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Relationships Among Owner-Manager Characteristics, E-commerce Adoption and Performance of Small and Medium Enterprises (SMEs) in Malaysia*

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Abstract

This study examined the relationships among owner-manager characteristics, e-commerce adoption, and performance of small and medium enterprises (SMEs) in Malaysia. Although the growth of e-commerce was encouraging in many countries, studies of e-commerce adoption among SMEs in developing countries such as Malaysia are insufficient. Furthermore, studies that investigated individual characteristics and e-commerce adoption are still low in number. This study specifically employed the technology-organization-environmental (TOE) framework to develop its research model. The sample was selected by using a non-probability judgmental sampling technique because the desired population frame was unavailable. A total of 111 owner-managers of SMEs were surveyed using online self-administered questionnaires. Subsequently, the data was analyzed through partial least square-structural equation modeling (PLS-SEM). The results revealed significant relationships between owner-manager characteristics and e-commerce adoption, as well as between e-commerce adoption and the performance of SMEs. The findings suggested that owner-manager characteristics played an important role in determining e-commerce adoption among SMEs. Moreover, e-commerce adoption was crucial in affecting the performance of SMEs. This paper provided new insights into factors affecting e-commerce adoption and firm performance. It could further benefit the government and SMEs in strategizing e-commerce adoption and development, especially in the era of Industrial Revolution 4.0 (IR 4.0) and the post-COVID-19 pandemic.

Keywords: Adoption, E-commerce, Owner-managers, Performance, Enterprises

JEL Classification Code: L25, L26, M10, M15

1. Introduction

The performance of e-commerce in Malaysia was rather encouraging in recent years. The Department of Statistics Malaysia (DOSM) (2021) revealed that e-commerce income

in 2020 recorded an increase of 32.7% to RM896.4 billion as compared to 2019. The e-commerce income in 2019 was RM675.4 billion, while the e-commerce expenditure was RM301.5 billion. Thus, it is undoubtedly that the e-commerce sector in Malaysia has great potential to grow due to various online services offered by businesses and the increase in Internet usage, computers, and web presence.

For years, the Malaysian government has implemented various initiatives to encourage small and medium enterprises (SMEs) to engage in e-commerce. For example, the Malaysia Digital Economy Corporation (MDEC), an agency under the Ministry of Communication and Multimedia Malaysia, has established an online platform known as Go-eCommerce to guide and assist SMEs and micro-entrepreneurs in using e-commerce for their businesses (MDEC, 2019). In addition, National E-commerce Strategic Roadmap 2.0 (NeSR 2.0) has been implemented to accelerate the adoption of e-commerce by businesses and support the growth of the e-commerce market in the country. Furthermore, the Malaysia Digital

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Economy Blueprint was also introduced in 2021 to spell-out efforts in realizing the aspiration of MyDIGITAL, an initiative that aims to transform Malaysia into a digitally-driven and high-income nation.

Apart from the encouragement from the Malaysian government, the recent COVID-19 pandemic has also forced many SMEs to change their business operations model from brick-and-mortar to online. It happened because of a change in consumers' needs and desires from offline transactions to online transactions as a preventive action for COVID-19 infection. It is believed that consumers will continue to utilize e-commerce in the post-COVID-19 pandemic era. The potential of continuous growth of e-commerce in Malaysia will provide many new opportunities to SME operators. However, studies of e-commerce adoption among SMEs in developing countries are insufficient (Nazir & Zhu, 2018). Therefore, further investigations on e-commerce are required in Malaysia to evaluate the achievements of governmental initiatives and to have a better understanding of the performance of SMEs adopting e-commerce.

The relationship between the use of digital technology and business performance has been investigated by many researchers. For instance, Ibrahim et al. (2019) found that e-commerce adoption in business increased business continuity, sales, and profitability. In addition, it also affects SMEs' business strategies (Aizstrauta et al., 2015) and financial performance (Sombultawee, 2020). On the contrary, Thompson et al. (2013) asserted that e-commerce adoption did not always improve performance. Furthermore, Ahmad et al. (2019) argued that the adoption of social media does not affect the performance of MSMEs in the UAE. The contradicting results obtained by previous researchers marked the urgency to further scrutinize the relationship between e-commerce adoption and business performance.

In the context of Malaysia, the adoption of e-commerce among SMEs has been investigated by many researchers, for example, Koe and Sakir (2020), Yusoff et al. (2021), Perumal et al. (2021), Shanmugam et al. (2022), just to name a few. The previous studies have undoubtedly provided many new insights regarding factors influencing e-commerce adoption; however, research into a specific factor, such as owner-manager's characteristics, is still low in number. Furthermore, there is a lack of investigation into what happened after firms adopted e-commerce. Questions such as would owner-managers characteristics affect the adoption of e-commerce and would the performance of SMEs increases after e-commerce adoption remained unanswered. As such, this study aimed to investigate the relationship among owner-manager characteristics, e-commerce adoption, and the performance of SMEs.

2. Literature Review

2.1. E-commerce

Online stores are expected to record a 385% increase in sales this decade; however, knowing the fundamentals of e-commerce is crucial (DeMatas, 2021). Among the general e-commerce, classifications are such as business-to-business e-commerce (B2B), business-to-consumer e-commerce (B2C), consumer-to-consumer e-commerce (C2C), consumer-to-business e-commerce (C2B) and government or public administration e-commerce (DeMatas, 2021). As DeMatas (2021) described, B2B refers to e-commerce which provides products from one business to another business; B2C is the online business that sells to individuals; C2C allows consumers to trade, sell and buy for commission; C2B happens when consumer sells products to business; while government e-commerce involves government performing transactions with businesses or individuals.

It is widely known that e-commerce could provide various benefits to businesses. Indeed, the business transacting process is quick and simple on the web, a great variety of products can be stored on it, it offers unlimited operations hours, it is easy to share information, and it allows access to a worldwide market, to name a few (Patel, 2017). Furthermore, Leu and Masri (2021) pointed out that digital business was crucial in achieving sustainable success and operational excellence. Knowing the tremendous benefits brought by e-commerce, the Malaysian government has implemented a series of strategies or initiatives to boost e-commerce development in the country. For example, the establishment of a Go-eCommerce platform, the introduction of National E-commerce Strategic Roadmap 2.0 (NeSR 2.0), and the Malaysia Digital Economy Blueprint. As such, it is time to evaluate the achievements of those initiatives, especially their adoption among SMEs in Malaysia. Moreover, e-commerce has also become a common way of doing business due to the COVID-19 pandemic. Many traditional businesses have shifted to e-business, and consumers have changed their buying platforms to online. As such, examining the performance of the business after e-commerce adoption is deemed viable.

2.2. Theoretical Foundation

Previous studies have employed various theories or models in investigating e-commerce adoption. Among them were as Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of Innovation Model (DOI), Technology-Organization-Environmental Framework (TOE), etc.

Most studies have employed models such as TOE and DOI; whereby both models focused on the organization,

and the individuals involved, to explain the adoption of technology by people and organizations (Ahmad et al., 2019). However, the TOE framework was formulated to determine the influence of contextual factors in predicting the possibilities of innovation adoption (Rahayu & Day, 2015; Awa et al., 2015). There are three factors, namely technology, organization, and external task environment that influence the adoption of innovations or technologies in firms.

Previous scholars such as Aswar et al. (2021), Deng et al. (2019), and Lekmat (2018) have employed TOE in their studies. Meanwhile, Nazir and Zhu (2018) extended TOE to include individual factors. Ahmad et al. (2015) pointed out that studies of the influence of organizational context on e-commerce adoption have yielded different results. Therefore, it is truly a construct which worth further investigation. Following Nazir and Zhu (2018), this paper focused on individual factors of organizational context in TOE.

2.3. Individual Factor and E-commerce Adoption

According to Ahmad et al. (2015), elements of organizational context include e-commerce knowledge and management attitude. They further confirmed that owner-managers e-commerce knowledge and management attitude towards e-commerce positively and significantly related to e-commerce adoption in Malaysia. Meanwhile, Lekmat (2018) explained organizational context as organizational competence and top management commitment and support. They further found that these two elements promoted e-commerce adoption among SMEs. Similarly, Deng et al. (2020) identified that top management support was critical for the adoption of e-markets among SMEs in Australia.

From the organization-level perspective, the knowledge management process was significantly related to the adoption of e-commerce (Nasution et al., 2021). Specifically, Nasution et al. (2021) found a positive and significant relationship between knowledge management and e-commerce adoption; it was possibly due to the respondents who graduated with bachelor's and master's degrees. Therefore, there is a need to scrutinize the factors of e-commerce adoption from the individual level, such as individual awareness and knowledge.

The individual factor of SMEs is normally related to the owner-managers' characteristics. Nazir and Zhu (2018) included individual factor in their model and found that it has greater influence than technological and environmental factors in affecting SMEs' adoption of e-commerce. Furthermore, they pointed out that owner-manager characteristics influenced e-commerce adoption. Some interesting results were obtained by Govinnage and Sachitra (2019); in which they found that computer literacy significantly influenced e-commerce adoption, but perceived benefits were not an

important factor. Undoubtedly, existing works of literature have successfully explored the relationship between owner-manager characteristics of SMEs and innovation creation and adoption; however, such a relationship required further empirical examination because it could help to discover the innovation process in SMEs (Daneji et al., 2019).

In addition, individual expectations, such as performance expectancy and effort expectancy, significantly influenced e-commerce adoption (Sombultawee, 2020). Singh and Kalia (2020) mentioned that owners-managers of micro, small and medium enterprises (MSMEs) perceived e-marketing as an important element in their business success. Furthermore, they believed that e-marketing activities such as displaying advertising, social media marketing, and mobile marketing increase their business effectiveness.

2.4. E-commerce Adoption and Performance of SMEs

E-commerce should not be treated as merely an online mechanism for selling products and services because it facilitates consumers in the purchasing process and further increases sales turnover (Octavia et al., 2020). True, their results confirmed that e-commerce adoption significantly affected the business performance of SMEs. They further recommended that SMEs should apply e-commerce in their business to improve their business performance. Furthermore, effective utilization of Internet technology is crucial. As an example, Cao and Yang (2016) suggested that Chinese tourism websites should use the Internet to its full potential to improve their performance; for instance, by adding more online features, adopting e-commerce fully, and enhancing customer relationship management (CRM) services.

The adoption of e-commerce could bring positive implications. Odoom et al. (2017) suggested that the performance of SMEs could be measured through financial and non-financial performance. They further pointed out that the adoption of e-commerce affected the performance of SMEs. Similarly, Fuller et al. (2022) surveyed 500 internet retailers and found that early adopters of e-commerce capabilities obtained higher online sales and a greater number of monthly visitors. In addition, various researchers have also unanimously found that e-commerce enhanced business performance (Sriayudha et al., 2020; Lekmat, 2018), improved business continuity, sales, and profitability (Ibrahim et al., 2019), enhanced business strategies (Aizstrauta et al., 2015) and, increased market share, competitiveness and profitability (Ibrahim et al., 2019; Soegoto & Utomo, 2019; Lim et al., 2018).

Although many previous studies supported that e-commerce adoption affected firm performance, some

interesting results were obtained by some other researchers. For instance, Priambodo et al. (2021) concluded that e-commerce capabilities did not significantly influence the e-commerce performance of firms in the creative industry. Meanwhile, Sombultawee (2020) found that e-commerce adoption recorded a relatively low effect on firm performance. In addition, Macchion et al. (2017) found that the adoption of e-commerce improved a firm's innovation performance, but it was not significantly associated with operational and business performance. Ahmad et al. (2019) further argued that the adoption of social media did not affect the performance of MSMEs in the UA. Due to the contradicting findings obtained by previous scholars, the relationship between e-commerce adoption and firm performance indeed requires further investigation.

2.5. Research Framework and Hypotheses Development

Based on the discussions in the previous sections, individual factors, specifically owner-manager characteristics influenced e-commerce adoption, and eventually, it affected the performance of SMEs. Therefore, the following research model was suggested (Figure 1), and the following hypotheses were suggested to guide the study:

H1: *Owner-manager's characteristics positively influence e-commerce adoption.*

H2: *E-commerce adoption positively influences the performance of SMEs.*

3. Research Methods

This study adopted a quantitative research method. Specifically, a questionnaire survey was employed for several reasons. First, the quantitative method was based on the philosophy of positivism and was used to study a specific population or sample. Second, the survey was deemed appropriate for collecting the desired data because all variables were measurable quantitatively. Third, a survey was suitable for reaching a great number of respondents. Fourth, a survey could be conducted in a non-contrived setting and requires very minimal interference from the researcher. The units of analysis were owner-managers of

SMEs because they were responsible for the day-to-day operations of firms. The time horizon was cross-sectional in which data was collected once.

The population consisted of SMEs from various types of businesses that have adopted e-commerce in Malaysia. Since the population frame was unavailable and the exact population size was unknown, the sample was selected through a non-probability sampling technique. In particular, judgmental sampling was used. Judgmental sampling involved selecting the subjects who were considered the best in providing the data (Sekaran & Bougie, 2016). The data were collected from 111 owner-managers of SMEs in Malaysia.

An online self-administered questionnaire was used as the instrument for data collection. A self-administered questionnaire was suitable because data could be collected within a short period (Sekaran & Bougie, 2016). Since the data collection was performed during the COVID-19 pandemic period, all questionnaires were distributed and collected via an online platform to prevent human contact. All items in the questionnaire were adapted and slightly modified from previous studies to ensure reliability and validity. There were five items for owner-manager characteristics (Abdilahi et al., 2017), ten items for e-commerce adoption (Awa et al., 2015), and four items for the performance of SMEs (Li et al., 2009). All items used a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree.

The data analysis technique was partial least square-structural equation modeling (PLS-SEM). SEM is the second generation of multivariate analysis technique which allows analysis of the relationship between complex variables, both recursive and non-recursive (Ghozali, 2012). Especially, the software Smart-PLS 3.0 was used to perform the analysis. Data were screened and cleaned before statistical analysis. Subsequently, descriptive and inferential analyses were performed.

4. Results and Discussion

4.1. Respondents' Background

In terms of the forms of business registration, 39 (35.14%) SMEs were sole proprietorship businesses, followed by a partnership ($f = 38$; 34.23%) and private limited company ($f = 34$; 30.63%). As for size and number of full-time

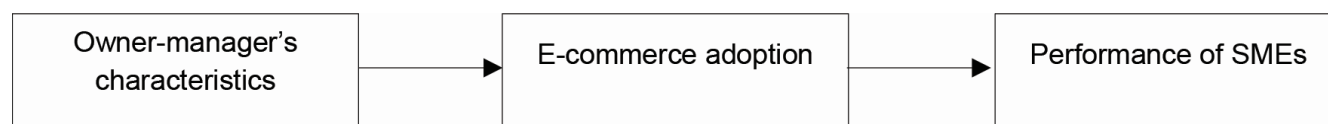


Figure 1: Research Model

employees hired, a vast majority of SMEs were small-size enterprises with five to 74 full-time employees ($f = 73$; 65.77%), while 38 SMEs (34.23%) were categorized as micro-enterprises that hired four or less full-time employees. In addition, the largest number of types of business was service ($f = 74$; 67.67%), followed by manufacturing ($f = 30$; 27.03%) and others such as plantation, agriculture, fishery, etc. ($f = 7$; 6.31%).

4.2. Measurement Model Assessment

Three main assessment criteria were used in assessing the measurement model, namely internal consistency reliability, convergent validity, and discriminant validity. Table 1 depicts factor loadings, Cronbach's alpha (α), composite reliability (CR), and average variance extracted (AVE), which were used to examine indicator reliability, internal consistency reliability, and convergent validity. Although Hair et al. (2014) mentioned that researchers should retain outer loadings greater than 0.708; Hulland (1999) suggested that loading values of at least 0.40 are acceptable if the AVE is greater than 0.50. Therefore, four items (EA 5 to EA 8) in e-commerce adoption with low loading values (<0.40) were deleted, while all items in the owner-managers characteristics and performance of SMEs were retained. In addition, all α values were deemed satisfactory because they were greater than 0.70. As for CR and AVE, they were regarded acceptable because all CR values were between 0.70 and 0.90 and all AVE values passed the threshold of 0.50

Table 1: Item Loadings

Construct	Items	Loading	α	CR	AVE
Owner-manager's characteristics (MC)	MC4	0.840	0.778	0.838	0.518
	MC3	0.813			
	MC5	0.766			
	MC2	0.645			
	MC1	0.471			
E-commerce adoption (EA)	EA1	0.877	0.791	0.849	0.501
	EA2	0.868			
	EA3	0.830			
	EA4	0.628			
	EA9	0.474			
	EA10	0.420			
Performance of SMEs (PS)	PS2	0.862	0.830	0.887	0.662
	PS3	0.842			
	PS4	0.778			
	PS1	0.770			

(Hair et al., 2014). Thus, the results indicated that internal consistency reliability, indicator reliability, and convergent validity existed in this study.

Meanwhile, three criteria, namely Fornell and Larcker's criterion (Table 2), cross-loading criterion (Table 3), and Heterotrait-Monotrait ratio of correlations (HTMT) (Table 4), were employed in determining discriminant validity. First, square roots of AVEs (diagonal) were greater than correlations (off-diagonal) of all constructs (Table 2). Next, all indicators on the assigned constructs recorded loadings that were higher than the loadings of all other constructs (Table 3). Lastly, all HTMT values were well below HTMT_{0.85} value of 0.85 (Table 4). Since all three

Table 2: Fornell and Larcker's Criterion

	MC	EA	PS
MC	0.720		
EA	0.666	0.708	
PS	0.153	0.292	0.814

Table 3: Crossed Loadings

	MC	EA	PS
MC1	0.471	0.148	0.094
MC2	0.645	0.310	0.112
MC3	0.813	0.429	0.094
MC4	0.840	0.528	0.038
MC5	0.766	0.692	0.195
EA1	0.684	0.877	0.137
EA2	0.656	0.868	0.249
EA3	0.526	0.830	0.239
EA4	0.384	0.628	-0.009
EA9	0.111	0.474	0.397
EA10	0.136	0.420	0.416
PS1	0.263	0.098	0.770
PS2	0.228	0.115	0.862
PS3	0.242	0.170	0.842
PS4	0.209	0.116	0.778

Table 4: HTMT Values

	MC	EA	PS
MC			
EA	0.676		
PS	0.184	0.434	

criteria were met, thus discriminant validity was achieved. The findings further indicated that the measurement model was reliable and valid, and could proceed to structural model assessment.

4.3. Structural Model Assessment

In assessing the structural model, it is crucial to ensure that lateral collinearity issue does not exist. Table 5 presents the inner variance inflation factor (VIF) values. Since VIF values were well below the threshold of 5.0, lateral multicollinearity was not an issue in this study (Hair et al., 2014).

Figure 2 illustrates the structural model of this study. There were two direct hypotheses developed. Specifically, bootstrapping was performed to compute *t*-statistics for the significance of all paths. The results of the hypotheses testing are summarized in Table 6. The results indicated that all relationships obtained *t*-values greater than 2.33, therefore they were significant at 0.010 level of

significance. Specifically, owner-manager characteristics ($\beta = 0.666$; $p < 0.01$) positively influenced e-commerce adoption and, it explained 44.3% ($R^2 = 0.443$) variance of e-commerce adoption. The $f^2 = 0.796$ indicated that the owner-manager’s characteristics had a large effect on producing R^2 for e-commerce adoption. Meanwhile, e-commerce adoption ($\beta = 0.292$; $p < 0.01$) influenced the performance of SMEs positively and it explained the 8.5% ($R^2 = 0.085$) variance of the performance of SMEs. However, the small f^2 value (0.093) showed that e-commerce adoption had a small effect in producing R^2 for the performance of SMEs. As Q^2 values for both e-commerce adoption ($Q^2 = 0.199$) and performance of SMEs ($Q^2 = 0.041$) were above zero; they showed that the model had sufficient predictive relevance.

4.4. Discussion

Based on the analyses, all two hypotheses (H1 and H2) were supported. Particularly, individual factors in organizations, such as owner-manager’s characteristics which include their knowledge, expertise, and support affected the adoption of new technology and innovation, such as e-commerce. The finding was similar to Nazir and Zhu (2018), Govinnage and Sachitra (2019), Daneji et al. (2019), Koe and Sakir (2020), and Nasution et al. (2021). As most of the respondents in this study were owner-managers of micro- and small-sized enterprises, they were the main persons who made most of the core decisions in business. Their characteristics directly affected the decision

Table 5: Lateral Collinearity Assessment

	MC	EA	PS
MC			
EA	1.000		
PS	1.000		

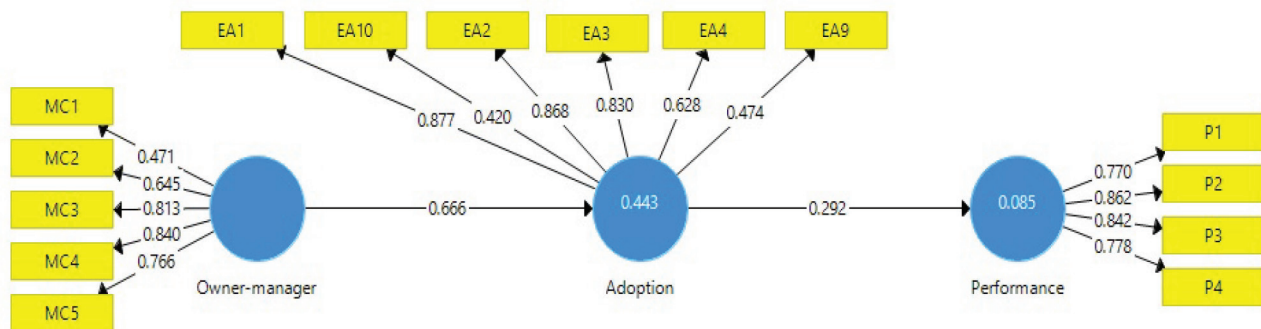


Figure 2: Structural Model

Table 6: Hypotheses Testing

Hypothesis	Path	Beta	SE	<i>t</i> -value	Decision	R^2	f^2	Q^2
H1	MC → EA	0.666	0.046	14.459**	Supported	0.443	0.796	0.199
H2	EA → SP	0.292	0.104	2.799**	Supported	0.085	0.093	0.041

** $p < 0.01$.

on e-commerce adoption. The decision-making process in SMEs is normally concentrated on owner-managers because SMEs possess scarce resources, have flatter organizational structures, and are less bureaucratic. Furthermore, SMEs need to adopt new technology and innovation to compete with their rivals due to their stiff competitive business landscape. Therefore, decisions pertaining to technology adoption need to be made quickly and sometimes without complete information. Thus, it is not surprising that owner-managers characteristics play a significant role in affecting e-commerce adoption.

In addition, the adoption of e-commerce was found to positively influence the performance of SMEs. The result supported previous studies such as Odoom et al. (2017), Aiztrauta et al. (2015), Lekmat (2018), Ibrahim et al. (2019), Sriyudha et al. (2020), Fuller et al. (2022), etc. The development of Web and Internet technology has brought various changes to today's business world. The changes are mainly positive and could enhance the operations of the business. For instance, doing business online, cashless and instance transactions, and real-time feedback are some of the new practices that could transform SMEs to be more effective and efficient. In addition, it is important to note that adopting e-commerce is just one of the new ways of doing business in the Industry Revolution (IR) 4.0 and post-COVID-19 era. Using e-commerce is not just a trend for business but a must for business survival. As current consumers are becoming more Internet savvy than before, moving towards e-commerce is a must-do for SMEs to continue serving existing consumers and attract new ones. However, it is important to note that many other factors determine the performance of SMEs, and SMEs should pay equal attention to those factors.

5. Conclusion

This study aimed to determine the influence of owner-manager characteristics on e-commerce adoption and the effect of such adoption on the performance of SMEs. It could be concluded that owner-managers characteristics positively influenced e-commerce adoption. Moreover, the performance of SMEs was influenced by e-commerce adoption positively. It is recommended that owner-managers of SMEs should be given sufficient information or knowledge about e-commerce so that they understand the importance of e-commerce adoption. Furthermore, SMEs should also be encouraged to adopt e-commerce in their business to increase their performance from various aspects. Government agencies play a crucial role in imparting e-commerce-related information and supporting e-commerce adoption. Specifically, efforts such as providing training to owner-manages and incentives to SMEs are required. In addition, trade associations can also help to promote e-commerce adoption.

This study was significant because it illustrated relationships among owner-manager characteristics, e-commerce adoption, and firm performance. Specifically, it provided information on factors that influence the adoption of e-commerce among SMEs to suit the changes in consumers' needs for online purchases. In addition, it also highlighted the importance of e-commerce adoption on the performance of SMEs. This study provided benefits to various business practitioners by pinpointing the important factors to be considered in strategizing e-commerce exercise, especially in the era of IR 4.0 which focuses on Web applications and the use of the Internet in business. This study is also useful to policymakers in designing strategies for e-commerce development and adoption in the country. Specifically, the government could identify important factors affecting e-commerce adoption and further establish supportive policies to enable a greater e-commerce adoption rate among SMEs in the country.

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