

Use It or Not to Use It? Mobile Wallet Usage Intention Amidst Covid-19 Outbreak among Malaysians

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Abstract

The coronavirus outbreak has necessitated physical distancing to be ruled out as a measure to control the virus transmission. The pandemic has also called forth an alternative among Malaysians to continue their livelihood, including opting for mobile wallets during routine business transactions. Despite the growing number reported during the COVID-19 pandemic, the 40% increase has yet to reach the optimum level of usage, indicating that mobile wallet use will remain relatively low. Therefore, this study seeks to investigate mobile wallet usage amidst the COVID-19 pandemic by using the Technology Acceptance Model (TAM). The present research was conducted nationwide, involving a sample size of 452 who completed the distributed questionnaires. The analysis of data utilised the Smart Partial Least Square (SmartPLS). The results show a significant relationship between perceived usefulness and attitude towards mobile wallet usage. The respondents believe that using mobile wallets would be beneficial to them. In addition, perceived ease of use is also found to be significant, and the respondents believe that they do not require much effort to use a mobile wallet. The attitudes towards using mobile wallets have also observed a significant relationship with the intention of Malaysians to use them. For future research, it is recommended that the study is conducted with larger sample size and that the integration of a qualitative approach is considered to better understand the usage of mobile wallets in a similar context.

Keywords: mobile wallet, perceived usefulness, perceived ease of use, attitude towards mobile wallet usage, intention to use mobile wallet

1.0 Introduction

The coronavirus is identified as the cause of COVID-19. This outbreak has taken the world by storm, which is manifested through breathing difficulties and the cessation of respiratory functions. The first population identified to be exposed was assumed to come from a large market carrying seafood and animal in Wuhan, China, wherein these patients were suspected of contracting the coronavirus through the animal-to-person spread. However, as the number of patients multiplied, it was found that most of them did not have a prior link to such a market, which then implied that person-to-person transmission happened. At this juncture, the mechanism for the spread of coronavirus remained unclear despite the massive number of patients increasing each day.

Physical distancing, a measure to control the virus transmission, was ruled out. This immediate response has effectively lowered the number of reported cases during the global outbreak by 13 per cent. In a study, Ather et al. (2020) explicate the coronavirus to be transmitted when inanimate objects are contaminated with respiratory droplets of an infected individual, which then contact other individuals. An instance of such transmission is made possible through physical money. Thus, the World Health Organisation (WHO) proposes the shift to using digital money during business transactions whenever possible (Brown, 2020).

As the pandemic altered the global economic landscape, Malaysia inevitably experienced turbulence. For instance, many local industries and small business owners downsized or even shut their businesses down. The Malaysian government responded to the turmoil by introducing the Economic Stimulus Package 2020, worth RM20 billion. This step was taken to address the economic risks imposed by the outbreak and, in the meantime, gradually remedied those affected, albeit minimal in comparison to the loss incurred. The second wave of financial assistance was through the PRIHATIN Rakyat Economic Stimulus Package (RM250 billion), which also targeted strengthening the local economies, on top of the RM10 billion allocation for SMEs business makers. Besides, the Prime Minister of Malaysia, Tan Sri Muhyiddin Yassin, also announced a National Economic Recovery Plan (PENJANA) to recultivate the local economy by encouraging the general public to spend their money within the boundary of the country. One of the examples included the RM50 incentive for Malaysians, which was credited to selected accounts with a mobile wallet function.

Through this RM750 million initiative, 15 million countrymen were estimated to be benefitted.

Despite the small percentage of mobile wallet users reported by PwC Research Analysis (2018) and a study done by See and Goh (2020), this initial figure of 22 per cent of existing users of mobile wallets has significantly increased throughout the pandemic. To illustrate, Malaysia was found to surpass other countries, within the South East Asian region, in terms of mobile wallet usage (The Mastercard Impact Study, 2020). Leading at 40 per cent, Malaysia was placed first, followed by the Philippines (36 %), Thailand (27 %), and Singapore (26 %). These figures were generated from 10,000 consumers and business professionals coming from ten markets across the Asia Pacific. Subsequently, these results also indicate the need to swiftly adopt the concept of e-commerce and cashless payments solutions alongside existing online activities to move the digital economy in South East Asia, primarily due to the movement restrictions. Nonetheless, these statistics did not represent the composition of the whole population as it was only the average for all Malaysians.

The findings on studies of cashless payment usage and mobile wallets, in particular, have presented varying insights into the matter. These include the concern of *riba* (interest or usury), which is against the teaching of Islam and thus has dramatically influenced consumers' intention (Aji et al., 2020), apart from risks and uncertainties posed by mobile transactions such as theft or fraud (Che Nawi et al., 2021; Bagla & Sancheti, 2018; Leong et al., 2020), as well as breaching of data (Marria, 2018). Shin (2009) adds that customer apathy hinders mobile wallets' adoption among Malaysian users. Similarly, Mittal and Kumar (2018) also note the discomfort caused by the system, which then causes consumers to be reluctant to attempt making payments via mobile devices. Considering the growing enthusiasm and potential to be observed through the adoption of mobile wallet service, the possible threats entailed are not negligible. Hence, this present study seeks to investigate the factors influencing the intention to use mobile wallets amidst the COVID-19 pandemic in Malaysia. In addition, this paper uses the Technology Acceptance Model (TAM) to investigate the intention to use mobile wallets during the COVID-19 pandemic in Malaysia. Past studies have shown that TAM is extensively used in technological adoption research at the individual level.

2.0 Literature Review

A multitude of research has reported the varying effects of SARS-Cov2 spread over the past year – how the outbreak has been lethal to both human beings and businesses (Turner and Akinremi, 2020; Ivanov, 2020), the continuing financial and economic downturns (Goodell, 2020), as well as activities across all sectors (Nicola, Alsafi, Sohrabi, Kerwan, Al-Jabir, Iosifidis, ... & Agha, 2020). Fan, Jamison, and Summers (2018) predict the occurrence of global loss at a large scale following epidemic and pandemic situations. Truth be known, the novel coronavirus outbreak has proven COVID-19 to alter consumer behaviours in the context of Asian countries, including Malaysia.

Consumers thriving under the ongoing pandemic have opted for contactless transactions due to the movement constraints decreed in the physical distancing and self-quarantine policies. This includes routine purchases of groceries, household necessities, and other goods that were previously done in physical stores. In return, the delivery companies in Malaysia observed a 30 per cent increase following the surge in the total number of orders since 18 March 2020 when the Movement Control Order (MCO) was legislated nationwide. Such change in the trend of doing transactions has led many retailers, transportation providers, and food merchants to embrace cashless payment solutions in their business activities, thus encouraging the consumers also to use digital wallets.

A mobile wallet is a payment method that allows consumers to pay with their mobile smartphone. The objectives of mobile wallets are to give ease and security (Singh & Rana, 2017). In Malaysia, the acceptance rate of mobile wallets was 22 per cent in 2018 (PwC Research Analysis (2018)). With the introduction of the Movement Control Order (MCO) in 2020, mobile wallets usage increased to 62 per cent, as the epidemic triggered various reasons that accelerated the adoption of mobile wallets in Malaysia. However, in 2020, the number of people using mobile wallets had dropped to 56 per cent due to various reasons including some people who may still be hesitant to utilise mobile wallets.

Therefore, this has necessitated the understanding of the adoption of digital wallets among consumers. To do so, the Technology Acceptance Model (TAM) proposed by Davis (1986), which stemmed from the Theory of Reasoned Action (TRA) developed by Ajzen and Fishbein (1980), was employed to explain the phenomenon. Generally, this research framework informs the acceptability of individuals with

regards to measuring their behaviour upon using a new information system. This prediction entails the attitude and perception that they have formed is based on others' beliefs as they decide whether to act voluntarily or not. A great deal of existing literature has attested to the suitability of the TAM model to gauge the adoption of e-commerce, thus making it a given for this present study to incorporate the model as part of the theoretical framework. Likewise, the existing variables in TAM, that are (i) perceived ease of use and (ii) perceived usefulness, is retained in the research model of this study.

These variables, which have been used in several past studies. For instance, Sam and Sharma (2015), Wu and Ke (2015), as well as Kim and Song (2010) report how perceived ease of use and perceived usefulness positively impact virtual shopping. Wu and Ke (2015) contribute to the definitions of both variables. The researchers explicate perceived ease of use to reflect the level of belief about utilising a specific technology does not require any additional effort. On the other hand, they define perceived usefulness to depict the level of belief one has, about how using a specific tool or device shall aid him or her in boosting their performance.

2.1 Perceived Ease of Use

The definition of perceived ease of use by Davis (1989) concurs with that of Wu and Ke (2015) as he also proposes the 'free of effort' approach when an individual uses a specific information system. This variable is one of the significant determinants for examining purchase intention (Wei, Marthandan, Chong, Ooi, & Arumugam, 2009), as confirmed by various empirical studies previously (Lee, Fiore, & Kim, 2006; Cho & Fiorito, 2009).

Meanwhile, the fast-paced virtual shopping realm also highlights perceived ease of use as a significant factor. As much as the outcomes of virtual shopping are deemed beneficial, the daunting experience in terms of its usage is not negligible. For instance, consumers who regard the interface when using a website platform to be a hassle are likely to apprehend themselves to continue using the new information system. However, such perceived ease of use may be transformed upon the realisation that benefits outweigh the aggravating procedure they went through initially. The perceived ease of use concerns how user-friendly a platform or information system can be. This kind of association will determine the preferences of virtual shopping users –

to pull through and complete the transactions or back out and opt for conventional purchases.

2.2 Attitude towards Use

As one of the variables, attitude has long been debated in marketing research since the 1960s. The underlying reason for such interest in this variable owes to the explanation by Fishbein and Ajzen (1976), as well as Hoyer and MacInnis (1997), in which these researchers regard attitude to be 'enduring, stable, and widely used' as a concept to gauge the actions of an individual. Meanwhile, attitude is also seen as one's tendency towards formulating choices – whether we like something or not (Severin and Tankard, 2001). This variable is assessed from three angles, namely, behavioural, cognitive, and affective. Firstly, the behavioural aspect of attitude concerns the actions we perform towards a specific object. Secondly, the cognitive aspect of attitude reflects the trust we have towards a specific object. Thirdly, the affective aspect of attitude depicts the preference we show towards a specific object. The existing literature has discussed this variable across varying research settings, including attitude towards advertisers (Lutz, MacKenzie & Belch, 1983) and attitude towards advertisements and brands (Goldsmith, Lafferty & Newell, 2000). Based on those concepts, it can be inferred that one's attitude towards a specific object influences a consumer's point of view when deciding on another object (Hoyer and MacInnis, 1997).

2.3 Intention to Use

The dependence on virtual technologies has encompassed a broad array of contexts, including various industries such as automotive, real estate, scientific visualisation, and even house building. These sectors have also reported a great deal of success as the integration of virtual technologies enables opportunities to innovate and, in the meantime, aids the manufacturers with their decision-making process. This positive evolvement following the ever-changing technological advancement does not only address the limitations of those industries in the past but also stands a unique chance to enhance the educational sector (Akbulut, Akhan, Catal, Cagatay & Yıldız, Burak, 2018). Looking at how virtual technologies have facilitated many growth-related goals to be achieved, the information system joins the bandwagon by studying consumers' intentions. Hung, Ku, and Chang

(2003) describe that this take of analysing how users perceive the use of virtual platforms is rooted in Davis' (1989) Technology Accepted Model (TAM). Additionally, culture is also identified to play a significant role in discussing users' acceptance and adoption of technological advances.

3.0 Methodology

This study employed an empirical approach as the data were gathered through the random distribution of self-administered questionnaires over one month to Malaysian respondents who had not used mobile wallets in their daily lives. Oppotus's (2021) report shows that higher mobile wallet usage can be seen among T20 groups, and in terms of ethnicity, the adoption among the Chinese is higher than in other races. Thus, it is essential to study the intention to use mobile wallets among Malaysians who do not have experience using it.

452 questionnaires were completed and received afterward, which were then analyzed further. Besides, the present research also utilised the 5-point Likert scale, ranging from strongly disagree to agree strongly. The assessment of both measurement and structural models was done via SmartPLS Version 3.

Average variance extracted (AVE) was calculated in the first model (measurement) to gauge the convergent validity. On the other hand, composite reliability (CR) was indicated using Cronbach's Alpha value. The second model (structural) observed the relationship between latent variables in the research model. This assessment was made possible due to three factors – firstly, the R² (coefficient of determination), secondly, the Q² (cross-validated redundancy), and lastly, the path coefficients (Hair, Sarstedt, Hopkins & Kuppelwieser, 2014). Descriptive statistics were also employed to assess the profile of the respondents.

4.0 Findings

Demographically, this study comprises 31.3 per cent male and 68.7 per cent female. This sample was categorised based on race, in which 98.0 per cent was Malays, 1.1 per cent was Chinese, and 0.9 per cent belonged to others. They were also grouped according to their age – 18 years old and below (2.0 %), 19 to 30 years old (66.1 %), 31 to 40 years old (22.4 %), 41 to 50 years old (7.8 %), as well as 51 years old and above (1.8 %). Their academic qualification was considered.

The breakdown included 9.3 per cent at SPM level, 41.0 per cent at the diploma level, 33.9 per cent at the bachelor's degree level, and 15.7 per cent at the postgraduate level. Besides, 23.7 per cent of the population were government servants, 18.0 per cent belonged to the private sector, 6.4 per cent were self-employed, 45.2 per cent were students, and 6.7 per cent were unemployed. The breakdown of income was as follows: RM1,000 and below (53.0 %); RM1,001 – RM3,000 (12.9%); RM3,001 – RM6,000 (20.2 %); RM6,001 – RM10,000 (12.6 %); RM10,001 and above (1.3 %).

According to Pallant (2020), normality is presented by a symmetrical bell-shaped curve in which the most significant frequency of scores is positioned in the middle while the two extremes on both ends constitute the smaller frequencies. Table 1 describes the results of the normality test. The accepted skewness and kurtosis values range from -3 to +3 (George and Mallery, 1999). Based on the results, the data was deduced to be normally distributed.

Table 1 : Descriptive Statistics

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Perceived Usefulness	-.132	.115	-.381	.229
Perceived Ease of Use	-.318	.115	-.507	.229
Attitude towards Mobile Wallet Usage	-.252	.115	-.635	.229
Intention to Use Mobile Wallet	-.350	.115	-.335	.229

4.1 Measurement Model

Factor loading, average variance extracted (AVE), and composite reliability (CR) enable the convergent validity to be examined, which in turn leads to the quality of the measurement model being assessed (Hair, Ringle, and Sarstedt, 2011). Meanwhile, Hair, Black, Babin, and Anderson (2009) posit that the indicator loading for the items is 0.5, whereby the results presented in Table 2 below suggest that all items exceeded the (0.5) value recommended. The figures indicate AVE to be in the range between 0.614 to 0.787 (>0.5), while CA ranges between 0.845 to 0.932 (>0.7), and CR falls between 0.888 to 0.949 (>0.7) (Hair et al., 2009).

Table 2 : Measurement Model Result

Construct	Items	Loadings	CR	AVE	CA
Perceived Usefulness	SA1	0.787	0.888	0.614	0.845
	SA2	0.723			
	SA3	0.786			
	SA4	0.802			
	SA5	0.817			
Perceived Ease of Use	SB1	0.839	0.911	0.673	0.877
	SB2	0.754			
	SB3	0.863			
	SB4	0.866			
	SB5	0.772			
Attitude towards Mobile Wallet Usage	SC1	0.880	0.944	0.771	0.925
	SC2	0.910			
	SC3	0.882			
	SC4	0.913			
	SC5	0.799			
Intention to Use Mobile Wallet	SD1	0.877	0.949	0.787	0.932
	SD2	0.886			
	SD3	0.908			
	SD4	0.870			
	SD5	0.893			

CR=Composite Reliability, AVE=Average Variance Extracted, CA=Cronbach's Alpha

The test for discriminant validity using the square root of the average variance extracted (AVE) for each construct to be greater than the correlation between the constructs has been commonly practised by Fornell and Larcker (1981), yet Henseler et al. (2015) suggest otherwise. Researchers criticise Fornell and Larcker's (1982) approach by lamenting that their methods fail to scrutinise and validate the issue of discriminant validity entirely. Therefore, Henseler et al. (2015) counter-argued discriminant validity assessment by proposing a multitrait-multimethod matrix, which is the heterotrait-monotrait (HTMT) ratio of correlations, as a more rigorous method of achieving the results. This HTMT serves as a criterion that involves comparing a predefined threshold, albeit the values differ – 0.85 (Kline, 2011) and 0.90 (Gold, Malhotra, and Segars, 2001) before a claim on the lack of discrimination validity can be made. Table 3 below indicates the discriminant validity to fulfil the proposed threshold.

Table 3 : Heterotrait-Monotrait Ratio

	PU	PEoU	Attitude	Intention
Perceived Usefulness				
Perceived Ease of Use	0.853			
Attitude towards Mobile Wallet Usage	0.838	0.873		
Intention to Use Mobile Wallet	0.796	0.834	0.903	

4.2 Assessment of Predictive Relevance

The structural model was evaluated through path analysis. The several criteria outlined by Hair et al. (2011) for evaluating the structural model primarily include the R2 values and the level of significance of the path coefficients. On the other hand, Cohen (1988) emphasise that the value of R2 should exceed 0.26 of the endogenous latent variable for a model to be considered reasonable. Figure 1 shows R2 to be at 0.705, indicating the perceived usefulness, ease of use, and attitude towards the use of mobile wallets accounted for 70.5 per cent of the variance in the intention to use mobile wallets.

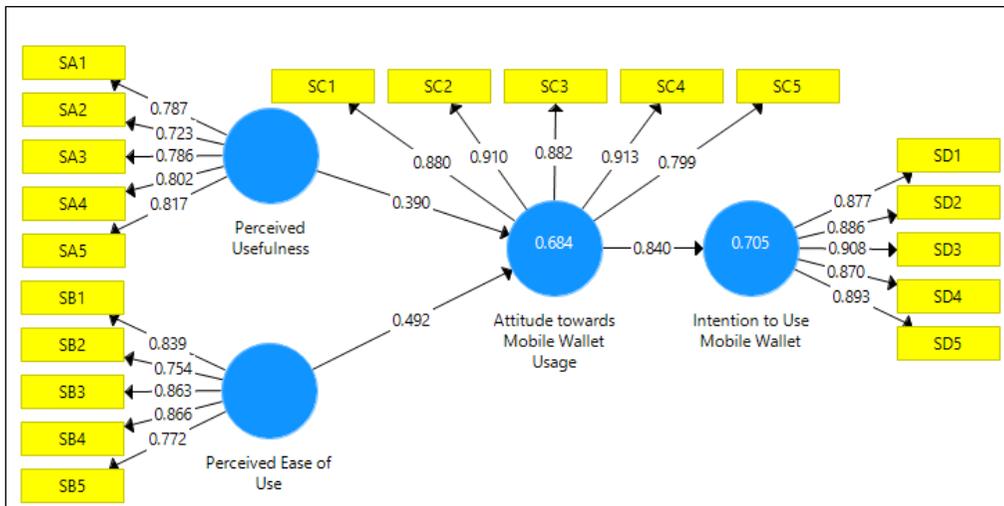


Figure 1 : Result of Path Analysis

Apart from R2, predictive relevance (Q2) is another approach to evaluating the structural model. According to Hair et al. (2011) and Chin (2010), predictive relevance demonstrates how the values observed are rebuilt by the model and how its parameters are estimated. Additionally, a blindfolding technique is proposed to obtain the values

of Q2 (Ringle et al., 2005). Table 4 presents the cross-validated redundancy values obtained for the intention to use a mobile wallet at 0.0253, confirming the model to have sufficient prediction quality.

Table 4 : Predictive Relevance of the Model

	SSO	SSE	Q ² (=1-SSE/SSO)
Intention to Use Mobile Wallets	1,215.046	1,184.237	0.0253

4.3 Assessment of Structural Model

Analysis of the inner model was carried out to test the structural model once the measurement model was examined. Using the PLS approach, the hypotheses for this study were tested through the assessment of path coefficient (β) via structural equation modelling, as presented in Table 5.

Table 5 : Indirect Path Analysis

	IV	DV	beta	t value	p-values	LL	UL	Result
H1	PU	Attitude	0.045	8.603	0.000*	0.296	0.469	Supported
H2	PEoU	Attitude	0.048	10.216	0.000*	0.399	0.588	Supported
H3	Attitude	Intention	0.023	36.377	0.000*	0.796	0.884	Supported

*Significant at $p < 0.05$. IV=Independent Variable, DV=Dependent Variable, PU=Perceived Usefulness, PEoU=Perceived Ease of Use, Attitude=Attitude towards Mobile Wallet Usage, Intention=Intention to Use Mobile Wallets

For H1, the result showed that p -values were at 0.000 with β -values at 0.045 and t -values at 8.603. This was supported by the values of Bootstrap CI: [LL = 0.296, UL = 0.469], which did not straddle zero in between, suggesting that perceived usefulness had a significant relationship with attitude towards mobile wallet usage. Meanwhile, for H2, the result showed that p -values were at 0.000 with β -values at 0.048 and t -values at 10.216. This was supported by the values of Bootstrap CI: [LL = 0.399, UL = 0.588], which did not straddle zero in between hence indicating that perceived ease of use had a significant relationship between attitude and mobile wallet usage. For H3, the result showed that p -values were at 0.000 with β -values at 0.023 and t -values at 36.377. This was supported by the values of Bootstrap CI: [LL = 0.796, UL = 0.884], which did not straddle zero in between, implying that attitude towards mobile wallet usage had a significant relationship with the intention to use a mobile wallet.

The purpose of this study was to use a technological acceptance model to investigate Malaysian intentions to use mobile wallets. The study also looked at the attitude towards mobile wallet usage and how that affected their intention to use mobile wallets. Perceived usefulness and perceived ease of use are important factors to consider when examining attitude towards mobile wallet usage. The current study supports the findings of a previous study which reveals that a consumer's attitude towards mobile wallet usage has a significant impact on their intention to use a mobile wallet (Barry and Jan, 2018; Al-Marouf and Al-Emran, 2018; Davis, 1989). Perceived usefulness significantly impacts attitudes towards mobile wallet usage because using a mobile wallet saves time and makes it easier to make any payment. As a result, the findings from this study are consistent with those of a previous study (Baker-Eveleth and Stone, 2015). Furthermore, perceived ease of use is found to have a significant relationship with attitudes towards the use of mobile wallets. The more convenient a mobile wallet is to use, the more people would use it, according to the findings of a recent study by Venkatesh et al. (2000). As a result, mobile wallet providers must keep in mind that user-friendly applications may positively impact consumers' attitudes about mobile wallet usage. It is discovered that consumers' attitude towards using a mobile wallet has considerably impacted their intention to utilise it. As a result, it is critical to ensure that customers have a positive attitude before considering using a mobile wallet, as evidenced by Patil, Tamilmani, Rana, and Raghavan (2020).

5.0 Conclusion and Recommendations

Mobile wallet has come into existence thanks to the booming of information technology. Farida, Ardyan, and Nuryakin (2016) sum up the underlying reason for such ultra-rapid development to be the demand for a practical system in society. To illustrate, the people of this current generation prefer to carry little to no cash, as their routine transactions are now made feasible via smartphones or cards. This phenomenon has sparked interest among researchers to study mobile wallet usage following the enforcement of social distancing due to the ongoing COVID-19 outbreak.

While many have enjoyed the perks of incorporating mobile wallets into their daily lives, others still see this transformation otherwise. The gap mentioned must be addressed despite the attested convenience, benefits, and security when using this mobile wallet.

Thus, the technology acceptance model (TAM), an information technology model which measures the ease of use and usefulness of a specific information system, is one of the theories befitting to examine the phenomenon. The findings of this study present that all independent variables have a significant relationship with the dependent variable. Thus, this implies that the attitude and intention of Malaysians to use the mobile wallet is on the rise following the ongoing COVID-19 pandemic. Similarly, this indicates support from the general public to align with the social distancing policy legislated by the Malaysian government. The finding is essential to the policymaker in developing the guidelines for mobile usage.

This present study has noted its limitations, which necessitate further research in the future. As this research discusses the development of the TAM model, this increases the likelihood of the interest level in using a new system to be affected. Besides, the theory and conditions in the field of this study are yet to be deemed entirely compatible. Nonetheless, the research on cashless payment solutions is garnering more interest since more developments are already foreseen. Thus, the future undertaking on this research topic should ensure that the selected respondents are demographically suitable with the predetermined criteria, wherein they are the existing and regular mobile users. Additionally, employing an interview method also serves as a good preliminary step.

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References

Agrawal, A. K., & Mittal, G. K. (2018). The role of ICT in higher education for the 21st century: ICT as a change agent for education. *Multidisciplinary Higher Education, Research, Dynamics & Concepts: Opportunities & Challenges for Sustainable Development* (ISBN 978-93-87662-12-4), 1(1), 76-83.

- Aji, H. M., Berakon, I., & Husin, M. M. (2020). COVID-19 and e-wallet usage intention: A multigroup analysis between Indonesia and Malaysia. *Cogent Business & Management*, 7(1), 1804181.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Akbulut, A., Catal, C., & Yıldız, B. (2018). On the effectiveness of virtual reality in the education of software engineering. *Computer Applications in Engineering Education*, 26(4), 918-927.
- Al-Marroof, R. A. S., & Al-Emran, M. (2018). Students acceptance of Google classroom: An exploratory study using PLS-SEM approach. *International Journal of Emerging Technologies in Learning*, 13(6)
- Ather, A., Patel, B., Ruparel, N. B., Diogenes, A., & Hargreaves, K. M. (2020). Coronavirus disease 19 (COVID-19): implications for clinical dental care. *Journal of endodontics*, 46(5), 584-595.
- Bagla, R. K., & Sancheti, V. (2018). Gaps in customer satisfaction with digital wallets: a challenge for sustainability. *Journal of Management Development*.
- Baker-Eveleth, L., & Stone, R. W. (2015). Usability, expectation, confirmation, and continuance intentions to use electronic textbooks. *Behaviour & Information Technology*, 34(10), 992–1004.
- Barry, M., & Jan, M. T. (2018). Factors influencing the use of m-commerce: An extended technology acceptance model perspective. *International Journal of Economics, Management, and Accounting*, 26(1), 157-183.
- Brown, W. (2020). *States of injury: Power and freedom in late modernity*. Princeton University Press.
- Chin, W. W. (2010). How to write up and report PLS analyses. In *Handbook of partial least squares* (pp. 655-690). Springer, Berlin, Heidelberg.
- Cho, H., & Fiorito, S. S. (2009). Acceptance of online customization for apparel shopping. *International Journal of Retail & Distribution Management*.
- Cohen, S. (1988). *Perceived stress in a probability sample of the United States*.
- Davis, F. D. (1986). *Technology acceptance model for empirically testing new end-user information systems: Theory and results*. MA, USA: Massachusetts Institute of Technology.
- Davis, F. D. (1989). "Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology," *MIS Quarterly* 13(3), 319-339.

- Fan, V. Y., Jamison, D. T., & Summers, L. H. (2018). Pandemic risk: how large are the expected losses?. *Bulletin of the World Health Organization*, 96(2), 129.
- Farida, N., Ardyan, E., & Nuryakin, N. (2016). Gender differences in interest in using electronic money: an application of theory planned behavior. *International Review of Management and Marketing*, 6(4).
- Fishbein, M., & Ajzen, I. (1976). Misconceptions about the Fishbein model: Reflections on a study by Songer-Nocks. *Journal of Experimental Social Psychology*, 12(6), 579-584.
- Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics.
- George, D., & Mallery, P. (1999). *SPSS for WINDOWS step by step*. Boston: Allyn & Bacon.
- Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. *Journal of management information systems*, 18(1), 185-214.
- Goldsmith, R. E., Lafferty, B. A., & Newell, S. J. (2000). The impact of corporate credibility and celebrity credibility on consumer reaction to advertisements and brands. *Journal of advertising*, 29(3), 43-54.
- Goodell, J. W. (2020). COVID-19 and finance: Agendas for future research. *Finance Research Letters*, 35, 101512.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). *Análise multivariada de dados*. Bookman editora.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-152.
- Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European business review*.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, 43(1), 115-135.
- Horton, R.P., Buck, T., Waterson, P.E. & Clegg, C.W. (2001). Explaining Intranet Use the Technology Acceptance Model, *Journal of Information Technology*, 14, 237-49.
- Hoyer Wayne D & MacInnis Deborah (1997). *Consumer behavior*. Boston' Houghton Mifflin;

- Hung, S. Y., Ku, C. Y., & Chang, C. M. (2003). Critical factors of WAP services adoption: an empirical study. *Electronic commerce research and applications*, 2(1), 42-60.
- Ivanov, D. (2020). Predicting the impacts of epidemic outbreaks on global supply chains: A simulation-based analysis on the coronavirus outbreak (COVID-19/SARS-CoV-2) case. *Transportation Research Part E: Logistics and Transportation Review*, 136, 101922.
- Kim, H., & Song, J. (2010). The quality of word-of-mouth in the online shopping mall. *Journal of Research in Interactive Marketing*.
- Kline, R. B. (2011). *Principles and practice of structural equation modeling*. New York: Guilford Press. Teo, T. S. H
- Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behavior. *Information systems research*, 13(2), 205-223.
- Lee, H. H., Fiore, A. M., & Kim, J. (2006). The role of the technology acceptance model in explaining the effects of image interactivity technology on consumer responses. *International Journal of Retail & Distribution Management*.
- Leong, C. M., Tan, K. L., Pua, C. H., & Chong, S. M. (2020). Predicting mobile network operators' user's m-payment intention. *European Business Review*.
- Lutz, R. J., MacKenzie, S. B., & Belch, G. E. (1983). Attitude toward the ad as a mediator of advertising effectiveness: Determinants and consequences. *ACR North American Advances*.
- Marria, V. (2018). Is Artificial Intelligence Replacing Jobs in Banking? Retrieved March 10th, 2021, from <https://www.forbes.com/sites/vishalmarria/2018/09/26/is-artificial-intelligence-replacing-jobs-inbanking>
- Moon, J. W., & Kim, Y. G. (2001). Extending the TAM for a World-Wide-Web context. *Information & management*, 38(4), 217-230.
- Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., ... & Agha, R. (2020). The socio-economic implications of the coronavirus and COVID-19 pandemic: a review. *International journal of surgery*.
- Oppotus (2021). Malaysian E-Wallet Usage as We Move Towards Recovery. <https://www.oppotus.com/malaysian-e-wallet-usage-towards-recovery-2021/#:~:text=Towards%20the%20end%20of%202020,%2Dtime%20peak%20of%2067%25>.

- Pallant, J. (2020). *SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS*. Routledge.
- 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, 102144.
- PwC Research Analysis (2018). Retrieved March 12th, 2021, from <https://www.pwc.com/my/en/assets/blog/pwc-my-deals-strategy-banking-on-the-ewallet-in-malaysia.pdf>
- Ringle, C. M. (2005). *SmartPLS 2.0 (M3)*. <http://www.smartpls.de>.
- Sam, C. Y., & Sharma, C. (2015). An Exploration into the Factors Driving Consumers in Singapore towards or away from the Adoption of Online Shopping. *Global Business & Management Research*, 7(1).
- See, S. F., & Goh, Y. N. (2020). Factors affecting restaurant customer intention to adopt mobile payment. *Malaysian Journal of Consumer and Family Economics.*, 25, 62-91.
- Severin, W. J., & Tankard, J. W. JR. (2001). *Communication Theories: Origins, Methods, and Uses in the Mass Media*.
- Shin, D. H. (2009). Towards an understanding of the consumer acceptance of mobile wallets. *Computers in Human Behavior*, 25(6), 1343-1354.
- Singh, S., & Rana, R. (2017). Study of consumer perception of digital payment mode. *Journal of Internet Banking and Commerce*, 22(3), 1-14.
- Turner, J., & Akinremi, T. (2020). *The business effects of pandemics—A rapid literature review*. Enterprise Research Centre.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186-204.
- Wei, T. T., Marthandan, G., Chong, A. Y. L., Ooi, K. B., & Arumugam, S. (2009). What drives Malaysian m-commerce adoption? An empirical analysis. *Industrial management & data systems*.
- Wu, W. Y., & Ke, C. C. (2015). An online shopping behavior model integrating personality traits, perceived risk, and technology acceptance. *Social Behavior and Personality: an international journal*, 43(1), 85-97.