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Technology Acceptance Model to Unveil Factors Affecting E-Business Adoption: A Small and Medium Enterprise Perspective

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Abstract:

An E-Business platform is a vital tool that provides SMEs with a platform to turn their traditional business into an advanced business model. Due to the rapid development of the Internet, there has been an interest in how to encourage the owner or manager of SMEs in Sarawak. In particular, the purpose of this paper is to investigate SMEs' behavioral intention of adopting an e-business platform to focus on the perceptions of the users in terms of usefulness, ease of use, and enjoyment of attitude toward e-business. The questionnaire on e-business adoption was specifically designed and used to survey a purposive sample of SMEs from Sarawak, Malaysia, and 228 testable responses were obtained. The data were analyzed using Statistical Package for the Social Sciences (SPSS) 26.0 and Smart Partial Least Squares (SmartPLS) 3.0. The result indicates that ease-of-use and enjoyment have a significant positive relationship with attitude, whereas the usefulness has no significant relationship with attitude. Besides, SMEs' attitude also significantly influences e-business adoption. This study provides novel insights into the factors influencing the e-business adoption among Sarawak SMEs, highlighting the importance of ease-of-use and enjoyment in shaping attitudes toward e-business. This finding extended the current understanding of e-business adoption by Sarawak SMEs. The implications, limitations, and conclusions of the study are outlined.

Keywords: e-business adoption, perceived ease of use, perceived enjoyment, perceived usefulness, technology acceptance model, small and medium enterprises, Malaysia.

揭示影响电子商务采用的因素的技术接受模型：中小企业的视角

摘要：

电子商务平台是一个重要的工具，它为中小企业提供一个平台，将他们的传统业务转变为先进的商业模式

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。由于互联网的快速发展，人们对如何鼓励砂拉越中小型企业的所有者或经理产生了兴趣。特别是，本文的目的是调查中小企业采用电子商务平台的行为意图，重点关注用户对电子商务的有用性、易用性和享受态度的看法。关于电子商务采用的问卷是专门设计的，用于调查来自马来西亚砂拉越的中小企业的有目的样本，并获得了228个可测试的答复。使用社会科学统计包26.0和智能偏最小二乘法3.0分析数据。结果表明，易用性和乐趣与态度有显著的正相关关系，而有用性与态度没有显著关系。此外，中小企业的态度也显著影响电子商务的采用。这项研究对影响砂拉越中小企业采用电子商务的因素提供了新颖的见解，强调了易用性和乐趣在塑造电子商务态度方面的重要性。这一发现扩展了目前对砂拉越中小企业采用电子商务的理解。概述了研究的意义、局限性和结论。

关键词：电子商务采用、感知的易用性、感知享受、感知有用性、技术接受模式、中小企业、马来西亚。

1. Introduction

Small and medium enterprises (SMEs) are a significant economic stimulant for countries. Equally, they frequently lack a nationwide presence and cannot provide instant services 24 hours a day. Using electronic business (e-business) technology has solved these issues, allowing SMEs to enter larger markets without being physically present, increasing productivity, and improving communication with business stakeholders. SMEs in Sarawak account for 6.7 percent of the country's overall economic distribution. The Premier of Sarawak, Datuk Patinggi Abang Abdul Rahman Zohari bin Tun Abang Haji Openg, announced during the start of the Business Excellence Seminar and Forum 2017, "Sarawak is on the right path to achieving its goal to become a developed state with the inception of several initiatives to enhance the state's potential in the digital economy" (New Straits Times, 2017). According to the statement, the state government encourages SMEs to integrate technology into their operations.

Nonetheless, SMEs in emerging nations such as Malaysia have not fully embraced technological advancement to expand their operations outside the conventional market. Furthermore, there is a need to better understand the factors of e-business adoption, which may be connected to perceptions of e-business adoption in SMEs. Several decisions made by SMEs are influenced by the attitude of the enterprise's owner or management. Recognizing opportunities is the consequence of the owner or manager's good business purpose and action, which is motivated by the belief that the owner or manager can produce the desired results. In general, creative response refers to an owner's or manager's answer that goes beyond the scope of established practice (Schumpeter, 1947), which is affected by a quality decision and the behavior of social performers (Alam et al., 2018).

In this study, e-business adoption is a creative response to SMEs since it goes beyond the previous practices of the sampled SMEs. The adoption intention is influenced by the business owner's or manager's understanding and the qualities that impact the adoption of e-business technology. Although e-business offers numerous benefits for SMEs, it might be argued that technology adoption in business is intimately connected

to managerial capabilities, and perception affects e-business adoption and usage (Rokhim et al., 2018). Specifically, this research attempts to examine the influence of perceived usefulness, perceived ease-of-use, and perceived enjoyment has a positive influence on attitude toward adoption which directly predicts e-business adoption in SMEs as well as to investigate the influence of attitude toward adoption has a positive effect on behavior intention to adopt the e-business in SMEs.

2. Theoretical Foundations and Development of Hypotheses

2.1. E-Business Adoption

The adoption of e-business by SMEs has increased the competitive advantage for modern companies (Omar et al., 2015). Meanwhile, SMEs with unique characteristics help businesses compete with larger companies by adopting modern technologies in their 21 business operations. The dynamic organizational nature of SMEs made it easier for them to easily adopt modern technologies (Al Rahbi, 2017). SMEs are known to be more flexible in quickly adapting to new changes, with better development and acceptance of new ideas than large organizations (Abdullah et al., 2013). Thus, the adoption of e-business among SMEs is investigated in this study. The operational and strategic decisions in SMEs could be made by the owners or managers of the company. SME owners or managers were often responsive to the establishment of e-business goals and determined the potential of e-business in their company (Rahayu & Day, 2017). Due to these characteristics of SMEs, the introduction of e-business became more important to respond to the rapid growth of the country (Al Rahbi, 2017). The Ministry of Information and Communication Technology of Thailand conducted training programs to develop the business capability of SMEs and to ensure that they are able to compete in the modern world (Wangkhamdi et al., 2020). This emphasized that the development of SMEs is significant to a country's economic growth. Hence, the decision made by the owners or SME managers to adopt or not adopt the e-business platform is important to be known.

2.2. Technology Acceptance Model (TAM)

As technology changes continuously on the Internet, many extensions of the Technology Acceptance Model (TAM) have been proposed. TAM is a well-established, prudent, and influential model (Ahmad et al., 2014) that was developed by Davis (1985). It explained users' adoption toward technology in the organization (Lai, 2017). Based on Taylor and Todd (1995) and Davis (1989), TAM proposed perceived usefulness and perceived ease-of-use as two major determinants of systemic use in an organisation. System designers had some degree of control over these two factors. In TAM, perceived usefulness was defined as the degree to which a person perceived the potential improvement in his or her job performance from using a particular system (Liu, 2016). Meanwhile, the perceived ease-of-use was the personal belief that using a particular system required no physical or mental effort (Zhou & Feng, 2017). Besides, TAM implied that attitude was based on the belief of users and consequences for a given behavior (Lopez-Bonilla & Lopez-Bonilla, 2016). Eventually, Davis (1985) further argued that attitude was the greatest aspect of intention to use and added descriptive power to the intention of an individual to use a specific information system (Bugembe, 2010) or technological platform. Behavioral intention measured the subjective probability of a person in a specific behaviour, such as e-business adoption, so the behavioral intention was also measured in this study.

Several studies were conducted to replicate and extend the TAM to determine the factors affecting the organisation's adoption of technology, specifically SMEs. Ndubisi and Jantan (2003) applied TAM to investigate the impact on information systems usage by Malaysian small and medium firms. TAM was also tested by Sugiharto, Hermana, and Suhendra (2010) on small businesses in Indonesia. The researchers identified the influence of perceived usefulness, perceived ease-of-use, internet self-efficacy and internet anxiety on internet technology adoption. Similarly, Awiagah et al. (2015) emphasized TAM's contribution to e-commerce adoption in Ghanaian SMEs.

Furthermore, Davis et al. (1992) found perceived enjoyment as intrinsic motivation to fully affect the usage intention of perceived output quality. They also found the importance of computers in the workplace (Jamali et al., 2015). Additionally, Caniels et al. (2015) demonstrated perceived enjoyment or intrinsic motivation as important variables for technologically related studies. Meanwhile, inclusive perceived enjoyment in this study was measurable.

The relevance of this study is that the analysis that was carried out by past studies suggested that the TAM was most widely used for the assessment of technology, and thus has been proposed to include e-business adoption. Hence, e-business adoption's current relevance focus from the SMEs aspects is not as a technologically affected entity, rather as an important

belief that the person toward a system may be influenced by other factors. By identifying the variables that are important or even deciding factors (Venkatesh & Davis, 2000) for the effective use of e-business adoption, this can become a valuable resource for SMEs in relation to e-business adoption. In the present study, the use of TAM helped evaluate the acceptance of e-business platforms at the pre-establishment stage to understand the use intention that the SMEs manager or owner presents.

The technology acceptance factor in this study included perceived usefulness, perceived ease-of-use, and perceived enjoyment elements. Sarawak physical developments have led to significant lifestyle differences (Yusuf et al., 2018), especially among the younger SMEs as technologies are shaping their daily lives. This may influence younger SMEs to adopt e-business in their business activities, particularly perceived usefulness, perceived ease-of-use, and perceived enjoyment toward the attitude in e-business adoption. Hence, it is essential to have a better understanding of how technology acceptance factors influence managers' attitudes toward e-business adoption among SMEs.

2.3. Perceived Usefulness and Attitude toward E-Business Adoption

Davis (1989) defined perceived usefulness as the extent to which a person believed utilization of a particular technology may enhance her or his job performance. It provided insight into how the actual use and intention to use were influenced (Kanchanatane et al., 2014). Perceived usefulness was the most important factor that influenced the acceptance of technology for small businesses (Renko & Druzijanic, 2014). This was further supported by Davis (1989), in which the perceived usefulness in TAM explained how the person believed the technology would improve their job performance (Hasan & Mohd Nadzar, 2010).

In detail, the expected percentage of performance improvement from using the technology was assigned to six indicators, such as the speed of task performance, improvement in work performance, productivity, work efficiency, business process at work, and usefulness of technologies in the work environment (Otieno, 2015). Another study by Hauser and Simmie (1981) showed a similar perspective on the effectiveness of technologies that determined the adoption process. It was similar to the concept of perceived usefulness (Khayati & Zouaou, 2013). Finally, perceived usefulness was defined by the original TAM (Davis, 1989) as the behavior influenced according to the model.

Eventually, technology acceptance was influenced by the perception of users or potential users. In small businesses, perceived usefulness identified the influence of actual usage and intention to continue using technology (Renko & Druzijanic, 2014). Meanwhile, perceived usefulness was defined as the degree to which

an individual believed that using a particular system would enhance job performance. In this study, the e-business platform was perceived as useful if it enhanced users' business activities such as customer service, buying and selling process, and others. Additionally, e-business users judged perceived usefulness as the users cognitively compared the overall business performance with and without the e-business platform. Therefore, perceived usefulness was conceived as the dimension that influenced owners and manager attitudes toward technological adoption. This led the researchers to develop the following hypothesis:

H1: Perceived usefulness had a positive influence on attitude toward adoption, which directly predicted e-business adoption in SMEs.

2.4. Perceived Ease-of-Use and Attitude toward E-Business Adoption

Perceived ease-of-use was defined as the extent to which a person believed the technology was effortless (Zhou & Feng, 2017). Users' psychological demand for an e-business platform influenced their intention to adopt and use the platform. Therefore, the platform was considered complex and risky to adopt (Chemjor & Maru, 2017) due to its difficulty in use. Perceived ease-of-use was an independent construct of perceived usefulness that affected usefulness because improvement in the attribute positively affected the result and ultimately defined the perceived usefulness (Sondakh, 2017). Moreover, perceived ease-of-use was widely studied in terms of technology adoption. It has become an important contributing factor to increase users' satisfaction or adoption (Abd Hamid, Zaidi, Bakar, & Abdullah, 2016). Besides, it was used to measure the feasibility of technology use. For instance, the research conducted by Ndekwa (2014) showed a strong influence of perceived ease-to-use technology toward technology adoption among SMEs. In line with this, Mulero (2012) confirmed that perceived ease-of-use was a proven key determinant of users' intention to adopt.

In this study, perceived ease-of-use referred to an individual's understanding regarding the use of technology that would not require more psychological tension, time, and effort in using the technology (Zhou & Feng, 2017). In particular, perceived ease of use was defined as the degree to which an individual believed using the e-business platform would not require more effort. That included easy to operate business-related tasks and interacting with e-business platforms for the owners and managers in SME. Hence, perceived ease-of-use was conceived as the dimension that influenced owners and managers attitudes toward technological adoption and H2 was proposed.

H2: Perceived ease-of-use had a positive influence on attitude toward adoption, which directly predicted e-business adoption in SMEs.

2.5. Perceived Enjoyment and Attitude toward E-

Business Adoption

Perceived enjoyment was defined as the extent to which the activity of using the computer was perceived to be enjoyable in its own right, apart from any anticipated performance consequences (Caniels et al., 2015). Davis et al. (1992) found that perceived enjoyment had a significant effect on the use of the computer in the workplace. Also, there was a significant influence of perceived enjoyment toward the use of social media (Abdul Razak & Md Latip, 2016). Furthermore, perceived enjoyment obtained more attention from researchers studying users' intentions toward technology (Ciarniene & Stankeviciute, 2015).

The information technology manufacturer believed that providing enjoyable user interfaces could develop enjoyment and improve the use of the technology platform (Venkatesh, 2000). Consequently, perceived enjoyment was an intrinsic source of motivation that referred to the performance of the e-business platform for no obvious reason than the process of the performance itself. In other words, perceived enjoyment intrinsically motivated the users to use and stay on using the e-business platform. In this study, perceived enjoyment was used to determine attitudes toward adoption that directly predicted e-business adoption in SMEs, and H3 was postulated;

H3: Perceived enjoyment had a positive influence on attitude toward adoption, which directly predicted e-business adoption in SMEs.

2.6. Attitude toward E-Business Adoption in SMEs

Users' perceptions on new or existing software and other technical solutions in the TAM are investigated (Okadapau, 2016). The model explained the perception of users or potential users in accessing the solution and its general applicability. TAM concluded that the users' intention to adopt a technology depended on their attitude toward technology use (Carlet, 2015). In SMEs, the attitude of the manager or the manager himself plays an essential role in adopting the e-business platform for their business activities. On these grounds, attitude was defined as a learned predisposition by an individual to respond toward an object in either positive or negative ways (Liu, 2014). Hence, the positive or negative attitude influenced the decision to adopt the e-business platform among SMEs in Sarawak.

In this study, attitudes toward e-business were based on perceived usefulness, perceived ease-of-use, and perceived enjoyment in the e-business context. TAM further stated that users must be satisfied with the deployed technology. Some external aspects beyond the users' control could affect the acceptance level (Al Rahbi, 2017). Besides, a study from Okadapau (2016) emphasised the role of owners' or managers' attitudes toward e-business. With this in mind, the behavior of e-business adoption is varied and dependent on the SMEs' attitude.

The multiethnicity of Sarawak made up different attitudes of Sarawakian SMEs' managers or owners in

conducting business activities. Interestingly, owners or managers of SMEs were among the main factors to ensure that e-business was successfully adopted. Consequently, it is necessary to understand the factors influencing Sarawakian SMEs managers or owners' attitudes toward adopting the e-business platform. Based on the discussion above, the following hypothesis was formulated:

H4: Attitude toward adoption has a direct and positive effect on the intention to adopt e-business in SMEs.

3. Research Methodology

This study aims to explain and predict the expected relationship between technological acceptance factors and the dependent variable (e-business adoption among SMEs) through empirical testing of TAM theory. In addition, this study developed a self-administrated questionnaire to collect data for the analysis of the proposed hypotheses and to test and validate the research framework for e-business adoption among SMEs in Sarawak, Malaysia. In Malaysia, SMEs are defined based on the number of full-time employees and annual sales turnover. Micro Enterprises have less than 5 full-time employees and annual sales turnover of less than RM300,000. Small enterprises have 5 to 50 full-time employees and annual sales turnovers of between RM300,000 and RM15 million. Medium enterprises have 51 to 150 full-time employees and annual sales turnovers of between RM15 million and RM50 million. The sample size in the study was 228, which is sufficient and remains in accordance with Roscoe's (1975) rule of thumb as the sample size is concerning in 30 to 500 samples (Sekaran & Bougie, 2016). Besides, the researchers used a purposive sampling method to target owners of SMEs or managers involved in the decision-making process. The choice of SMEs was based on the fact that most companies have used a certain form of e-business platform, which helped the researchers gain a better understanding of the SMEs' behavior intention toward e-business adoption in the Sarawak context. It is worth noting that the research site is in Sarawak, Malaysia; hence, the definition and classification of Malaysian SMEs is referred to in this study.

Figure 1 shows the main steps involved in this study. The research questionnaire adapted structured close-ended questions and contains two sections. To develop multi-item constructs, the researcher undertakes a prudent review of the literature. The items related to perceived usefulness, perceived ease-of-use, perceived enjoyment, attitude toward adoption and adoption of e-business were adapted from past studies (see Appendix 1). The five-point Likert scale (1-Strongly Disagree, 2-Disagree, 3-Slightly Disagree, 4-Neutral, 5-Slightly Agree, 6-Agree, and 7-Strongly Agree) was used to describe the respondents' views of the extent of their

agreement and disagreement on each statement for perceived usefulness, perceived ease-of-use, perceived enjoyment, attitude toward adoption and adoption of e-business. The questionnaire was pre-tested within a small group of individuals before being distributed to the targeted sample. The responses from this sample group were analyzed and observed to see if the respondents comprehended the question and whether they were willing to answer some of the questions (Grimm, 2010). The purpose was to identify problems such as wording issues or difficulty levels to answer the question. Appropriate modifications in the questions were made for the final version of the questionnaire. Those participants associated with the pre-test were no longer qualified for inclusion in the last study (Kumar, 2011). Moreover, the pre-test was helpful in determining the strengths and weaknesses of the survey design.

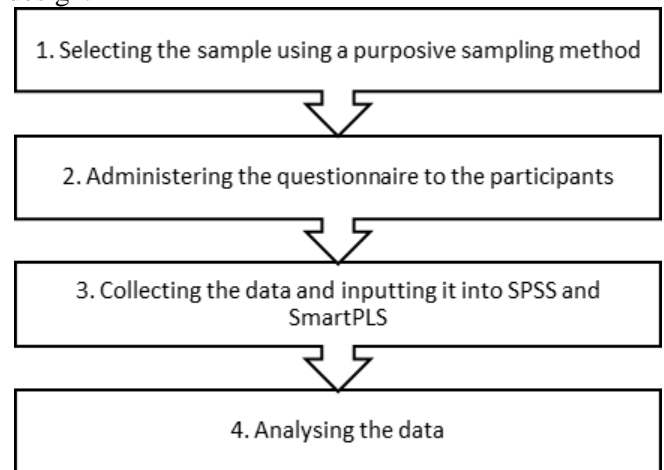


Figure 1. Schematic representation of the study

4. Findings

The data were analyzed using SPSS statistical software 26.0 and SmartPLS 3.0. This study performed a multivariate outlier analysis to screen the data before statistical analysis. The Mahalanobis distance was calculated using linear regression methods in SPSS. A total of 500 questionnaire sets were distributed to the owners or managers of SMEs in Sarawak. Out of the 238 testable samples retrieved, ten samples were removed as an outlier. Consequently, 228 were retained for hypothesis testing which yielded a response rate of 45.60 percent. Table 1 displays the characteristics of the 228 respondents in the survey. The respondents comprised females ($n = 125$) and males ($n = 103$). Their age classification is as follows: below 25 years old ($n = 58$), 25 to 29 years old ($n = 62$), 30 to 39 years old ($n = 67$), 40 to 49 years old ($n = 33$), and 50 years old and above ($n = 8$). An equal number of respondents had secondary ($n = 71$) and bachelor's degree ($n = 71$) qualifications. A negligible number of respondents had no formal qualification ($n = 3$) or postgraduate qualification ($n = 3$), which is equivalent to a one percent response rate. Thirty-one percent of the respondents reportedly had college qualification ($n =$

70) and four per the cent of them had the primary school qualifications (n = 10). Thus, the survey findings seemed influenced by younger educated company owners or managers.

Besides, the respondents were also required to indicate the ownership structure of their business. Most companies were registered as private limited (n = 142), followed by the partnership (n = 52) and sole proprietor (n = 34). More than half of the companies were from the service and other industry (n = 196), while fourteen per cent of the companies come from the manufacturing industry (n = 32). Moreover, sixty-six per cent of the companies had operated for more than five years (n = 150), followed by one to three years (n = 37), between three to five years (n = 36), and less than a year (n = 5). Most of these companies employed five to thirty employees (n = 91) for their business operations. Twenty-six per cent of the companies employed less than five employees (n = 59), another twenty-four per cent employed more than seventy-five employees (n = 55), and only ten per cent of the companies employed between thirty and seventy-five employees (n = 23), for their business operations. On the other hand, 88 companies had an annual turnover between RM 300,000 and RM 3,000,000, while only thirty-five companies had an annual turnover between RM 3,000,000 and RM 15,000,000. Twenty-six per cent of the companies had less than RM 300,000 (n = 60) annual turnover and nearly twenty per cent of

companies had more than RM15,000,000 (n = 45) annual turnover. As indicated in Table 1, the results illustrate that the majority of the companies operated in the local market (n = 106), followed by the international market (n = 78), and regional market (n = 44). It was observed that the percentage of enterprises catered to expand activities in regional and international markets. This may imply that SMEs in Sarawak are yet to heavily access regional and international markets. This is true despite the opportunities to go beyond domestic trade and into international markets because of the recent government intervention to promote SMEs. In sum, the results indicated the participation from different ownership structures, supporting the generalisability of the results to the overall SMEs.

Partial least squares structural equation modeling (SEM-PLS) approach based on SmartPLS 3.0 was used to analyse the data. The first step is to assess the measurement model, which looks at the constructs' reliability and validity. The second step of the structural model looks at the direct relationship between exogenous and endogenous variables (Hair, Hult, Ringle, & Sarstedt, 2017; Ramayah, Cheah, Chuah, Ting, & Memon, 2018). The constructs' reliability and validity are examined in all hypothesized relationships. The structural model is then evaluated using bootstrapping procedure with 500 bootstrap re-sampling as the second step.

Table 1. Demographics and company general information of respondents

Respondents (N = 228)			
Demographic variable and general variable of company	Category	Frequency	Percentage (%)
Gender	Male	103	45.20
	Female	125	54.80
Age Category	Below 25 years old	58	25.40
	25 to 29 years old	62	27.20
	30 to 39 years old	67	29.40
	40 to 49 years old	33	14.50
	50 and above	8	3.50
Highest Qualification	No Formal Qualification	3	1.30
	The Primary Qualification (UPSR)	10	4.40
	The Secondary Qualification (SPM/STPM)	71	31.10
	College Qualification (Diploma)	70	30.70
	Bachelor's Degree	71	31.10
Ownership Structure of Company	Postgraduate (Master/PhD)	3	1.30
	Sole Proprietor	28	12.30
	Partnership	52	22.80
The Principles of Company	Private Limited (Sdn. Bhd.)	142	62.30
	Manufacturing	32	14.00
The Age of Company	Service and Other Services	196	86.00
	Less than a year	5	2.20
The Total Number of Employees	1 to 3 years	37	16.20
	3 to 5 years	36	15.80
	More than 5 years	150	65.80
	Less than five	59	25.90
The Annual Sales Figure of Company	5 to 30 employees	91	39.90
	30 to 75 employees	23	10.10
	75 and above	55	24.10
	Less than RM300,000	60	26.30
The Best Describes of Enterprise Market Area	RM300,000 to RM3,000,000	88	38.60
	RM3,000,000 to RM15,000,000	35	15.40
	RM15,000,000 and above	45	19.70
The Best Describes of Enterprise Market Area	Local Market	106	46.50
	Regional Market	44	19.30

4.1. Assessment of the Measurement Model

Table 2 exhibits the reflective measurement assessment regarding their reliability and convergent validity. Regarding outer loading, all items met the recommended outer loading criterion (i.e., between 0.717 and 0.870) (Hair, Hult, Ringle, & Sarstedt, 2017). Two items with loadings below the acceptable value were removed, specifically referring to items named Adop_1 and Adop_2. Table 2 presents the remaining factor loadings that exceeded the ideal level of 0.708 and were considered acceptable interpretation for the factors (Hair, Hult, Ringle, & Sarstedt, 2017). Composite reliability (CR) is used to measure the internal consistency of the data, and average variance extracted (AVE) is used to measure the convergent validity of the data. Table 2 demonstrates all CR values above the critical value of 0.700; thus, all measurements were internally consistent (Hair, Hult, Ringle, & Sarstedt, 2017). The results listed in Table 2 show that the AVE of each model construct surpassed the

acceptable level of 0.500 (Hair, Hult, Ringle, & Sarstedt, 2017), establishing their convergent validity. In addition, discriminant validity was obtained using cross loading, Fornell and Larcker's Criterion, and Heterotrait-Monotrait ratio of correlations (HTMT). Table 3 illustrates the loading and cross-loading matrices, and all measurement items theoretically load above the respective constructs than the other constructs. Additionally, the square root of AVE was tested on the inter-correlations of the constructs with the other constructs to ensure discriminant validity (Fornell & Larcker, 1981). As shown in Table 4, the correlations for each of the constructs were less than the average variance extracted (in bold) by the indicators. All HTMT values were lower than the conservative threshold value of 0.900 (Gold, Malhotra, & Segars, 2001) (see Table 5). Thus, it can be concluded that discriminant validity was established between all constructs.

Table 2. Results of measurement model. Composite reliability (CR) = (square of the summation of the factor loadings)/{(square of the summation of the factor loadings) + (square of the summation of the error variances)}; average variance extracted (AVE) = (summation of the square of the factor loadings)/{(summation of the square of the factor loadings) + (summation of the error variances)}

Constructs	Measurement items	Cronbach's Alpha	Factor loading	Composite reliability	Average variance extracted (AVE)
Perceived Usefulness	Pufn_1	0.892	0.766	0.915	0.607
	Pufn_2		0.763		
	Pufn_3		0.805		
	Pufn_4		0.792		
	Pufn_5		0.838		
	Pufn_6		0.767		
	Pufn_7		0.717		
Perceived Ease-of-Use	Peof_1	0.872	0.723	0.904	0.611
	Peof_2		0.770		
	Peof_3		0.829		
	Peof_4		0.823		
	Peof_5		0.801		
	Peof_6		0.737		
Perceived Enjoyment	Penj_1	0.863	0.804	0.901	0.647
	Penj_2		0.838		
	Penj_3		0.811		
	Penj_4		0.816		
	Penj_5		0.750		
Attitude toward Adoption	Att_1	0.882	0.794	0.914	0.680
	Att_2		0.870		
	Att_3		0.814		
	Att_4		0.822		
	Att_5		0.821		
e-Business Adoption	Adop_3	0.837	0.721	0.891	0.673
	Adop_4		0.852		
	Adop_5		0.849		
	Adop_6		0.851		

Table 3. Loading and cross loading (Bold values are loadings for items that are above the recommended value 0.708)

	Perceived Usefulness	Perceived Ease of Use	Perceived Enjoyment	Attitude toward Adoption	eBusiness Adoption
Pufn_1	0.766	0.513	0.488	0.439	0.416
Pufn_2	0.763	0.501	0.483	0.418	0.390
Pufn_3	0.805	0.597	0.557	0.430	0.322
Pufn_4	0.792	0.580	0.484	0.387	0.416
Pufn_5	0.838	0.634	0.562	0.479	0.419

Continuation of Table 3

Pufn_6	0.767	0.538	0.522	0.469	0.423
Pufn_7	0.717	0.610	0.537	0.428	0.318
Peof_1	0.621	0.723	0.510	0.389	0.360
Peof_2	0.549	0.770	0.527	0.419	0.282
Peof_3	0.601	0.829	0.590	0.531	0.390
Peof_4	0.610	0.823	0.664	0.539	0.389
Peof_5	0.541	0.801	0.639	0.510	0.380
Peof_6	0.511	0.737	0.606	0.477	0.334
Penj_1	0.563	0.667	0.804	0.516	0.309
Penj_2	0.624	0.717	0.838	0.549	0.389
Penj_3	0.514	0.583	0.811	0.484	0.366
Penj_4	0.497	0.547	0.816	0.508	0.319
Penj_5	0.478	0.523	0.750	0.489	0.332
Att_1	0.483	0.480	0.453	0.794	0.545
Att_2	0.410	0.479	0.509	0.870	0.564
Att_3	0.446	0.494	0.524	0.814	0.493
Att_4	0.495	0.547	0.535	0.822	0.530
Att_5	0.480	0.537	0.585	0.821	0.594
Adop_3	0.318	0.276	0.286	0.417	0.721
Adop_4	0.502	0.457	0.412	0.567	0.852
Adop_5	0.371	0.366	0.328	0.557	0.849
Adop_6	0.424	0.384	0.365	0.609	0.851

Table 4. The Fornell-Larcker criterion for discriminant validity of constructs (Diagonals represent the square root of the average variance extracted, while the other entries represent the correlations)

	Attitude toward Adoption	Perceived Ease of Use	Perceived Enjoyment	Perceived Usefulness	eBusiness Adoption
Attitude toward Adoption	0.825				
Perceived Ease of Use	0.617	0.782			
Perceived Enjoyment	0.634	0.759	0.804		
Perceived Usefulness	0.562	0.729	0.668	0.779	
eBusiness Adoption	0.663	0.457	0.427	0.497	0.820

Table 5. HTMT criterion for discriminant validity on construct; HTMT < 0.90 (Gold, Malhotra, & Segars, 2001)

	Attitude toward Adoption	Perceived Ease of Use	Perceived Enjoyment	Perceived Usefulness	eBusiness Adoption
Attitude toward Adoption					
Perceived Ease of Use	0.695				
Perceived Enjoyment	0.724	0.866			
Perceived Usefulness	0.631	0.830	0.758		
eBusiness Adoption	0.761	0.527	0.499	0.569	

4.2. The Assessment of a Structural Model

The assessment of the structural model started by evaluating the collinearity between the variables. Table 4 exhibits that the variance inflator factor (VIF) values of all constructs ranged from 1.000 to 2.984 and were below the threshold of 3.33 (Becker, Ringle, Sarstedt, & Volckner, 2015). Hence, collinearity between the predictors was not an issue in this dataset. As shown in Figure 1 and Table 6, perceived usefulness ($\beta = 0.154$; $t = 1.595$) not positively related to attitude toward e-business adoption in SMEs. It can be concluded that H1 is not support. Furthermore, perceived ease-of-use ($\beta = 0.239$; $t = 2.807$) and perceived enjoyment ($\beta = 0.350$; $t = 4.370$) were positively related to the attitude toward e-business adoption in SMEs. Hence, it showed that H2 and H3 were supported. Empirical findings showed that

attitude toward adoption was positively related to e-business adoption ($\beta = 0.663$; $t = 14.855$). Therefore H4 was supported. This study calculated R^2 to assess the model in-sample fit. The R^2 value of e-business adoption was 0.439. Finally, the predictive relevance of the model was evaluated using the blindfolding procedure (Shmueli, Sarstedt, Hair, Cheah, Ting, Vaithilingam, & Ringle, 2019). The Q^2 value for attitude toward adoption was 0.299 as predicted by perceived usefulness, perceived ease-of-use, and perceived enjoyment. Besides, e-business adoption in SMEs was scored 0.290, as predicted by the respondents' attitude toward e-business adoption. Both categories of the Q^2 values were greater than 0, which indicated that this study had obtained a highly predictive model.

Table 6. Path coefficient and hypothesis testing ($t > 1.645^*$; $p < 0.05$, or $t > 2.33^{**}$; $p < 0.01$)

Hypothesis	Relationship	Coefficient	T-Value	Decision
H1	Perceived Usefulness -> Attitude toward Adoption	0.154	1.595*	Not Support

Continuation of Table 6

Hypothesis	Relationship	Path Coefficient	t-value	Support
H2	Perceived Ease-of-Use -> Attitude toward Adoption	0.239	2.807*	Support
H3	Perceived Enjoyment -> Attitude toward Adoption	0.350	4.370*	Support
H4	Attitude toward Adoption -> e-Business Adoption	0.663	14.855*	Support

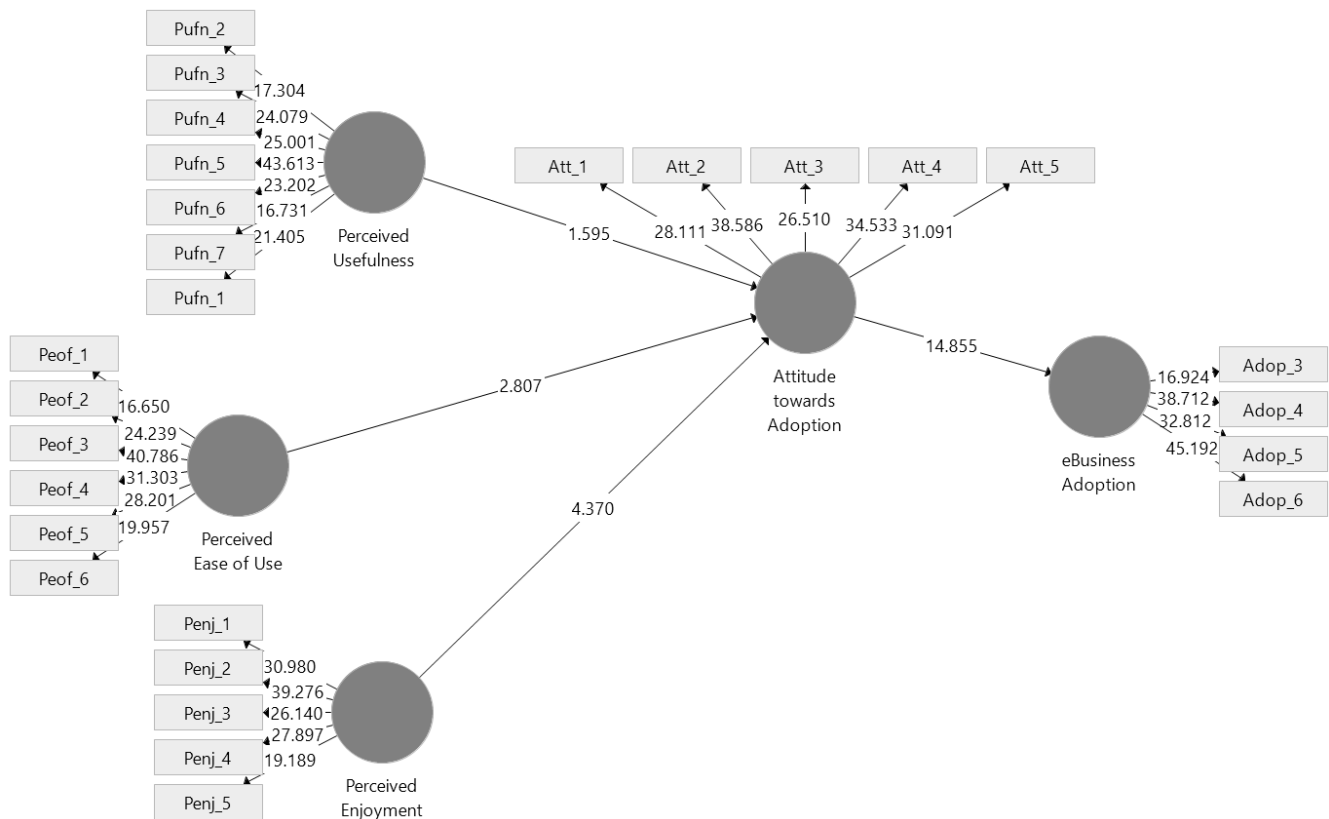


Figure 2. Results of the path analysis

5. Discussion

The results of the statistical analysis showed that Hypothesis 1 was not supported as perceived usefulness and attitude toward adoption were found to have no significant influence on e-business adoption among the SMEs in Sarawak. This finding was contrary to the study of Hussein, Sid Ahmed, and Alraja (2017), Kanchanatanee et al. (2014), Renko and Druzijanic (2014), and Khayati & Zouaou (2013), who found that perceived usefulness influenced the acceptance of technology for users in the adoption process. The insignificant relationship between the perception of SMEs managers or owners and the attitude toward e-business adoption means that the perception of usefulness was inversely proportionate to the attitude toward e-business adoption. This, therefore, implies that Sarawakian SMEs' managers or owners are becoming increasingly aware of the usage of e-business platforms, which would strengthen their attitude toward e-business platform adoption.

Moreover, perceived ease-of-use was found to be significant in predicting the attitude toward adoption, which directly predicted e-business adoption among the SMEs in Sarawak. Hence Hypothesis 2 was supported. This is consistent with the results of the research conducted by Chemjor & Maru (2017), Abd Hamid et al. (2016), Ndekwa (2014), and Mulero (2012)

concluded that perceived ease-of-use affects users' intention to adopt. There is a significant influence between perceived ease-of-use and the attitude toward e-business adoption, which shows that Sarawakian SMEs believe that the ease-of-use of e-business affects the attitude toward adoption in promoting business activities. Consequently, it was confirmed that the ease-of-use of the e-business platform formed the attitude of the SMEs' managers or owners to adopt the e-business platform for their business activities in Sarawak.

The resulting analysis for Hypothesis 3 indicated that perceived enjoyment and attitude toward adoption significantly influenced e-business adoption among SMEs in Sarawak. This result supports previous research conducted by Abdul Razak and Md Latip (2016) and Ciarniene and Stankeviciute (2015), who found perceived enjoyment obtained more attention and positively influenced users' intentions toward technology. This means that the SMEs of Sarawak consider the sense of enjoyment in adopting an e-business platform to affect their attitude in doing business activities. Accordingly, perceived enjoyment is an important acceptance factor that influences the attitude of SMEs' managers or owners to decide about adopting the e-business platform in Sarawak.

The final hypothesis stated that the attitude toward adoption had a significant positive impact on e-business

adoption among the SMEs. Hence Hypothesis 4 was supported. The finding confirmed that the users' intention to adopt a technology depended on their attitude toward technology use, as explained in TAM (Okadapau, 2016 & Carlet, 2015; Mramba). This substantiates previous findings in the literature such as those by Hoseini and Jafarpour (2016) and Ahmad, Abu Bakar, Faziharudean, and Mohamad Zaki (2014), who found statistically significant relationships between attitude and the SMEs' intention to use technology. This was not a surprise since the attitude added explanatory power to an individual's intention to use a particular information system (Bugembe, 2010). The results explained that companies with a positive management attitude toward technology adoption had a greater tendency to initiate online business activities. Consequently, the owners' or managers' attitude was the deciding factor that positively influenced e-business adoption among the SMEs in Sarawak.

With assumption, the result indicates that the SMEs in Sarawak were paying attention to core business functions such as market channel or production, which were more important compared to the usefulness of e-business in this study. Besides, practical SMEs are purposeful, yet experienced users intend to obtain the most ease and enjoyment from the e-business platform to conduct business. Therefore, the study shows that increased awareness of e-business platforms in SMEs is the perfect way to increase the adoption of the technology. The Sarawak government plays an important role in the improvement that encourages the spreading of technology adoption in the area.

6. Conclusions, Implications, and Limitations

This study demonstrates that the Technology Acceptance Model (TAM) can be applied to theoretically explain the direct impacts of the proposed predictors on e-business adoption. This study has contributed to the current debate on the relationship between perceived usefulness, ease-of-use, enjoyment, and attitude toward e-business adoption. The analysis reveals that perceived ease-of-use and perceived enjoyment were significantly interrelated with the attitude toward adoption, which directly predicts e-business adoption in SMEs. Unfortunately, perceived usefulness is unable to emit a positive influence toward e-business adoption in Sarawakian SMEs. The results confirm that perceived usefulness has no influence on the owners' or managers' attitudes toward adoption. It provides empirical evidence of the factors influencing attitudes toward e-business adoption among SMEs in Sarawak, which has received little attention in the literature to date. Moreover, this study contributes to the literature on technology adoption by applying TAM in the context of SMEs in Sarawak. This contributes to the

knowledge of e-business adoption in Sarawak and acts as a guide to future studies to develop more comprehensive models of technology adoption behavior in Sarawak.

As mentioned earlier, the Sarawak state government is encouraging SMEs to exploit technology in their business modules. The result confirmed that the attitude toward adoption had a direct and positive effect on behavior intention among the SMEs in Sarawak to adopt e-business. To enable the SMEs to adopt the e-business platform, the Sarawak government should pay serious attention to the managers or owners of the SMEs. The reason is that the managers or owners of SMEs have significant influence on their business activities. Hence, the initiatives undertaken by the Sarawak government to encourage SMEs' technological development must include the participation of SMEs managers or owners. To encourage Sarawakian SMEs to adopt the e-business platform, the government must offer insights into the marketing and business benefits after the adoption of the e-business platform to the SMEs' managers or owners.

This research has certain limitations. The limitations of the application of the results obtained are that the study used a quantitative method based on self-administered questionnaires, which only reflects the respondents' attitudes and experiences with e-business platforms at a specific point in time. Thus, the results may not be applicable eventually as attitudes and experiences with e-business platforms can change over time. Furthermore, this study does not control the differences across manufacturing and services industries. In other words, the respondents were free to access the e-business platform before filling out the prepared questionnaire. This could be due to the researchers' existing knowledge about the most significant influences affecting e-business adoption among SMEs in Sarawak. However, it would be interesting to re-conduct the research in a single sector such as manufacturing, tourism, or wholesale, and retail. The objective is to obtain a much deeper understanding of the industry-specific variables that influence the intention to adopt e-business in the future. These limitations suggest that caution should be taken when generalizing the findings of this study to other contexts.

In sum, the outcomes of the study enhanced the main body of literature in the development of e-business adoption in Sarawak. This work additionally assists in a better understanding of the determinants of e-business adoption and intention amongst SMEs that led to technology in the state. Generally, it is of aid to the government to understand what influences SME owner's attitudes as well as how to encourage them to become involved on the Internet. The generalized findings will also help SMEs implement consistent technology tools to boost the economy.

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