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The Impact of TOE Framework on E-Commerce Advantage Among Small Medium Enterprise (SME's) Digital Channel In Malaysia

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Abstract

Purpose: This study aims to understand the impact of e-commerce's advantage among SME's digital channel in Malaysia. To achieve the objective, this study used Technology, Organization, Environment (TOE) framework, Diffusion of Innovation (DOI) theory and Resource-Based View (RBV) theory. **Research design, data and methodology:** This study is quantitative method involve 195 SMEs online business in Malaysia. The integrated framework highlights the conceptual insight in multidimensional technology context (i.e. relative advantage, compatibility, and complexity); organizational context (i.e. top management support, innovation capability, branding capability, market-sensing capability, and human and organization capability); and environmental context (i.e. government support and supplier pressure). **Results:** The findings revealed that complexity, branding capability, human and organization capability, government support, and supplier pressure have significant positive relationship with e-commerce advantage. Meanwhile, relative advantage, compatibility, innovation capability, and market-sensing capability have significant negative relationship with e-commerce advantage. However, top management support has found no significant relationship with e-commerce advantage. **Conclusions:** The extended theoretical framework dimension improves existing knowledge on e-commerce advantage as well as the prospect of SMEs digital channel.

Keywords : E-Commerce Advantage, Digital Channel, Small-Medium Enterprise (SMEs), TOE Framework

JEL Classification Code : M31, M38, O32

1. Introduction

Technological advances and digitalization in business have a huge impact on retail development, whether for large or small companies. For instance, the transformation from conventional bricks-and-mortar to digital channels or omni-channel retailers (Berman & Thelen, 2018). According to Wagner, Schramm-Klein, and Steinmann (2020), a digital channel is a specific digital shopping design that a retailer uses to give buyers a web-based shopping approach. Thus,

significant changes in the digitalization evolution are also supported by the use of the internet in SMEs (Wirtz, Schilke, & Ullrich, 2010), which allows them to develop digital channels such as e-commerce (Cao, Ajjan, & Hong, 2018). Moreover, the features of digitalization in business, such as customer engagement, openness, and networking effectiveness, enable SMEs to provide the necessary business channels for current market needs as well as give them a profit (Kaplan & Haenlein, 2010).

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In the context of online business, digitalization in SMEs such as using e-commerce is viewed as principles that direct and influence the activities of SMEs to ensure the viability and performance of the firm. For instance, the digital channel has shifted marketing activities for SMEs such as customer relationship management (Chatterjee & Kar, 2020). Furthermore, the unique characteristics of using the internet in business, such as its high-speed capability, user-friendliness, low cost, and wider access, allowed business operations to expand from local into global networks, improving the advantage of e-commerce (Abeliansky & Hilberts, 2017; Liu & Nath, 2013). A previous study by Serrano and Tauheed (2018) reported that the use of the internet in doing business has been adopted around the world. Using the internet is not only applicable to reaching new customers and as a medium of distribution, but also to strengthening the relationship between a company and an existing customer (Fernandes & Moreira, 2019; Moisescu, 2018).

1.1. Small-Medium Enterprise in Malaysia

Malaysia is committed to expanding its economy to become a high-income and advanced economic country. The Malaysian government has been focusing on SME's development as one of the main vehicles for the economy to achieve high-income nation status. According to the World Bank Group in 2018, 77% of SMEs in Malaysia have digitalized their businesses. However, only 25% of businesses are achieving advanced digitalization. Hence, the data suggests that Malaysian SME businesses still have room for development and growth.

The Malaysian government has been focusing on SME development in order to enhance their validity and contribution to economic growth. The initiatives that have been implemented since 2007 have yielded positive results. More than 200 000 SMEs were assisted through the implementation of 189 major development programs, which involved a total expenditure of RM4.9 billion. For the period from 2016 to May 31, 2020, a total of 322 834 SMEs have joined the e-commerce platform. Thus, SMEs have developed their businesses by ensuring that their business strategies, processes, and infrastructure are aligned and integrated to support digital transformation.

Previously, Abbad, Magboul, and AlQeisi (2022) highlight that adoption of electronic business has enormous potential for further developing deals among SMEs in developing countries. However, Rahayu and Day (2017) highlight research such as adoption of digital platform channels by SMEs is still limited in developing countries. Moreover, Jahanshahi, Zhang, and Brem (2013) conducted a study on India's and Malaysia's SMEs and found that e-commerce provided benefit to company performance but

was still considered slow as e-commerce was dubbed as a complex phenomenon. Also, previous studies by Bonera (2011) argued that adaptation of technologies such as e-commerce can be very challenging for SMEs as there is considerable uncertainty regarding the success of their continued use. Thus, e-commerce remains ambiguous, especially from SMEs' perspectives (Popovic, Puklavec, & Oliveira, 2019).

1.2. E-commerce and Small-Medium Enterprise

In recent years, e-commerce has been used by many SMEs to improve their operations and benefit their company performance (Hristov & Reynolds, 2015; Suzianti, Prisca-Faradilla, & Anjani, 2015; Theyel & Hofmann, 2015). In the SME context, e-commerce plays a unique role where companies create a major change in the retail and services industries (Jahanshahi et al., 2013). With the advancement of e-commerce, people using the internet for their purchases no longer need to be physically present when their transactions occur. It is literally different from the conventional way of doing things where customers should come to the store and review all the variety of products.

On the other hand, Irfan, Wang, and Akhtar (2019) e-commerce also benefits companies by managing business processes that are valuable, such as integrating production and expanding supplier efficiency, which affect market competitiveness. The imperative to engage in e-commerce is presented to SMEs to emphasize the need and increase business performance. Thus, the study of e-commerce is very important as technology implementation is required to meet the company's expectations, such as the growth of the company's performance (Lee & Kim, 2019). The contextual aspects that embrace e-commerce advantage in SMEs pose knowledge gaps that require further investigation to obtain a complete and wholistic understanding of SMEs' performance in an online business context.

2. Literature Review

2.1. E-commerce Advantage in SMEs' context

New research questions and challenges for research design in digital and internet developments have arisen. The uniqueness of e-commerce as a digital business platform is described as a successful channel system because it can reduce costs and cover a huge geographical channel of customers (Cliquet & Voropanova, 2016). Moreover, previous scholars have considered e-commerce as part of the innovation and operational performance of SMEs, which allows the company to emphasize product differentiation to sustain in the competitive market (see Table 1). E-commerce

encourages more creative ways to conduct business and achieve differentiation compared to competitors, making it a useful tool to inspire innovation that transmits the dynamism and digital modernity of the firm and often pushes towards an even higher level of quality (Chen & Dubinsky, 2003). In addition, the implementation of e-commerce may also have effects on other firm performance dimensions, such as innovation and operational performance. For what concerns innovation, this can be defined as the improvement of the differentiating features of products and processes that allows companies to enhance their differentiation from competitors (Gomez, Salazar, & Vargas, 2017; Hristov & Reynolds, 2015; Theyel & Hofmann, 2015).

Table 1: Benefit of using E-Commerce

Authors	Benefit associated with SMEs business
Ivana, Saso and Christopher (2016).	Digital channels on marketing has caused the interaction with the marketplaces and marketing mix.
Lin, Luo, and Luo (2019).	Effective value chain by improve connection between retailers and market demand.
Kazancoglu and Aydin, (2018).	Convey similar experiences across channels during the buying decision process.
Mellinas and Reino (2019); Barrera and Carrion (2014)	Highlight a comprehensive exhibit of products. Customers can easily compare the attributes, features and prices of different products through their devices.
Adam, Wessel, and Benlian (2021)	Value customer by providing a space for consumers interaction and engage with company.

2.2. Resource-Based View (RBV) Theory

Resource Based View (RBV) Theory was developed to complement the insufficiencies of industrial organisation in explaining the firm's performance from the internal perspective of the firm (Barney, 1991). According to RBV Theory, firms perform well and create value when they implement strategies that exploit their internal resources and capabilities. Barney, Ketchen, and Wright (2011) highlighted several resources which enhance the effectiveness and efficiency of companies, such as assets, firm attributes, organisational process, knowledge, information, and others. Thus, from all of these categories, SMEs should have implemented them in place to empower their company in order to sustain and increase their competitive advantage. Also, Barney, Ketchen, and Wright (2011) highlighted resources and capabilities in RBV Theory, which include resources of physical capital, which comprises of a firm's physical technology and equipment, such as the implementation of e-commerce. Hence, this study focuses on these resources, which particularly refer to the implementation of e-commerce for online business of SMEs in Malaysia.

2.3. Diffusion of Innovation (DOI)

According to Rogers (1983), this theory emphasises the psychological or sociological aspect in explaining and describing adoption patterns. The theory also helped in assisting and predicting the possibility of the success of a new technological invention and describing how it would be accomplished. In addition, previous research on diffusion of innovation (DOI) theory has been used to investigate the adoption of new innovation technology, particularly in digital applications (Nguyen, Nguyen, & Dang, 2020). In their study of drivers for new technology, DOI theory focuses on both internal and external organisational characteristics, as well as technological characteristics. There are five innovation characteristics, namely relative advantage, compatibility, complexity, trialability, and observability (Rogers, 1995).

Furthermore, there are numbers of literature using innovation characteristics in DOI theory and combining them with the TOE framework in the technology context (Mubarkoot & Hwang, 2016; Pei-Fang, Kenneth, Kraemer & Debora, 2006; Zhu, Dong, Xu, & Kraemer, 2006). Hence, this present study integrates the DOI theory with the TOE framework and proposes an integrated research model. However, the difference between this study and others establishes the dynamic process in the diffusion of technology, including the stages of post-adoption e-commerce advantage among SMEs' online businesses. This study is significant because it identifies the key activity in postadoption value creation through the advantage of e-commerce rather than simply adoption and penetration. The innovation diffusion theory (Rogers, 1962) can be used at either level. All these theories suggest that there are several factors that can affect the adoption and use of innovations. Most organisations make decisions about what technology to use based on its likely benefits to that organisation compared to both those of alternatives and its drawbacks (Gangwar, Date, & Ramaswamy, 2015).

2.4. Technology, Organization, Environment (TOE) Framework

A previous study of the TOE framework by Soto-Acosta, Popa, and Palacios-Marqués (2016) reported that all contexts in TOE are important in order to adopt a new innovation system or technology in the company, such as e-commerce. In particular, the TOE framework would be able to provide the subunits in an organisation that need to be focused on when a company has transformed the traditional process toward internet usage in their business (Chatterjee, Grewal, & Sambamurthy, 2002). Thus, it can be summarised that the TOE framework has been a popular foundational model used for studying the drivers

contributing to successful e-commerce initiatives from the interactions of the three characteristics, particularly in examining issues such as brand performance. In SME online business contexts, TOE is an important model to explain the technology adoption in the company and measure the firm's performance (Azadegan & Teich, 2010). The three aspects in TOE, namely technology, organization, and environment, have significant effects on firm performance in order for SMEs to succeed in their business.

3. Propositions Expanding RBV, DOI and TOE Frameworks

In the context of this study, there were several dimensions for each context in TOE, which consisted of technology context (relative advantage, compatibility, and complexity), organisational context (top management support; innovation capability, branding capability, market-sensing capability, and human and organization capability), and environmental context (government support, and supplier pressure) (see Figure 1). This study aided in the analysis of some issues related to an emerging research phenomenon, such as firm capabilities.

3.1. Technology

The decision to adopt a technology depends not only on what is available on the market but also on how such technologies fit with the technologies that a firm already possesses (Chau & Tam, 1997; Jeyaraj, Rottman, & Lacity, 2006; Tornatzky & Fleischer, 1990). In addition, previous studies by Srivastava and Teo (2010) and Wang, Wang, and Yang (2010) suggest that technology context can be explained using the theory of diffusion of innovation (DOI) (Rogers, 1995). The use of DOI in a technological context is not only consistent with the original TOE framework, but it would also improve SMEs' understanding of the importance of technology adoption in their business. According to Kendall, Tung, Chau, Ng, and Tan (2001), relative advantage, compatibility, and complexity were found to be the most frequently identified factors for innovation technology adoption. Hence, this study examines the extent to which these three DOI variables can predict e-commerce advantage success.

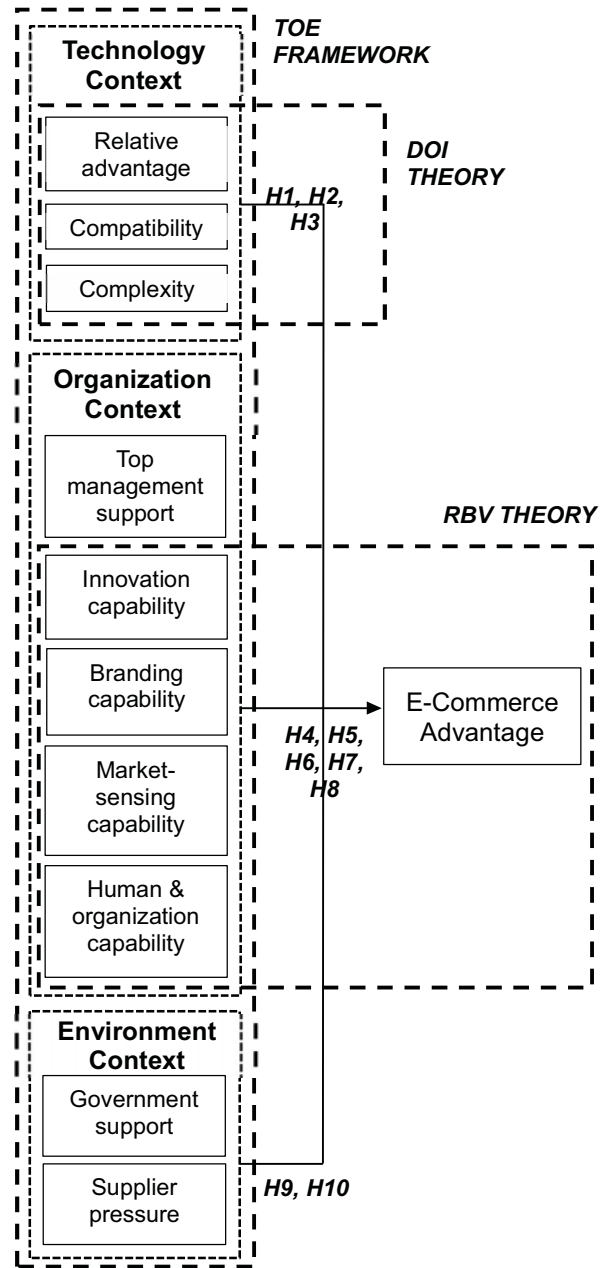


Figure 1: Proposed research framework

3.1.1. Relative Advantage

Rogers (1995) described relative advantage as "the degree to which an innovation is perceived as being better than the idea it overtakes". In addition, Okour, Chong, and Abdel Fattah (2021) found relative advantage has a positive relationship with adoption of information system technology and utilising technology in business. The researchers postulated that relative advantages mainly

embrace improving work quality and accelerating work activities. Moreover, a previous study by Alsaad, Mohamad, and Ismail (2019) found relative advantage as one of the important factors when a company decides to adopt a new innovative technology. Thus, by extending these notions, it is postulated that the role of relative advantage will positively influence the e-commerce advantage of SMEs in the online business context. Therefore, it is hypothesised that

H1: There is a positive relationship between relative advantage and e-commerce advantage

3.1.2. Compatibility

In the context of innovation technology, compatibility of innovation is perceived as being consistent with previous innovation technologies used in the company and the existing norms or values of the organisation (Rogers, 2003). Furthermore, Eze, Chinedu-Eze, and Bello (2020), and AlSharji, Ahmad, and Abdul Rahim (2017) discovered the factor towards technology used in company operation systems and found that compatibility is one of the important factors for companies using new technology such as e-commerce. In addition, Ax and Greve (2017) argued that compatibility is significant when adopting a new practise that is consistent with firms' values, beliefs, and culture in the company. Thus, it is expected that compatibility has a positive effect on e-commerce advantage for SME's in an online business context. Owing to that fact, it prompts the need for the present study to comprehensively examine compatibility towards e-commerce advantage. Therefore, it is hypothesised that

H2: There is a positive relationship between compatibility and e-commerce advantage

3.1.3. Complexity

Complexity is defined as the degree to which innovation is perceived as difficult to understand and use. The complexity of innovation, which is difficult to comprehend and apply, will force the company to learn new skills (Rogers, 1995; 2003). On reviewing complexity, Ali, Shrestha, Osmanaj, and Muhammed (2021) confirmed that complexity was a substantial factor in e-commerce adoption by SMEs. Moreover, a previous study by Michael (2014) noted that although SMEs value the importance of e-commerce, only a small number of them can create an effective e-commerce due to the complexity of web presence where the system is complicated to learn. In sum, findings from the above studies suggest the issues that need to be further examined on the influence of complexity on e-commerce advantage. Therefore, it is hypothesised that

H3: There is a positive relationship between complexity and e-commerce advantage

3.2. Organization

According to the TOE framework, organisational context is an internal factor that influences a company's adoption and implementation of innovation in their business operations (Tornatzky & Fleischer, 1990). Previous studies using the TOE framework have discussed organisational context such as organisational structure (Jeyaraj et al., 2006), and organisational support such as top management support (Sabherwal, Jeyaraj, & Chowa, 2006). However, Chiu, Bool, and Chiu (2017) described the organisational context in the TOE framework as containing the internal issues within the company, such as management and capabilities. With the rapidly changing business approach of SMEs online, organisations need to manage perceptions about themselves by reflecting a coherent image, which requires them to invest in the consistency of their internal environment (Baumgarth & Schmidt, 2010; Burmann, Zeplin & Riley, 2009; Roper & Davies, 2010). Thus, this study employed RBV theory to explore firms' capabilities such as innovation capability, branding capability, market-sensing capability, and human and organization capabilities that might affect e-commerce advantage.

3.2.1. Top management support

El-Haddadeh, Osmani, Hindi, and Fadlalla (2021) described top management support as the degree to which managers understand and take up the technological capabilities of a new technology system. The capability of top management in organization for the implementation of high specific new technologies in the company ensure the success of company's long-term vision, commitment and optimal management of resources, support in overcoming barriers and resistance to market trend (Gangwar et al., 2015; Wang et al., 2010). Moreover, Kulkarni, Robles-Flores, and Popovic (2017) found the significance of top management support towards e-commerce such as technological initiatives, participation in those initiatives, and the extent to which top management support advocates technological advancement, such as increasing investment in technology and taking the risk of using new innovative technology. Thus, by extending these notions, it is postulated that the role of top management support will positively influence the e-commerce advantage of SMEs in an online business context. Therefore, it is hypothesised that

H4: There is a positive relationship between top management support and e-commerce advantage

3.2.2. Innovation Capability

According to Maldonado-Guzmán, Garza-Reyes, Pinzón-Castro, and Kumar (2019), innovation capability is defined as the notion of openness to new ideas, new ways to do things, and creativity in its method of operation to meet market needs such as customer preference in product purchase. Hilman and Kaliappen (2015) believed that SMEs needed to be innovative in order to gain a competitive advantage and improve company performance. Moreover, in the e-commerce context, Kafetzopoulos and Psomas (2015) found innovation capability needed for further research in the context of SMEs. This fact is supported by von Koskull and Strandvik (2014), who have suggested that there is a need to analyse in more detail what is happening with the innovation capability of SMEs. The above concept can be well translated to mean that SMEs with innovation capability will have a high potential to extend their e-commerce advantage. Therefore, in this study, it is postulated that innovation capability can positively influence the e-commerce advantage of SMEs in an online business context. Thus, it is hypothesised that

H5: There is a positive relationship between innovation capabilities and e-commerce advantage

3.2.3. Branding Capability

A previous study by Renton, Daellenbach, Davenport, and Richard (2015) showed that branding capability is intra-firm branding efforts that allow enterprises to develop unique product and service competencies and lead companies to value the activities of using high technology. For instance, Lei, Ye, and Abimbola (2013) highlight the branding capability of SMEs led to high performance by using technology, which enables firms to easily control risk and respond efficiently to marketplace change. This is also supported by the study of Odoom, Agbemabiese, Anning-Dorson, and Mensah (2017) within an emerging market setting for SME's, which found that branding capability has a significant relationship with SME performance. Moreover, branding capabilities that result in perceived product quality and better relationships with customers have a significant relationship with SME performance (Hsiao & Chen, 2013). Therefore, in this study, it is postulated that branding capability can positively influence the e-commerce advantage of SMEs. Hence, it is hypothesised that

H6: There is a positive relationship between branding capabilities and e-commerce advantage

3.2.4. Market-sensing Capability

According to Teece (2007), market-sensing capability is defined as a company's ability to accumulate and interpret knowledge from the market, including customers,

competitors, and technology change. In addition, Janssen, Castaldi, and Alexiev (2016) refer to the acquisition of information on consumers, competitors, and other channel members. Previous research on SMEs by Aslam, Blome, Roscoe, and Azhar (2018) and Miocevic and Morgan (2018) found that a company's effort for market-sensing capability in an important sense contributed to the company's adaptability. It is postulated that market sensing capability tends to establish efficient and effective e-commerce by embedding this new market knowledge in business processes designed as customer and competitor. Therefore, it is hypothesised that

H7: There is a positive relationship between market-sensing capability and e-commerce advantage

3.2.5. Human and Organization Capability

Human and organization capability is defined as organisational integration in developing competence resources, strategic decision making, informational relationship-building, and developing strong human resources to support the company's engagement in technology acquisitions (Perez-Soltero & Soto, 2017). Moreover, Lin and Lee (2005) emphasised human and organization capability should take place in organizations, such as developing organisational learning and knowledge in order to adapt to a new innovation. Therefore, it is imperative to investigate the role of human and organization capability in e-commerce advantage. Thus, it is hypothesised that

H8: There is a positive relationship between human and organization capabilities and e-commerce advantage

3.3. Environment

The environmental context focuses on areas in which the firm conducts its business operations, with priority given to external factors influencing the industry that have significant impacts on the firm, such as government incentives and regulations (Lian, Yen, & Wang, 2014; Scupola, 2009). Previously, a lot of research has been done and the concept of the environment as an external factor such as competitive pressure to adopt e-commerce (Dholakia & Kshetri, 2004; Zhu, Kraemer, & Xu, 2003); trading partners such as buyers and suppliers (Grandon & Pearson, 2003; Irfan et al., 2019); and government support (Kuan & Chau, 2001; Scupola, 2005). This shows that the application of e-commerce in SMEs has become an important issue in the emerging market of online business.

3.3.1 Government Support

According to Hai and Alam Kazmi (2015), government

support includes financial and exchange policies to support the industry to guide policy support, administrative support and policy making to help business industry growth in the country. In addition, Sambajee and Dhomon (2015) found government support plays the role of the facilitator in the business environment through pro-SME policy-making, which includes providing training to enhance SME skills and financial support for business growth. Moreover, Ruilin, Aashish, and Juliana (2020) highlight that government support is important due to the growing capacity of new technologies and made policies or legislation on SMEs' online businesses. Consequently, developing policies for the online business context will help the growth of SMEs doing online business. Hence, by expending these notions, it is postulated that the role of government support will positively influence the e-commerce advantage of SMEs. Therefore, it is hypothesised that

H9: There is a positive relationship between government support and e-commerce advantage

3.3.2 Supplier Pressure

In the context of supplier pressure, e-commerce refers to an electronic approach to conducting business transactions, such as e-procurement, which refers to technology-based systems that facilitate transactions between businesses (van Weele, 2002). Previous studies by Saurabh, Yash, Ashish, and Fuli (2021) of supplier pressure on e-commerce highlight the importance of suppliers for companies when implementing e-commerce, as well as how suppliers can make or break the company's service towards customers in electronic or digital platform business. For instance, Fatao, Di, Hongxin, Huaxia, and Yuanjun (2021) highlight how e-commerce changes the dynamics of competition, specifically in supply chain management. Thus, it shows that supplier pressure has a significant impact on e-commerce advantage, especially for SME's in the context of online business. Therefore, it is hypothesised that

H10: There is a positive relationship between supplier pressure and e-commerce advantage

4. Materials and Methods

This study employed RBV Theory, TOE Framework, and DOI to develop a conceptual framework. Hence, the independent variables of this study were technology context (relative advantage, compatibility, and complexity), organization context (top management support, innovation capability, branding capability, market-sensing capability, and human and organization capability), and environmental context (government support and supplier pressure), while

the dependent variable of this study is e-commerce advantage.

The target population for this study is the SME companies in the apparel and footwear industries, which also use online platforms such as e-commerce in their business. According to the Malaysian Communication and Multimedia Commission in 2018, apparel and footwear products were recorded as the most popular online shopping products by Malaysian consumers. The respondents of this study represent the companies in order to complete the questionnaires. The respondents could be either the company's manager or executives/senior marketing/branding in those companies. The knowledge and experience gained from conducting online business will be used as the key informants in accessing the entire construct in the questionnaires toward the context of studies (Odoom, Mensah, & Asamoah, 2017; Hinton & Barnes, 2009).

The respondents of this study have been selected by using systematic random sampling. This type of sampling is a technique for creating a random probability sample in which each piece of data is chosen at a fixed interval for inclusion in the sample (Sekaran & Bougie, 2010). The data was collected from five (5) regions, which consisted of the West Coast (Kuala Lumpur/Selangor); South Coast (Johor); East Malaysia (Sarawak and Sabah); North Coast (Pulau Pinang); and East Coast (Terengganu). Moreover, the questionnaire was divided into two sets, which were set "A" for the English version and set "B" for the Malay version. The respondents were asked which language they preferred to answer and which was more convenient for them. The measurement used a five point-Likert scale ranging from "Strongly disagree" (1) to "Strongly agree" (5) to assess each item except the demographic section, where this section consists of the demographic question. Then, the data was analysed using the Statistical Package for Social Science version 25 (SPSS) and SmartPLS 3.0.

5. Results

5.1. Respondent Profile

The profile of respondents includes demographic backgrounds such as state, company status, company size, years of operation, number of employees, average sales annual turnover, and market level. The respondents' demographic profiles are tabulated in Table 2. On the other hand, the majority of respondents were *bumiputera*, which is 58.5 per cent (114 respondents) of the total. The highest percentage of respondents for company size is small companies, which is 62 per cent (121 respondents). The highest respondent's number for year of operation was 4 to 6 years, which is 43 per cent (84 respondents). Also, the

highest respondents have an average sales annual turnover of RM300,000 to RM500,000, which is 38 per cent (74 respondents). The highest respondents were those having an international market level, which is 60 per cent (117 respondents).

Table 2: Profile of Respondents

Demographic Variables	Categories	Freq.	%
Company Status	Bumiputera	114	58.5
	Non-Bumiputera	81	41.5
Company Size	Micro	74	38.0
	Small	121	62.0
Years of Operation	1 to 3 years	60	30.8
	4 to 6 years	84	43.0
	7 to 9 years	33	17.0
	10 years above	18	9.2
Average Sales Annual Turnover	< RM300000	42	21.5
	RM300000 – RM500000	74	38.0
	RM500000 – RM700000	56	28.7
	> RM700 000	23	11.8
Market Level	International	117	60.0
	Domestic	78	40.0

5.2. Common Method Bias

Common method bias happens when all data variables are collected using the same method (Podsakoff, Podsakoff, Mackenzie, Maynes, & Spoelma, 2014), potentially resulting in the artificial inflation of relationships. According to Chang, van Witteloostuijn, and Eden (2010), common method bias describes the measurement error that is compounded by the sociability of respondents who want to provide positive answers. By using Harman's single factor score, this study analyses common method bias in which all items (measuring latent variables) are loaded into one common factor. If the total variance for a single factor is less than 50%, it suggests that common method bias does not affect the data. Hence, the result shows that the extracted sum of squared loading for the first variable is 18.37%. Therefore, the data has no common method variance.

5.3. Analysis of Measurement Model

In the analysis data, the composite reliability was used to evaluate the measurement model's internal consistency reliability. The composite reliability result indicated a high level of internal consistency reliability and the value is aligned with the threshold level suggested by Nunnally and Bernstein (1994) and Hair, Hult, Ringle, and Sarstedt (2017). Thus, the results suggest that the items used to represent the constructs have satisfactory internal consistency and reliability.

As depicted in Table 3, the composite reliability for the construct of relative advantage, compatibility, complexity, top management support, innovation capability, branding

capability, market sensing capability, human and organization capability, government support, supplier pressure, and e-commerce advantage values ranged from 0.742 to 0.918.

Table 3: Internal Consistency Reliability and Convergent Validity

Construct	Items	Loadings	CR	AVE
Relative advantage	RA1	0.708	0.895	0.551
	RA2	0.799		
	RA3	0.698		
	RA4	0.776		
	RA5	0.788		
	RA6	0.635		
	RA7	0.777		
Compatibility	CMP1	0.699	0.802	0.505
	CMP2	0.652		
	CMP3	0.776		
	CMP4	0.709		
Complexity	CPX1	0.906	0.918	0.691
	CPX2	0.860		
	CPX3	0.808		
	CPX4	0.755		
	CPX5	0.820		
Top Management Support	TOP1	0.807	0.742	0.590
	TOP4	0.728		
Innovation capability	IC1	0.634	0.798	0.572
	IC3	0.837		
	IC4	0.783		
Branding capability	BC2	0.696	0.810	0.517
	BC3	0.715		
	BC4	0.684		
	BC5	0.777		
Market-sensing capability	MSC3	0.642	0.768	0.528
	MSC4	0.687		
	MSC6	0.837		
Human and organization capability	HC1	0.750	0.752	0.516
	HC3	0.873		
	HC4	0.474		
Government support	GS1	0.682	0.886	0.662
	GS2	0.875		
	GS3	0.865		
	GS4	0.817		
Supplier pressure	SP1	0.713	0.809	0.516
	SP2	0.809		
	SP3	0.884		
	SP4	0.797		

Note: RA = Relative Advantage, CMP = Compatibility, CPX = Complexity, TOP = Top Management Support, IC = Innovation Capability, BC = Branding Capability, MSC= Market-sensing Capability, HC = Human and Organization Capability, GS= Government Support, SP = Supplier Pressure, ECOM = E-Commerce advantage, CR = Composite Reliability, AVE = Average Variance Extracted.

The Average Variance Extracted (AVE) provides evidence for convergent validity (Fornell & Larcker, 1981). Specifically, Hair, Sarstedt, Hopkins, and Kuppelwieser (2014) suggested the AVE threshold level of 0.5 as the evident of convergent validity and implied that the items

loaded to the respective constructs can explain more than 50 percent of the constructs' variance. Hence, the result shows that all constructs' AVE values ranged from 0.505 to 0.691, which exceeded the recommended threshold value of 0.5. This outcome indicated that the study's measurement model demonstrated adequate convergent validity.

The study also observed the heterotrait-monotrait criterion (HTMT) to stringently assess the assessment of the construct discriminant validity (Henseler, Ringle, & Sarstedt, 2015) and also to supplement the Fornell-Larcker's criterion (1981). The examination of the Fornell and Larcker's Criterion presented in Table 4 shows that the indicators load more strongly on their own constructs than other constructs in the model. Moreover, the average variance shared between each construct and its measures is greater than the variance shared between the constructs and other constructs (Fornell & Larcker, 1981). The square root of the AVE at the diagonals was found to exceed the off-diagonal element in the corresponding row and column.

5.4. Analysis of Structural Model and Hypothesis Testing

The analysis and findings focused on the assessment of the coefficient of determination (R2), the effect size (f2), as well as the predictive relevance (Q2) of exogenous variables on an endogenous variable. According to Hair et al. (2017), the R2 value indicates the amount of variance of the dependent variable explained by the independent variables.

The acceptable value level of R2 in the context of research is considered substantial with 0.75, moderate with 0.05, and weak with 0.25. The R2 value is obtained from the SmartPLS 3.0 Algorithm function while the t-value is generated from the 500 resample bootstrapping procedure. However, according to Cohen (1988), the following cut off value for R2 score interpretation (0.26 – Substantial, 0.13 – Moderate, 0.02 – Weak).

The bootstrapping procedure has been run to get the value of the coefficient determinant (R2). The result of R2 of e-commerce advantage is 0.266. This result indicates that the exogenous variables in this study, namely relative advantage, compatibility, complexity, top management support, innovation capability, branding capability, market sensing capability, human and organization capability, government support, and supplier pressure factors, explain 26.6 percent of the variance in e-commerce advantage. After the bootstrapping procedure, the blindfolding analyses were performed to analyse the predictive relevance with the omission distance set at 7. According to Hair et al. (2017), a Q2 value larger than 0 indicates that the exogenous construct has predictive relevance over the endogenous construct. Hence, the Q2 value of 0.118 for e-commerce advantage, which is larger than 0, suggests that relative advantage, compatibility, complexity, top management support, innovation capability, branding capability, market sensing capability, human and organization capability, government support, and supplier pressure factors hold a predictive capacity or e-commerce advantage.

Table 4: Fornell and Larcker's Criterion Test

	BC	CMP	CPX	ECOM	GS	HS	IC	MSC	RA	SP	TOP
BC	0.719										
CMP	-0.083	0.710									
CPX	-0.038	-0.138	0.831								
ECOM	0.175	-0.245	0.181	0.756							
GS	0.007	-0.122	0.142	0.247	0.813						
HS	0.137	-0.226	0.084	0.282	0.151	0.718					
IC	-0.054	0.022	-0.022	-0.116	-0.008	0.242	0.756				
MSC	0.064	0.076	0.073	-0.066	0.048	0.195	0.068	0.727			
RA	-0.006	0.036	-0.029	-0.190	-0.200	-0.185	-0.003	-0.148	0.742		
SP	0.024	-0.044	0.028	0.250	0.092	0.171	-0.095	0.004	-0.039	0.718	
TOP	0.069	-0.005	-0.093	-0.020	-0.089	-0.028	0.151	0.050	0.123	-0.033	0.768

Note: RA indicated Relative Advantage; CMP indicated Compatibility; CPX indicated Complexity; TOP indicated Top Management Support; IC indicated Innovation Capability; BC indicated Branding Capability; MSC indicated Market Sensing Capability; HC indicated Human and Organization Capability; GS indicated Government Support; SP indicated Supplier Pressure; ECOM indicated E-Commerce advantage.

According to Cohen (1988), the effect size suggests the following cut-off value: 0.02 has a small effect size, 0.15 has a medium effect size, and 0.35 has a large effect size. All the variables of technology context, relative advantage (f2 = 0.022), compatibility (f2 = 0.019), and complexity (f2 =

0.023), have a medium effect size on e-commerce advantage. In addition, the effect size of variables in an organization context on e-commerce advantage was reported as having a small effect on e-commerce advantage, while innovation capability (f2 = 0.022), branding capability (f2 = 0.023),

market sensing capability ($f^2 = 0.023$), and human and organization capability ($f^2 = 0.046$) were reported as having a large effect on e-commerce advantage. Furthermore, the environmental context on e-commerce advantage shows that government support ($f^2 = 0.028$) has a medium effect size, while supplier pressure ($f^2 = 0.038$) has a large effect on e-commerce advantage.

The result of direct effect of this study has been shown in Table 5. The supported hypothesis including H3) the positive relationship between complexity and e-commerce advantage ($\beta=0.134$; $t=1.977$; $p<0.05$), H6) the positive relationship between branding capability and e-commerce advantage ($\beta=0.134$; $t=1.804$; $p<0.05$), H8) the positive relationship between human and organization capability and e-commerce advantage ($\beta=0.208$; $t=2.646$; $p<0.05$), H9) the positive relationship between government support and e-commerce advantage ($\beta=0.148$; $t=1.863$; $p<0.05$), and H10) the positive relationship between supplier pressure and e-commerce advantage ($\beta=0.172$; $t=2.781$; $p<0.05$). In addition, there are four hypotheses have negative significant relationship with e-commerce advantage; H1 with value of $\beta= -0.133$; $t=2.781$; $p<0.05$; H2 with value of $\beta= -0.124$; $t=2.481$; $p<0.05$; H5 with value of $\beta= -0.134$; $t=2.039$; $p<0.05$; and H7 with value of $\beta= -0.137$; $t= 1.658$; $p<0.05$. In the other hand, hypotheses 4 are not supported which is H4) the positive relationship between top management support and e-commerce advantage ($\beta=0.051$; $t=0.577$; $p>0.05$).

6. Discussion

This study's result has revealed that complexity has a positive relationship with e-commerce advantage. In retrospect, the respondents of the study are aware that the growth of technology has tremendously boosted a company's performance and that they are also critical in order to develop and adopt e-commerce. However, e-commerce turned out to be complex for SMEs to use and transform business operations from an offline to an online platform, and this finding has evidently been proven by previous research by Bharadwaj, El Sawy, Pavlou, and Venkatraman (2013), and Avermaete, Viaene, Morgan, and Crawford (2003). However, relative advantage and compatibility are found to have a negative significant relationship. These findings support the studies of Parry and Wilson (2009) and Ntemana and Olatokun (2012). As a result, the findings suggest that SME resistance to e-commerce may exist, owing to the fact that the barriers appear to be greater than the benefits. SME's require substantial training or learning where e-commerce is seen as difficult for the company.

Table 5: Results of Hypothesis Testing

Hypothesis	Std. Beta	t	p	Decision
H1	-0.133	2.781	0.003	Not Supported
H2	-0.124	2.481	0.007	Not Supported
H3	0.134	1.977	0.044	Supported
H4	0.051	0.577	0.282	Not Supported
H5	-0.134	2.039	0.021	Not Supported
H6	0.134	1.804	0.036	Supported
H7	-0.137	1.658	0.049	Not Supported
H8	0.208	2.646	0.004	Supported
H9	0.148	1.863	0.032	Supported
H10	0.172	2.781	0.003	Supported

With regard to organisational context in the TOE framework, top management support was found to have a negative relationship with e-commerce as proved by a previous study by Hsu, Liu, Tsou, & Chen (2019). Remarkably, this study postulated that top management support is not a strong reason for shaping favourable e-commerce advantage. Moreover, this study found branding capability and human and organization capability have positive significant relationship with e-commerce advantage. These findings are supported by Morgan, Slotegraaf, and Vorhies (2009), and Lofsten (2016). Likewise, branding capability enables companies to translate their value propositions of products into tangible and intangible benefits for their customers using the digital channel of e-commerce. Also, SME's are aware of the importance of technology-intensive skills, which require resources and capabilities other than actual technology to deliver new knowledge in an organization. However, innovation capability and market-sensing capability are found to have a negative significant relationship with e-commerce advantage. These findings are not consistent with Macchion, Moretto, Caniato, Caridi, Danese, and Vinelli (2017), Lin and Wang (2015), Roberts and Grover (2012), and Schilke and Goerzen (2010). Hence, this current study suggests future studies for deep understanding where innovation capability and market-sensing capability are important factors for SME's growth (Battor & Battor, 2010).

In environment context, government support and supplier pressure have a significant positive relationship with e-commerce advantage. Thus, the government plays an important role in ensuring SMEs have properly used e-commerce for their business purposes. Furthermore, supplier pressure is important to motivate the company to be more efficient in their supply chain management where they need to balance the use of e-commerce by suppliers and their company. These findings support the studies of Oliveira, Thomas, and Espadanal (2014), and Patterson, Grimm, and Corsi (2004).

7. Conclusion and Implication

The current study presents a detailed investigation of factors that influence the e-commerce advantage of SMEs in Malaysia, specifically those companies that conduct online business. In this study, there are three important theories that have been employed to develop the framework of the study. It consists of three components: Resource-Based View (RBV), Technology, Organization, and Environment Framework (TOE), and Diffusion of Innovation Theory (DOI). Theoretically, the findings of this current study were empirically proven using the TOE framework, which provided a mechanism to understand the technology context dimension from DOI theory, which consisted of relative advantage, compatibility, and complexity that prompt the e-commerce advantage of SMEs online businesses in Malaysia. Interestingly, this study also contributed to the further development of the TOE framework by confirming which dimensions are significant in an e-commerce advantage study as digital channels with SMEs online business where relative advantage and compatibility are found to have a significant negative relationship towards e-commerce advantage.

From the perspective of practicality, the current study empirically showed that SMEs understand the importance and the effect of e-commerce advantage, which would highly align with a company's performance. Thus, the abovementioned notion offers a clear sign that the digital channel appeals to Malaysian SMEs regardless of their size and level of operation in the industry. In addition, the variable of organization context in this study recognises that SMEs with a digital channel approach should focus more on important resources and firm capabilities (branding capability and human and organization capability), which is in line with the emerging digital and internet market environment. Further, SMEs should take into account organization capabilities in order to extend the value activities of the digital channel and increase company performance.

8. Limitation and Recommendation for Future Research

The extent to which this study's findings can be generalised also served as another limitation because the sample was drawn from certain areas of states in Malaysia. Data collection by region is based on the online business population, as referred to in the SME Corp. Malaysia report. Therefore, the limitations of this study can be improved by leveraging the number of data collection areas that have been identified with online business population growth. Nevertheless, the findings of this study and future studies on

similar topics could have a richer outcome as they differ in terms of data collection areas and their results could be more conclusive on the e-commerce success of Malaysian SMEs.

In an attempt to extend the research paradigm to SMEs in an online business context, future research could adopt the conceptual model of the current study for further investigation of other types of online business products or services by SMEs. It is very important and worthwhile to understand further the various types of products offered in online business, such as electronic products, homeware and furnishing products, personal accessories and eyewear, home improvement and gardening, and media products. There are various products and services offered using digital platforms and internet access in Malaysia. This development will also definitely change the market landscape, such as firms' capabilities, competition, and environment. On the other hand, customer demand is dynamic and changes according to market trends. Therefore, SMEs would reflect on their plans and strategies towards market trends. Hence, an in-depth study of various product types will be able to assist the development of SMEs in Malaysia to increase productivity.

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