attitude, performance expectancy, effort expectancy, social influence, and facilitating conditions. Moreover, attitude can be predicted by performance expectancy and effort expectancy. Lastly, the use behaviour of an individual was determined by behavioural intention and facilitating conditions.

2.4.1 Performance Expectancy

The performance improvement expectation of an individual with the adoption of certain technology denotes performance expectancy (Venkatesh et al., 2003). An individual could perceive the purchasing process to improve by adopting mobile payment services (Madan & Yadav, 2016). As Madan and Yadav (2016) mentioned, the performance expectancy was similar to the perceived usefulness in the TAM. Therefore, the performance expectancy was assumed to be similar to PU. Empirically, the significant relationship between the performance expectancy or perceived usefulness on the behavioural intention to use technology was proven (e.g. Abdullah et al., 2020; Madan & Yadav, 2016; Gupta & Arora, 2020; Kuciapski, 2017; Tang et al., 2021). However, the insignificant association of the performance expectancy was also reported (e.g. Sharma et al., 2021; Sankaran & Chakraborty, 2021; Susanto et al., 2020). Moreover, as suggested in TRA, performance expectancy significantly influences the individual's attitude toward performing a behaviour. This proposition was supported by several studies, whereby the performance expectancy or perceived usefulness was found to significantly impact attitude (Patil et al., 2020; Liebana-Cabanillas, Luna, & Montoro-Rios,

2017; Chawla & Joshi, 2019; Flavian, Guinaliu, & Lu, 2020). Therefore, the following hypotheses were suggested:

H_1: There is a significant relationship between performance expectancy and behavioural intention.

H_2: There is a significant relationship between performance expectancy and attitude.

2.4.2 Effort Expectancy (EE)

Like the perceived ease of use in TAM, effort expectancy refers to the individuals who presume the ease of using the technology in their daily routine with no complicated learning process (Madan & Yadav, 2016). The ease of use was important to drive an individual to use the technology. When mobile payment is easily applied to transactions, it could attract more individuals. Therefore, a positive association was expected between effort expectancy and behavioural intention to use mobile payment. This was supported in prior studies, whereby the effort expectancy or perceived ease of use positively influenced the individual's behavioural intention to use new technology (e.g. Gupta & Arora, 2020; Tang et al., 2021; Al-Saedi et al., 2020). However, the insignificant effect of the effort expectancy was also found (e.g. Yan et al., 2021; Susanto et al., 2020; Kaur & Arora, 2021). Similar to performance expectancy, the significant effect of effort expectancy or perceived ease of use towards attitude was also acknowledged in numerous studies (Patil et al., 2020; Flavian et al., 2020). For that reason, the following hypotheses were proposed.

H_3: There is a significant relationship between effort expectancy and behavioural intention.

H_4: There is a significant relationship between effort expectancy and attitude.

2.4.3 Facilitating Conditions

Facilitating conditions were the construct proposed in UTAUT (Venkatesh et al., 2003). It refers to the likelihood of individuals who are confident that the organisation provides technical support and backup for the users when they use the technology (Venkatesh et al., 2003). Madan and Yadav (2016) defined the facilitating conditions as the resources and physical environment required when using the technology. An individual is likely to use a technology or mobile payment service if they believe there will be resources and support when required. Therefore, it was expected that there was a significant relationship between facilitating conditions and behavioural intention, as concluded in previous studies (e.g. Abdullah et al., 2020; Madan &

Yadav, 2016; Gupta & Arora, 2020; Patil et al., 2020). However, other studies found otherwise results (e.g. Sharma et al., 2021; Kaur & Arora, 2021). Furthermore, as proposed in the UTAUT model, the facilitating conditions could predict the individuals' use behaviour as the individuals are likely to use the services when they realise that the services provided a certain degree of technical support and resources, besides being well-matched with other technologies (Alalwan, Dwivedi, & Rana, 2017). The relationship was observed in different research contexts, such as e-money (Susanto et al., 2020), mobile banking (Alalwan et al., 2017) and e-government (Camilleri, 2020). Thus, the following hypotheses were proposed.

H_5: There is a significant relationship between the facilitating conditions and behavioural intention.

H_6: There is a significant relationship between the facilitating conditions and use behaviour.

2.4.4 Social Influence

The influence of people's surroundings on the individuals' intention to use technology has been defined as social influence or subjective norm. The opinions of peers, family, and the media could affect the adoption decisions of individuals (Gao & Bai, 2014). Chen et al. (2019) remarked on the influence of people in social networks on individuals' behaviour. An individual tends to seek the opinions of others when there is insufficient information to decide on the usage of the technology (Gao & Bai, 2014). Therefore, social influence could be the main predictor of new technology acceptance (Al-Saedi et al., 2020). A significant relationship between social influence and behavioural intention was consistently reported (e.g. Abdullah et al., 2020; Madan & Yadav, 2016; Al-Saedi et al., 2020; Patil et al., 2020; Kuciapski, 2017). However, the insignificant role of social influence is documented in other studies (e.g. Gupta & Arora, 2020; Tang et al., 2021; Sharma et al., 2021; Susanto et al., 2020). Therefore, the following statement was hypothesised.

H_7: There is a significant relationship between social influence and behavioural intention.

2.4.5 Attitude

Empirically, the influence of attitude towards individuals' behavioural intentions has been widely recognised. Attitude refers to the degree to which an individual has a favourable or unfavourable evaluation of the given behaviour (Ajzen, 1991). Therefore, an individual's attitude significantly influences the intention to use mobile payment (Teng et al., 2020). This

was supported by several studies, which also found the same association. For instance, Liebana-Cabanillas et al. (2017), Patil et al. (2020), and Flavian et al. (2020) revealed the significant influence of attitude on the individual's intention. Therefore, the following hypothesis was suggested.

H_8: There is a significant relationship between attitude and behavioural intention.

2.4.6 Behavioural Intention

Behavioural intention is defined as the likelihood of an individual's anticipation to behave in a certain behaviour (Fishbein & Ajzen, 1975), such as using mobile payment. Throughout the literature, numerous studies have acknowledged the predictive ability of the behavioural intention towards the individuals' use behaviour (e.g. Gupta & Arora, 2020; Patil et al., 2020; Alalwan et al., 2017; Susanto et al., 2020). Moreover, as mentioned by Patil et al. (2020), behavioural intention could capture several motivational factors that cause individuals to react to a behaviour. Thus, behavioural intention was also treated as the dependent variable to determine the antecedents of the individual's willingness to use the mobile payment (Patil et al., 2020). Therefore, an individual's acceptance on the technology or mobile payment could be used as a predictor of actual behaviour. Hence, the following hypothesis was suggested.

H_9: There is a significant relationship between behavioural intention and use behaviour.

3.0 RESEARCH DESIGN

To examine the antecedents of mobile payment behavioural intention, the quantitative research approach was employed as the primary data was collected from the targeted population: Sarawak Pay users. The study used the purposive sampling method to select the respondents, as only the Sarawak Pay users were invited to participate. The final sample size was 195 respondents, which met the minimum sample size of 103, as determined using the power analysis with an effect size of 0.15, a power level of 80% and seven predictors. The responses were collected from the online questionnaire using Google Forms. The questionnaire was divided into three sections: Section A was related to the respondents' demographic profiles, Section B was the measurement items related to the independent variables, and Section C focused on the measurement items for mediators and dependent variables. The measurement items were adapted from several sources, such as Akbar (2013), Patel (2016), Flavian et al. (2020), and Yan et al. (2021), with a total of 27 items for seven constructs. The 5-point Likert

scale was used to indicate the level of agreement and disagreement of respondents on each item. The measurement items were prepared in English and translated into Bahasa Malaysia to avoid misunderstandings. The respondents' demographic profiles were analysed using the descriptive frequency in the SPSS software. The path relationship of the different models was analysed using the SmartPLS software through the partial least square structural equation modelling (PLS-SEM). Before the path relationship, reliability and validity tests were performed using the same software together with the predictive relevance of the constructs.

4.0 ANALYSIS AND FINDINGS

The frequency of the respondents' demographic profiles is presented in Table 1. The respondents were mainly dominated by female users (64.10%), and the remaining were male users. The majority of the respondents were 25 years old and below (37.43%), followed by other users aged between 26 to 35 years old (30.77%) and 36 to 45 years old (17.44%). Regarding occupation, 65 respondents were working in the private sector, 50 were students and 44 were government servants. Table 1 also showed that 61% of the respondents were single, and 38% were married. By comparing the most frequently used services, approximately two-thirds of the respondents used Sarawak Pay when they purchased items from the supermarket, food court, convenience shop, and others, followed by the payment of utility bills.

Table 1: Respondents' profiles

Demographics	Frequency	Percent (%)
Gender		
Male	70	35.90
Female	125	64.10
Age Group		
25 year old and below	73	37.43
26 to 35 year old	60	30.77
36 to 45 year old	34	17.44
46 to 55 year old	19	9.74
56 year old and above	9	4.62
Occupation		
Government Servants	44	22.56
Private Sector Servants	65	33.33
Self-Employed / Business Owner	18	9.23
Students	50	25.64
Retirees	5	2.56
Others	13	6.67
Marital Status		
Single	119	61.02
Married	74	37.95
Others	2	1.03
Most Frequently Used		
Assessment bill of Local Councils	11	5.64
Utilities Bills	31	15.90
Hotels managed by SEDC	1	0.51
Education fees or loan repayment	3	1.54
Telecommunications Bills	8	4.10
Supermarket, Food court, Convenience shop, etc.	128	65.64
Others	13	6.67

Firstly, the study evaluated the multivariate normality of the dataset using Mardia's coefficient procedure; the results are provided in Table 2. As presented, Mardia's multivariate kurtosis for all models was greater than the threshold level of 20, indicating the dataset was randomly distributed (Byrne, 2013; Kline, 2011). Hence, the PLS-SEM was the appropriate technique to examine the relationship. Moreover, Table 2 also showed the Standardised Root Means Square Residual (SRMR), which implied that all datasets for different models were goodness-of-fit as the SRMR values were lower than 0.08 (Hu & Benlter, 1999). The possibility of the common

method variance issues was associated with the primary data being collected from a one-time survey with the same measurement scales (Hakimi et al., 2019). Therefore, Harman's single-factor test was utilised to assess the existence of the common method variance. As provided in Table 2, the variance was explained in one factor, in which all four models were less than 50%, which indicated the common method variance was not present in the models.

Table 2: Goodness-of-fit and common method bias

Model	Mardia's multivariate Kurtosis	SRMR Result	Harman's Single Factor Test
TRA	30.3555	0.0640	47.7200%
TAM	48.0573	0.0760	46.1000%
UTAUT	63.1798	0.0780	41.3480%
Modified	84.3157	0.0750	39.8480%

Before assessing the structural model, the model measurements had to be performed, and the results are presented in Table 3. In this study, the outer loading was used to evaluate the convergent validity, and the results indicated that all items had met the minimum threshold value of 0.708 (Hair et al., 2017), except for two measurement items for facilitating conditions and one item for social influence that was deleted due to the lower loading values. Moreover, the average variance extracted (AVE) values for all constructs were also greater than the suggested level of 0.5 (Hair et al., 2017). They indicated that the convergent validity requirements of all constructs were met. The internal consistency was evaluated using the composite reliability (CR), and the results showed that all constructs had passed the 0.7 level (Gefen, Straub, & Boudreau, 2000).

Table 3: Construct reliability and convergent validity

Constructs	Items	Loading	AVE	CR
Effort Expectancy (EE)	EE1	0.7960	0.6340	0.8740
	EE2	0.8090		
	EE3	0.7490		
	EE4	0.8290		
Performance Expectancy (FE)	PE1	0.7350	0.6320	0.8720
	PE2	0.8710		
	PE3	0.8400		
	PE4	0.7230		
Facilitating Conditions (FC)	FC1	0.9130	0.8190	0.9010
	FC2	0.8980		
Social Influence (SI)	SI1	0.9220	0.7560	0.9250
	SI2	0.9230		
	SI3	0.8250		
	SI4	0.8020		
Attitude (ATT)	ATT1	0.8820	0.7970	0.9400
	ATT2	0.8930		
	ATT3	0.9170		
	ATT4	0.8780		
Behavioural Intentions (BI)	BI1	0.8710	0.7380	0.9180
	BI2	0.8490		
	BI3	0.8790		
	BI4	0.8350		
Use Behaviour (UB)	UB1	0.9650	0.9290	0.9630
	UB2	0.9630		

Additionally, the Heterotrait-Monotrait (HTMT) ratio was used to evaluate the discriminant validity, and the results are presented in Table 4. All constructs' discriminate values were lower than 0.85 (Kline, 2011) except for one construct, which was lower than the most liberal level of 0.90 (Gold, Malhotra, & Segars, 2001). This result indicated that the discriminant validity of the models was determined. As the multivariate technique was used to examine the relationship between the constructs, the multicollinearity of the predictors had to be assessed. The variance inflation factor (VIF) was employed to assess the multicollinearity problem, as displayed in Table 4. The results revealed that all VIF values were less than 3.30, which indicated that the multicollinearity issues did not occur in the models (Diamantopoulos & Siguaw, 2006).

Table 4: Discriminant validity using HTMT and VIF

	ATT	BI	EE	FC	PE	SI	UB	VIF (BI)	VIF (UB)
ATT								2.0760	
BI	0.8560								1.0000
EE	0.6570	0.5170						1.8620	
FC	0.5300	0.5240	0.6850					1.5030	
PE	0.7510	0.7260	0.6330	0.3930				2.0230	
SI	0.4240	0.4370	0.3260	0.2380	0.5650			1.3340	
UB	0.6060	0.7380	0.5080	0.4500	0.5650	0.2680			

The path coefficients of the proposed hypotheses were examined using the bootstrap with 5,000 re-sample techniques. The results of the structural modelling were presented in Table 5 with the R-squared (R^2) and the predictive relevance (Q^2) for all models. The results of the PLS path analysis from the SmartPLS for the modified model are displayed in Figure 5. The results of TRA indicated that social influence (β=0.1110) and attitude (β=0.7250) had a significant association with behavioural intention, and thus, the hypotheses of (H_7 and H_8) for TRA were accepted. A positive significant relationship was also found between behavioural intention and use behaviour (β=0.6700). Moreover, the results of TAM showed that all hypotheses were supported (H_2, H_4, H_8 and H_9). Specifically, the results showed that both performance expectancy (β=0.4800) and effort expectancy (β=0.3210) exhibited a positive significant association with attitude, whereby attitude (β=0.7680) posited the same influence towards behavioural intention. Similar to TRA, the positive significant relationship between the behavioural intention and use behaviour was also proven (β=0.6700).

Furthermore, Table 5 also provides the results of UTAUT. Unlike the previous models that supported all the proposed hypotheses, slightly different results were found in UTAUT, whereby both effort expectancy (β=0.0330) and social influence (β=0.1060) had no significant relationship with behavioural intention. Thus, H_3 and H_7 for UTAUT were rejected. However, a significant association between the performance expectancy (β=0.4710), facilitating conditions (β=0.2470) and behavioural intention was found, and thus H_1 and H_5 for UTAUT were accepted. Moreover, the use behaviour predicted by the facilitating conditions also proved that H_6 for UTAUT was supported. The significant relationship between behavioural intention and use behaviour (β=0.6230) was again proven.

Lastly, the proposed modified model that integrated TRA, TAM and UTAUT was also examined. The results in Table 5 showed that performance expectancy (β=0.1980), facilitating

conditions (β=0.1440) and attitude (β=0.6120) presented positive associations with behavioural intention, while social influence (β=0.0570) remained insignificant, as shown in TAM. This indicated that in the UTAUT model, H_1, H_5, and H_8 were supported, but H_7 was rejected. Surprisingly, the effort expectancy (β=-0.1040) turned to negative significance in this modified model. The performance expectancy (β=0.4800) and effort expectancy (β=0.3200) remained a significant relationship with attitude. Furthermore, the positive significant relationship between behavioural intention and use behaviour (β=0.6220) was also identified. The modified model had proven the significant relationship between the facilitating conditions and use behaviour again, and thus H_6 was supported (β=-0.1100).

Table 5: Path-coefficients, R-squared (R^2) and predictive relevance (Q^2)

Hypothesis		**TRA**	**TAM**	**UTAUT**	**Modified**
H_1	PE - > BI			0.4710 (6.0880)**	0.1980 (2.7010)**
H_2	PE - > ATT		0.4800 (6.9490)**		0.4800 (6.8250)**
H_3	EE - > BI			0.0330 (0.4910)	-0.1040 (1.8270)*
H_4	EE - > ATT		0.3210 (4.5120)**		0.3200 (4.4540)**
H_5	FC - > BI			0.2470 (3.5860)**	0.1440 (2.3910)**
H_6	FC - > UB			0.1090 (1.7840)*	0.1100 (1.7930)*
H_7	SI - > BI	0.1110 (2.0850)*		0.1060 (1.6580)	0.0570 (1.1090)
H_8	ATT - > BI	0.7250 (15.7320)**	0.7680 (19.1420)**		0.6120 (7.9810)**
H_9	BI - > UB	0.6700 (15.4280)**	0.6700 (15.3420)**	0.6230 (12.1490)**	0.6220 (11.9440)**
R-Squared (R^2)					
Attitude			0.4910		0.4910
Behavioural Intentions		0.6010	0.5900	0.4560	0.6300
Use Behaviour		0.4490	0.4490	0.4600	0.4590
Predictive Relevance ($Q^{2)}$					
Attitude			0.3670		0.3670
Behavioural Intentions		0.4160	0.4110	0.3110	0.4330
Use Behaviour		0.3960	0.3960	0.4040	0.4030

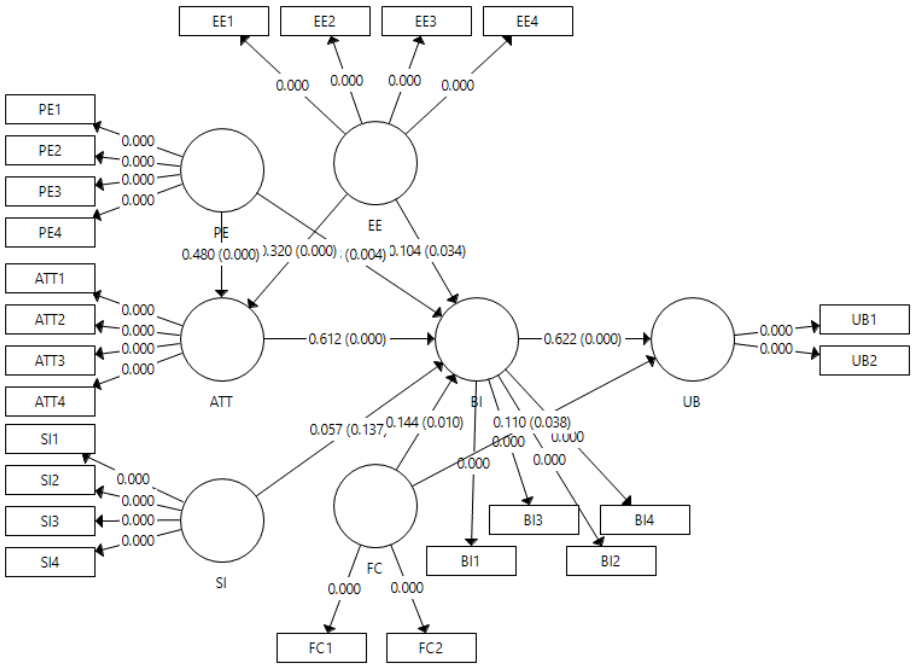

Figure 5: Results of path analysis from SmartPLS

Generally, the results of the different models indicated some consistent and inconsistent findings. For instance, the performance expectancy, facilitating conditions and attitude were found to have a significant relationship with behavioural intention in all models. Besides, performance and effort expectancy also consistently had a significant relationship with attitude in both TAM and the modified model. All four models also acknowledged the significant relationship between behavioural intention and use behaviour. However, inconsistent findings were found in the relationship between effort expectancy and social influence towards behavioural intention. For example, the negative significant influence of effort expectancy was found in the modified model, but an insignificant association was remarked in the UTAUT model. Similarly, a significant positive association between social influence and behavioural intention was revealed in TRA, but insignificant results were found in UTAUT and the modified model.

By focusing on the R-squared and predictive relevance among the four models, the results proved that the proposed modified model had the greatest explainability and predictive power than other models. For instance, the R-squared for the modified model was 63%, which was greater than the others. This indicated that the five predictors could explain 63% of the variance in the behavioural intention in UTAUT. As the predictive relevance value of all models was greater than zero, thus this signified the predictive relevance and validity of the models. Specifically, the modified model's predictive relevance (Q^2) (0.4330) was the highest

among all models. This proved that the proposed modified model had superior determination and predictive power than conventional models. Surprisingly, even though the TRA was the oldest model with the least predictors, the determination level and predictive power were greater than TAM and UTAUT. Hence, this indicated that the latest or complex models were not better.

Each predictor's effect size (f^2) was evaluated, and the results are presented in Table 6. The four predictors of behavioural intention in the modified model had a small effect size (f^2<0.15), while attitude had a large effect size (f^2>0.35) on behavioural intention. The small effect size of effort expectancy on attitude was also observed, but a moderate effect size was reported for performance expectancy. Across the four models, attitude was found to have a large effect on behavioural intention, while social influence had the least effect size. Moreover, the large effect size of behavioural intention on the use behaviour was also found in all four models.

Table 6: Effect size (f^2)

Effect Size (f^2)	TRA	TAM	UTAUT	Modified
PE - > BI		0.3330	0.2510	0.0530
PE - > ATT				0.3340
EE - > BI		0.1490	0.0010	0.0160
EE - > ATT				0.1480
FC - > BI			0.0780	0.0380
FC - > UB			0.0180	0.0180
SI - > BI	0.0260		0.0160	0.0070
ATT - > BI	1.1080	1.4480		0.4900
BI - > UB	0.8140	0.8160	0.5820	0.5780

5.0 DISCUSSION

This study concluded that the proposed modified model had greater explanatory and predictive power than the other three conventional models. This provided evidence that the conventional models should be extended by incorporating other possible variables as the individuals' behavioural intentions were getting complex. Thus, it wasn't easy to be explained by the conventional models. However, this does not mean that more predictors in a model are better, as was proven in this study. For instance, the proposed modified model that consisted of five predictors towards behavioural intention had the highest R-squared and predictive relevance values. Still, the TRA had greater explanatory and predictive power compared to TAM and

UTAUT, although TRA had only two predictors. Surprisingly, the explanatory and predictive power for UTAUT was the least, although four predictors were included in this model.

In terms of the determination of antecedents of behavioural intention, this study revealed the significant effect of performance expectancy, facilitating conditions and attitude on the Sarawak Pay users' behavioural intention and use behaviour. However, the negative significant influence of effort expectancy on behavioural intention was also reported in the modified model but not in UTAUT. Moreover, both performance and effort expectancy had a significant association with attitude. The effects of facilitating conditions and behavioural intention on use behaviour were also proven in this study.

The performance expectancy was found to have a significant relationship with behavioural intention, thus H_1 was supported. The Sarawak Pay users acknowledged that the expected improvement in the payment transaction process by using mobile payment had significantly influenced their behavioural intention to use mobile payment. This was in line with Patil et al. (2020), Liebana-Cabanillas et al. (2017), and Chawla and Joshi (2019), who also discovered the same findings. However, a reverse finding was found for effort expectancy, whereby the user perceived that the Sarawak Pay platform was not easy to use and required a certain learning process before it could be applied. Thus, H_3 was supported but in a negative direction. This contradicts the empirical evidence of Abdullah et al. (2020), Madan and Yadav (2016), and Gupta and Arora (2020).

Furthermore, the significant relationship between facilitating conditions and behavioural intention further signified the influence of technical support and backup and the resources and physical environment required for the Sarawak Pay users to use the platform (H_5). This implies that users are more likely to use Sarawak Pay when they believe the support and backup, together with the resources provided by the Sarawak government, are sufficient. The significant effect of facilitating conditions on behavioural intention was also consistent with previous studies (Abdullah et al., 2020; Madan & Yadav, 2016; Gupta & Arora, 2020; Patil et al., 2020). However, H_7 was rejected as the evidence found that social influence failed to influence the user's behavioural intention to use Sarawak Pay. This showed that influences from peers, family, or someone on the social network did not impact the user's behavioural intention to use Sarawak Pay. However, this finding identified various results with some of the prior studies, which found that social influence impacted behavioural intention (Abdullah et al., 2020; Madan & Yadav, 2016; Patil et al., 2020; Kuciapski, 2017).

Subsequently, the results discovered that attitude was the most influential variable for the user's behavioural intention to use the Sarawak Pay (H_8). This indicated that if an individual is

likely or favourable to use the platform, it will convert into actual behaviour. This finding was consistent with Liebana-Cabanillas et al. (2017), Patil et al. (2020) and Flavian et al. (2020). Lastly, the actual behaviour of the Sarawak Pay users was significantly influenced by the facilitating conditions and behavioural intention, and thus H_6 and H_9 were supported. This showed that the users use the platform if they know they are supported with sufficient resources and technical backup by the platform operators. Moreover, when users intend to use the platform, they will use it in the near future. These findings were similar to those of Alalwan et al. (2017) and Susanto et al. (2020), who also acknowledged the significant association between facilitating conditions and behavioural intention on the use behaviour.

6.0 CONCLUSION, IMPLICATIONS AND LIMITATIONS

In summary, this study examined the factors that significantly influenced the users' behavioural intention and use behaviour through the different conventional models and a modified model to offer new insights into the user's behavioural intention, especially from Sarawak Pay, which is a mobile payment platform owned by the Sarawak government. The responses from the Sarawak Pay users showed that the modified model that integrated TRA, TAM, and UTAUT had the greatest explanatory and predictive power compared to the conventional models. Furthermore, the findings also revealed that the users' performance expectancy, facilitating conditions and attitude were the significant determinants for behavioural intention and use behaviour. Although the effort expectancy also posited a significant impact but in a negative direction, which indicated that the effort expectancy impeded the users' behavioural intention and use behaviour. Besides, the findings also showed that social influence did not influence the users' behavioural intention.

This study applied the three conventional models and proposed a modified model to examine the users' behavioural intention to use Sarawak Pay. The evidence showed that the proposed modified model had the greatest explanatory and predictive power compared to conventional models. However, although the TRA was not designed for the technology context, it appeared to have greater explanatory and predictive power than TAM and UTAUT, which were introduced for technology acceptance behaviour. Moreover, the results also showed that attitude had the greatest impact on behavioural intention, but social influence had failed to influence the user's intention. Furthermore, opposite findings of the effort expectancy were reported, which signified that the complicated procedures of the platform would discourage or inhibit the users from using the platform. This study enriched the literature as the evidence was provided from a mobile payment platform provided by the government, as the platform's

owner. This might influence the behavioural intention towards the platform, which was the major difference from other mobile payment studies that mainly focused on platforms owned by private organisations.

For the managerial implications, this study revealed the antecedents that influenced the behavioural intention of users to use Sarawak Pay. Therefore, the Sarawak Pay platform operators should utilise this finding to better understand which factors encourage or impede the users to use their platform. For instance, attitude had the greatest influence, which indicated that nurturing the user's attitude could posit the user's intention and behaviour to use Sarawak Pay. Moreover, the platform's advantages or projected ease of use would raise the behavioural intention and use behaviour. Furthermore, sufficient support, or technical backup and resources provided by the platform operator, inspired users to use the mobile payment platform. However, in this study, the users acknowledged that the Sarawak Pay was complicated and not easy to use, and they needed to go through a certain learning process before performing the transactions. Thus, the effort expectancy had constrained the users to use Sarawak Pay as their mobile payment platform. Therefore, the Sarawak government should simplify the platform to nurture usage, as this could be the factor that caused the low level of users' registered rate. Therefore, with these findings, the operator is now well-informed about the drivers and inhibitors that could influence the behavioural intention to use the Sarawak Pay.

The limited generalisability is one of the limitations of this study, as the responses of the samples were collected only from the Sarawak Pay users who resided in Sarawak. Future studies should have a larger geographical focus that could include the users of different mobile payment platforms widely used in Malaysia to generalise the research findings better. Moreover, this study assumed the respondents were homogenous, and it did not investigate the possible influence of the different generations, such as the young and older users, or even the influence of the income level, such as the users in the M40 and B40. Therefore, the moderation effect of age, income level or even gender could offer more interesting findings on the behavioural intention to use mobile payment platforms. Furthermore, the difference between Sarawak Pay and other mobile payment platforms is that it is a mobile payment platform owned by the state government. Thus, the possible influence of government-related factors could be included to understand the determinants of the users' behavioural intention and use behaviour of Sarawak Pay.

REFERENCES

Abdullah, N., Redzuan, F., & Daud, N. A. (2020). E-wallet: Factors influencing user acceptance towards cashless society in Malaysia among public universities. *Indonesia Journal of Electrical Engineering and Computer Science, 20*(1), 67-74.

Ajzen, Q. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes, 50*(2), 179-211.

Akbar, F. (2013). *What affected students' acceptance and use of technology? A test of UTAUT in the context of a higher-education institution in Qatar*. (Unpublished senior honors thesis). Information Systems, Dietrich College, Carnegie Mellon University.

Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management, 37*(1), 99-110.

Al-Saedi, K., Al-Emran, M., Ramayah, T., & Abusham, E. (2020). Developing a general extended UTAUT model for M-payment adoption. *Technology in Society, 62*(1), 101293.

Bank Negara Malaysia. (2020). Annual report. https://www.bnm.gov.my/documents/20124/3026128/ar2020_en_book.pdf

Byrne, B. M. (2013). *Structural equation modelling with AMOS: Basic concepts, applications and programming.* Routledge.

Camilleri, M. A. (2020). The online users' perceptions toward electronic government services. *Journal of Information, Communication and Ethics in Society, 18*(2), 221-235.

Chawla, D., & Joshi, H. (2019). Consumer attitude and intention to adopt mobile wallet in India – An empirical study. *International Journal of Bank Marketing, 37*(7), 1590-1618.

Chen, W-C., Chen, C-W, & Chen, W-K. (2019). Drivers of mobile payment acceptance in China: An empirical investigation. *Information, 10*(12), 384-404.

Dahlberg, T., Mallat, N., Ondrus, J., & Zmijewska, A. (2008). Past, present and future of mobile payments research: A literature review. *Electronic Commerce Research and Applications, 7*(2), 165-181.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Diamantopoulos, A., & Siguaw, J. A. (2006). Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *British Journal of Management, 17*(4), 263-282.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research.* Addison-Wesley.

Flavian, C., Guinaliu, M., & Lu, Y. (2020). Mobile payments adoption – Introducing mindfulness to better understand consumer behaviour. *International Journal of Bank Marketing, 38*(7), 1575-1599.

Gao, L., & Bai, X. (2014). A unified perspective on the factors influencing consumer acceptance of internet of things technology. *Asia Pacific Journal of Marketing and Logistics, 26*(2), 211-231.

Gefen, D., Straub, D., & Boudreau, M. C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems, 4*(1), 1-70.

Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. *Journal of Management Information Systems, 18*(1), 185-214.

Gupta, K., & Arora, N. (2020). Investigating consumer intention to accept mobile payment systems through unified theory of acceptance model: An Indian perspective. *South Asian Journal of Business Studies, 9*(1), 88-114.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modelling (PLS-SEM)* (2nd Ed.). Sage.

Hakimi, R. N., Lim, X. J., Cheah, J.-H., Ting, H., Soebandhi, S., Sudiyanti, S., Basha, N. K. (2019). Determinants of consumer attitudes towards mobile advertising: A cross-border study between Malaysia and Indonesia using PLS-MGA. *International Journal of Economics and Management, 13*(1), 21-36.

Hu, L.-T., & Benlter, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Kaur, S., & Arora, S. (2021). Role of perceived risk in online banking and its impact on behavioural intention: Trust as a moderator. *Journal of Asia Business Studies, 15*(1), 1-30.

Kline, R. B. (2011). *Principles and practice of structural equation modelling* (2nd Edition). Guilford Press.

Kuciapski, M. (2017). A model of mobile technologies acceptance for knowledge transfer by employees. *Journal of Knowledge Management, 21*(5), 1053-1076.

Leong, C-M., Tan, K-L., Puah, C-H., & Chong, S-M. (2020). Predicting mobile network operators users m-payment intention. *European Business Review, 33*(1), 104-126.

Liebana-Cabanillas, F., Luna, I. R., & Montoro-Rios, F. (2017). Intention to use new mobile payment systems: A comparative analysis of SMS and NFC payments. *Economic Research-Ekonomska Istrazivanja*, *30*(1), 892-910.

Madan, K., & Yadav, R. (2016). Behavioural intention to adopt mobile wallet: A developing country perspective. *Journal of Indian Business Research, 8*(3), 227-244.

Ooi, K.-B., & Tan, G. W.-H. (2016). Mobile technology acceptance: An investigation using mobile users to explore smartphone credit card. *Expert Systems with Applications, 59*(1), 33-46.

Patil, P., Tamilmani, K., Rana, N. P., & Raghavan, V. (2020). Understanding consumer adoption of mobile payment in India: Extending Meta- UTAUT model with personal innovativeness, anxiety, trust and grievance redressal. *International Journal of Information Management, 54*(1), 102144.

Rondan-Catalunam, F. J., Arenas-Gaitan, J., & Ramirez-Correa, P. E. (2015). A comparison of the different versions of popular technology acceptance models: A non-linear perspective. *Keybernetes, 44*(5), 788-805.

Sankaran, R., & Chakraborty, S. (2021). Factors impacting mobile banking in India: Empirical approach extending UTAUT2 with perceived value and trust. *IIM Kozhikode Society & Management Review, 1*(1), 1-18.

Sarawak Pay. (2020). https://sarawakpay.sarawak.gov.my/page-0-6-14-About-Sarawak-Pay.html

Schierz, P. G., Schilke, O., & Wirtz, B. W. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications, 9*(3), 209-216.

Sharma, S., Singh, G., Pratt, S., & Narayan, J. (2021). Exploring consumer behavior to purchase travel online in Fiji and Solomon Islands? An extension of the UTAUT framework. *International Journal of Culture, Tourism and Hospitality Research, 15*(2), 227- 247.

Slade, E., Williams, M., Dwivedi, Y., & Piercy, N. (2015). Exploring consumer adoption of proximity mobile payments. *Journal of Strategic Marketing, 23*(3), 209-223.

Susanto, P., Hoque, M. E., Hashim, N. M. H. N., Shah, N. U., & Alam, M. N. A. (2020). Moderating effects of perceived risk on the determinants-outcome nexus of e-money behaviour. *International Journal of Emerging Markets, 17*(2), 530-549.

Tang, K. L., Aik, N. C., & Choong, W. L. (2021). A modified UTAUT in the context of m-payment usage intention in Malaysia. *Journal of Applied Structural Equation Modeling, 5*(1), 40-59.

Teng, P. K., Heng, B. L. J., Abdullah, S. I. N. W., Ping, W. T., & Yao, X. J. (2020). Consumer adoption of mobile payments: A distinctive analysis between China and Malaysia. *International Journal of Business Continuity and Risk Management, 10*(2/3), 207-223.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425-478.

Yan, L-Y., Tan, G. W-H., Loh, X-M., Hew, J-J-., & Ooi, K-B. (2021). QR code and mobile payment: The disruptive forces in retail. *Journal of Retailing and Consumer Services, 58*(1), 102300.

APPENDIX

Measurement Items

EFFORT EXPECTANCY

EE1: My interaction with ***Sarawak Pay*** would be clear and understandable.

EE2: It would be easy for me to become skilful at using ***Sarawak Pay***.

EE3: I would find ***Sarawak Pay*** easy to use.

EE4: Learning to operate ***Sarawak Pay*** would be easy for me.

PERFORMANCE EXPECTANCY

PE1: I would find ***Sarawak Pay*** is useful in my daily life.

PE2: Using ***Sarawak Pay*** would enable me to accomplish payment more quickly.

PE3: Using ***Sarawak Pay*** would save my time.

PE4: If I use ***Sarawak Pay***, I will increase my chances of getting a higher quality of service.

ATTITUDE

ATT1: I like the idea of using **Sarawak Pay.**

ATT2: Using ***Sarawak Pay*** is a pleasant experience.

ATT3: Using ***Sarawak Pay*** is a good idea.

ATT4: Using ***Sarawak Pay*** is a wise idea.

SOCIAL INFLUENCE

SI1: People who influence my behaviour think that I should use ***Sarawak Pay***.

SI2: People who are important to me think that I should use ***Sarawak Pay***.

SI3: Using ***Sarawak Pay*** would reflect my personality to others.

SI4: I would use ***Sarawak Pay*** because my friends do so.

*SI5: I will use ***Sarawak Pay*** if the service is widely used by people in society.

FACILITATING CONDITIONS

FC1: I have the resources (e.g. internet access, smartphone etc) necessary to use ***Sarawak Pay***.

FC2: I have the knowledge necessary to use ***Sarawak Pay***.

*FC3: ***Sarawak Pay*** is compatible with other systems I use.

*FC4: A specific person (or group) is available for assistance with ***Sarawak Pay*** difficulties.

BEHAVIOURAL INTENTION

BI1: I intend to increase the use of Sarawak Pay in the future.

BI2: I intend to use ***Sarawak Pay*** when the opportunities arise.

BI3: I would like to use ***Sarawak Pay*** for purchasing instead of traditional payment methods. (e.g. Cash)

BI4: I will strongly recommend to others to use ***Sarawak Pay***.

USE BEHAVIOUR (ACTUAL USE)

UB1: I have used ***Sarawak Pay*** a lot in the past.

UB2: I have been using ***Sarawak Pay*** regularly in the past.

*Items have been deleted due to the low outer loading.