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E-COMMERCE FOR MALAYSIAN
SMEs IN SELECTED SERVICES:
BARRIERS AND BENEFITS

THAM SIEW YEAN AND
ANDREW KAM JIA YI

ISEAS YUSOF ISHAK
INSTITUTE

Trends in Southeast Asia

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FOREWORD

The economic, political, strategic and cultural dynamism in Southeast Asia has gained added relevance in recent years with the spectacular rise of giant economies in East and South Asia. This has drawn greater attention to the region and to the enhanced role it now plays in international relations and global economics.

The sustained effort made by Southeast Asian nations since 1967 towards a peaceful and gradual integration of their economies has had indubitable success, and perhaps as a consequence of this, most of these countries are undergoing deep political and social changes domestically and are constructing innovative solutions to meet new international challenges. Big Power tensions continue to be played out in the neighbourhood despite the tradition of neutrality exercised by the Association of Southeast Asian Nations (ASEAN).

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E-commerce for Malaysian SMEs in Selected Services: Barriers and Benefits

By Tham Siew Yean and Andrew Kam Jia Yi

EXECUTIVE SUMMARY

- Findings from a recent survey done to identify the barriers and benefits of e-commerce for Malaysian SMEs in the retail and food and beverage services indicate that both e-commerce adopters and non-adopters are similar in that they perceive the CEO or decision-maker to be the most important factor in the adoption of e-commerce.
- The relative importance of the other three main factors (namely, organizational, technological and environmental) differ for adopters and non-adopters. Likewise, there are also differences in response based on firm size.
- Based on the survey findings, Malaysia needs to shift from one-size-fits-all strategies to a more nuanced policy response that addresses the differences in perceived barriers of adopters and non-adopters and which is also cognizant of firm size.
- Grant recipients are more concerned about technological and environmental factors, indicating that grants need henceforth to be accompanied by appropriate policies that address these two barriers.
- The perceived benefits focus more on the domestic market than on exports. Getting firms to invest in e-commerce does not automatically lead to export. Exporting via e-commerce requires complementary policies that focus on specific issues, such as digital marketing at the targeted export destination.

E-commerce for Malaysian SMEs in Selected Services: Barriers and Benefits

By Tham Siew Yean and Andrew Kam Jia Yi¹

INTRODUCTION

In 2018, it was estimated that 98.5 per cent of business establishments in Malaysia are micro, small and medium enterprises (SMEs).² By size, 76.5 per cent of these are micro enterprises, 21.2 per cent are small, while the remainder (or 2.3 per cent) are medium. SMEs are considered the backbone of the Malaysian economy as they contribute to as much as 66 per cent of total employment in the country in 2017. However, they only contribute up to 38.3 per cent of the gross domestic product (GDP) of the country in 2018 while their share in export revenues was only 17.3 per cent in 2017.³

Given the domestic orientation of the SMEs, the government has initiated numerous initiatives to facilitate SMEs to penetrate the

¹ Tham Siew Yean is Senior Fellow at ISEAS – Yusof Ishak Institute, Singapore, and Andrew Kam Jia Yi is Senior Fellow at Institute of Malaysian and International Studies, Universiti Kebangsaan Malaysia. The authors would like to thank ISEAS – Yusof Ishak Institute for funding the survey and Malaysia External Trade Development Corporation (MATRADE), SME Association of Malaysia and the Malaysia Retailers Association for their kind cooperation in the execution of the survey in Malaysia.

² SME Corp., “Contribution of SMEs in 2018”, (undated), <http://www.smecorp.gov.my/index.php/en/policies/2015-12-21-09-09-49/sme-statistics> (accessed 7 November 2019).

³ SME Corp., *Annual Report 2017/18*, (2018), <http://smecorp.gov.my> (accessed 7 November 2019).

export market. For example, the SME Masterplan (2012–20) that was launched in 2012 targets to increase the share of exports of SMEs to 23.0 per cent by 2020. E-commerce is promoted by the government as a platform to facilitate exports since it can reduce the fixed costs incurred for exporting by removing the need to establish a physical presence in export destinations. It is also perceived to lower transactions costs such as search and information costs and the costs of coordinating buyers with sellers. The migration to e-commerce is also perceived to reduce the use of intermediaries such as middleman in distributing goods and services.⁴

The Digital Free Trade Zone (DFTZ) launched in 2017 is another key initiative used to encourage SMEs to use e-commerce to penetrate the export market. But, be that as it may, SMEs see themselves being hampered by various barriers and challenges in the adoption of e-commerce. A survey conducted by SME Corp and Huawei Technologies⁵ reported that about one-third of the total respondents (2,033) throughout the country do not plan to use e-commerce (mainly in manufacturing and construction) because they do not think that it is necessary for their business and they prefer to keep to traditional ways of doing business.

The various factors identified in the literature as causes for SMEs' reluctance to adopt e-commerce can be broadly classified as internal and external barriers. Internal barriers can be resolved within the organization by the organization itself, while external barriers may need government intervention. Identifying external barriers will therefore have important policy implications.

In general, the benefits (both tangible and intangible) post-adoption are not well known and are simply assumed as a given gain. It should however be properly considered that understanding these specific benefits are important and will serve to motivate e-commerce adoption for SMEs.

⁴ Punithaa Kylasapathy, Tng Boon Hwa and Ahmad Haris Mohd Zukki, "Digital Future: Opportunities, Challenges and Policy Responses", Economics Department, Central Bank Malaysia, March 2018.

⁵ SME Corp., *Annual Report 2017/18*, p. 45.

This study examines e-commerce adoption by SMEs in Malaysia. Specifically, it aims to identify the main barriers faced by SMEs in e-commerce adoption as well as the key post-adoption benefits. Although a few studies have been conducted for Malaysia, none have specifically focused on the services sector, particularly in retail and food and beverage services.⁶ This is surprising, considering that 89.2 per cent of Malaysia's SMEs are found in the services sector.⁷ In terms of sectoral contribution to SME GDP in 2017, the services sector was the largest contributor and was responsible for 59.7 per cent of total SME GDP. The wholesale and retail trade, food and beverage (F&B) and accommodation subsectors which accounted for 62.3 per cent of SME value-added in the services sector grew at the fastest pace—at 7.5 per cent in 2017.⁸ More importantly, growth was underpinned by the retail trade and motor vehicle segments. Facilitating the SMEs in retail services to adopt e-commerce can expand their market opportunities since retail sales from e-commerce is presently estimated at about 2 per cent, which is much lower than China's at 10 per cent, the United States at 9.2 per cent and South Korea at 16.3 per cent.⁹

ANALYTICAL FRAMEWORK AND SURVEY

The literature suggests various approaches that can be used to explain technology adoption, including e-commerce adoption by SMEs. The

⁶ See, for example, Noor Azuan, "E-commerce Adoption by Malaysian SMEs" (Thesis submitted to University of Sheffield for the Degree of Doctor of Philosophy in the Faculty of Social Sciences, 2012), <https://pdfs.semanticscholar.org/bd0f/755c4390e6c3510a6b8b7038472cflcacee6.pdf> (accessed 5 September 2019), and Syed Shah Alam, Md. Yunus Ali and Mohd. Fauzi Mohd. Jani, "An Empirical Study of Factors affecting Electronic Commerce Adoption among SMEs in Malaysia", *Journal of Business Economics and Management* 12, no. 2 (2011): 375–99.

⁷ SME Corp. "Contribution of SMEs in 2018", p. 1.

⁸ SME Corp., *Annual Report 2017/18*, p. 22.

⁹ *Malaysian Reserve*, "Malaysia Still Lags in Retail E-commerce", 21 September 2019, <https://themalaysianreserve.com/2019/02/21/malaysia-still-lags-in-retail-e-commerce/> (accessed 7 November 2019).

most common are the Technology Acceptance Model (TAM),¹⁰ Theory of Planned Behavior (TPB),¹¹ Unified Theory of Acceptance and Use of Technology (UTAUT),¹² Diffusion of Innovation (DOI)¹³ and the Technology-Organization-Environment (TOE) framework.¹⁴ A review of the literature indicates that the majority of empirical studies refer to DOI (Rogers model) as well as the TOE framework. The DOI model is recognized by many researchers as being able to identify “perceived” critical characteristics of technological innovations (such as relative advantage, compatibility, complexity, observability and trial-ability) that may influence the attitude of potential adopters or rejecters. It was however argued that the Rogers model need to take into consideration other contexts or factors. Based on this argument, the TOE framework includes the environment context (not included in the DOI theory) and is considered to be more complete in terms of explaining technology adoption at the firm level.

The TOE framework is chosen as the theoretical basis for the development of the survey instrument used in this study. This choice is based on several considerations. Firstly, the TOE framework has been widely recognized by previous studies as a well-established framework for studying e-commerce adoption. Secondly, it takes various contexts into consideration, rather than just the technological context. Thirdly, the TOE framework employs an interactive perspective that assumes that the

¹⁰ F. Davis, “Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology”, *MIS Quarterly* 13 (1989): 319–40, <https://doi.org.10.2307/249008>.

¹¹ I. Ajzen, “The Theory of Planned Behavior”, *Organizational Behavior and Human Decision Processes* 50, Issue 2 (1991): 179–211.

¹² V. Venkatesh, M.G. Morris, G.B. Davis, and F.D. Davis, “User Acceptance of Information Technology: Toward a Unified View”, *MIS Quarterly* 27 (2003): 425–78.

¹³ E. Rogers, *Diffusion of Innovations*, 4th ed. (New York: The Free Press, 2003).

¹⁴ L. Tornatzky and M. Fleischer, *The Process of Technology Innovation* (Lexington: Lexington Books, 1990).

changes in an organization are determined not only by individuals in an organization but also by the characteristics of the organization in which they operate.¹⁵ This interactive perspective allows the researcher to treat all the factors and their interaction in one dynamic framework.¹⁶

Nevertheless, there are still criticisms against this theory, the most important of which is that the model ignores factors related to individual attributes concerning employees and managers. Therefore, in this present study, in addition to taking into account technological, organizational, and environmental contexts, we also consider relevant factors relating to the individual which can affect SMEs adoption of e-commerce. In this regard, Thong¹⁷ has extended the TOE theory, based on SMEs' highly centralized structures, whereby the CEOs or owner/managers make most of the critical decisions. Consequently, Thong conceptualized and verified the importance of a fourth dimension (besides technological, organizational and environmental), which has been classified as CEO's characteristics. Thong's study differs from most of the other studies in having added the characteristics of the decision-makers into the organizational context.

Following Thong, other studies such as Al-Qirim's¹⁸ also distinguished the decision-maker context from the organizational context by using the extended TOE framework with four dimensions: decision-makers, technological, organizational and environmental context (DTOE). It is

¹⁵ M.A. Hameed, S. Counsell and S. Swift, "A Conceptual Model for the Process if IT Innovation Adoption in Organizations", *Journal of Engineering and Technology Management* 29, no. 3 (2012): 358–90.

¹⁶ A. Molla and P.S. Licker, "E-Commerce Adoption in Developing Countries: A Model and Instrument", *Information & Management* 42 (2005): 877–99.

¹⁷ James Y.L. Thong, "An Integrated Model of Information Systems Adoption in Small Businesses", *Journal of Management Information Systems* 15, no. 4 (1999): 187–214, <https://doi.org.10.1080/07421222.1999.11518227>

¹⁸ N.A. Al-Qirim, "E-commerce Adoption in Small Businesses: Cases from New Zealand", *Journal of Information Technology Case and Application Research* 9, no. 2 (2007): 28-57, <https://doi.org.10.1080/15228053.2007.10856111>

this model that acts as the conceptual framework for the formulation of the survey instrument used in this study.

The items in each variable are chosen based on the empirical literature that used the same framework in other countries, as well as studies on Malaysia. The preliminary questionnaire was presented to relevant stakeholders for feedback. A pilot study based on the adjusted questionnaire was conducted. Subsequently, the Cronbach's Alpha test was conducted, and this confirmed that the questionnaire had good internal consistency as it had an alpha above 0.8. The survey instrument was then translated into Malay and Mandarin for the ease of usage by SMEs where required. Some questions were revised according to the response from the pilot study before being emailed to the targeted respondents. The survey was initially based on a stratified sample of SMEs in food and beverage and retail services in Selangor done by the Department of Statistics.¹⁹ However, the response was exceedingly poor and, subsequently, Malaysia External Trade Development Corporation (MATRADE), SME Association of Malaysia and the Malaysia Retailers Association also participated in the survey which was conducted over a period of nine months from May 2018 to January 2019. Although the survey response improved, many of the questionnaires were incompletely answered. The survey was in the end completed in August 2019 only after face-to-face interviews were conducted with willing respondents at shopping malls and retail outlets in the Klang Valley.

SURVEY FINDINGS

Profile of Respondents

A total of 204 firms in the food and beverages (F&B) and retail services responded to the survey questionnaire.²⁰ Table 1 shows the

¹⁹The final survey instrument is available upon request from the authors.

²⁰ Almost 70 per cent of the respondents are from the retail industry. Our respondents include 39 firms which are manufacturers who sell their own F&B and retail products.

Table 1: Profile of the Respondents

<i>SME classification*</i>	<i>Frequency</i>	<i>%</i>
Micro (<5 employees)	138	67.6
Small (6–75 employees)	59	28.9
Medium (76–200 employees)	7	3.4
<i>Total</i>	204	100.0

<i>Age of the enterprise (Median age = 8 years, Min = 1, Max = 51)</i>	<i>Frequency</i>	<i>%</i>
8 years and below	104	51.0
9 years and above	100	49.0
<i>Total</i>	204	100.0

<i>Sales revenue per year</i>	<i>Frequency</i>	<i>%</i>
Less than RM300,000	106	52.0
RM300,000 to RM3 million	74	36.3
RM3 million to less than RM20 million	20	9.8
RM20 million and above	4	2.0
<i>Total</i>	204	100.0

Note: * Malaysia SME classification based on number of employees.

Source: Tabulated from survey results.

characteristics of the respondents. More than 67 per cent are micro enterprises while 29 per cent and 3.4 per cent, respectively, are small and medium enterprises. The age of firms ranges from one to fifty-one years. Taking the median age of enterprises (eight years), there are 104 enterprises (or 51 per cent) below eight years old while 100 (or 49 per cent of the respondents) are above the median age. More than half of the enterprises (52 per cent) have an annual sales revenue of RM300,000 and below, while only four enterprises have an annual sales revenue of RM20 million and above.

More than 70 per cent of the respondents use the Internet (Table 2), primarily for marketing and information collection purposes. Less than 50 per cent of the enterprises use the Internet for sales and purchase, while only 44 per cent utilized it for payment transaction.

Table 2: Internet Usage and Purpose

<i>Use of Internet</i>	<i>Frequency</i>	<i>%</i>			
No	55	27.0			
Yes	149	73.0			
<i>Total</i>	204	100.0			
<i>Purpose</i>		<i>Yes</i>	<i>No</i>	<i>N/A*</i>	<i>Total</i>
1. Information collection	<i>Frequency</i>	106	43	55	204
	<i>%</i>	52.0	21.0	27.0	100.0
2. Marketing	<i>Frequency</i>	123	26	55	204
	<i>%</i>	60.3	12.7	27.0	100.0
3. Sell and purchase	<i>Frequency</i>	100	49	55	204
	<i>%</i>	49.0	24.0	27.0	100.0
4. Payment transaction	<i>Frequency</i>	90	59	55	204
	<i>%</i>	44.1	28.9	27.0	100.0
5. Others	<i>Frequency</i>	0	149	55	204
	<i>%</i>	0	73.0	27.0	100.0

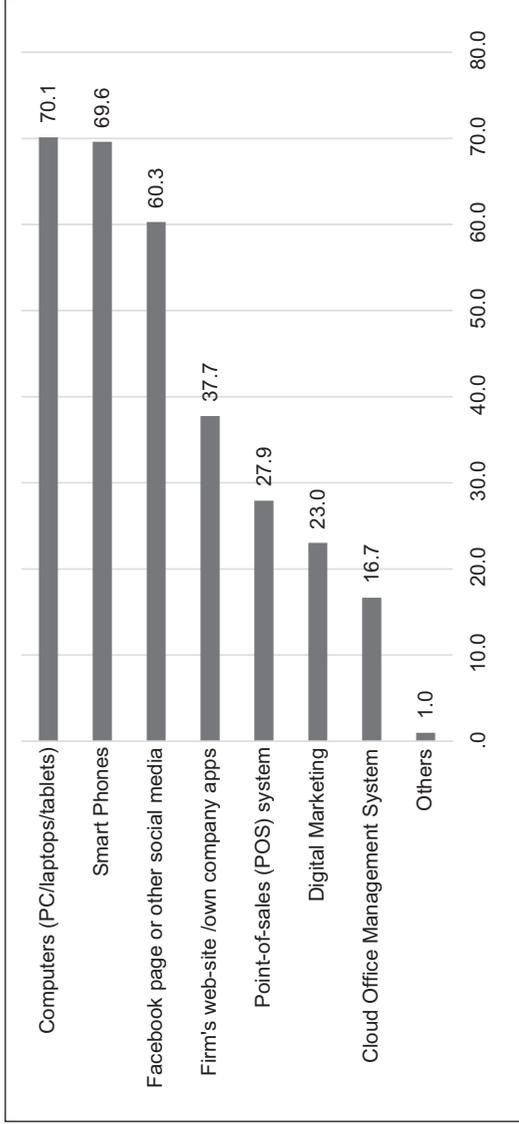
Note: N/A*: The respondents did not pick this option.

Source: Tabulated from survey results.

In terms of hardware, most firms are equipped with computers and smartphones (Figure 1). While social media pages (namely Facebook) are widely used (60.3 per cent), less than 38 per cent own a company website or has any company applications (apps). An even lower number of firms have a Point-of-Sales (POS) system or digital marketing campaigns. The survey also shows that Cloud Office Management System is the least used technology.

Almost 50 per cent of the CEO/Owner/Manager in the survey are aged between 36 to 53 years old, with the youngest being 18 and the oldest 72 (Table 3). There are more male CEOs in the sample compared to females, with a ratio of 60:40. Approximately half (49.5 per cent) of these CEO/Owner/Manager hold a university bachelor's degree and above. Table 4 further shows that most leaders of the responding companies have an educational background in Economics, Accounting, and Business Administration. This is followed by Science, Information Technology

Figure 1: Available Technology in Firm (%)



Source: Survey results.

Table 3: Profile of CEO/Owner/Managers

<i>Age of the CEO</i>	<i>Frequency</i>	<i>%</i>
18–35	68	33.3
36–53	99	48.5
54–72	37	18.1
<i>Total</i>	204	100.0

<i>Gender of CEO</i>	<i>Frequency</i>	<i>%</i>
Male	134	65.7
Female	70	34.3
<i>Total</i>	204	100.0

<i>Highest Education Level by CEO/Owner/ Senior Manager</i>	<i>Frequency</i>	<i>%</i>
School Level (Grades 1–12)	63	30.9
Diploma (High Vocational/Technical Certificate)	40	19.6
University (Bachelor’s degree)	67	32.8
Post-Graduate (Master’s degree)	31	15.2
Doctorate (PhD/Doctoral Degree)	3	1.5
<i>Total</i>	204	100.0

Source: Survey results.

(IT), & Engineering. Survey results also show a smaller number of CEO/Owner/Manager to have graduated from disciplines such as Other Social Science and Humanities.

E-commerce Adoption

In this study, we have defined an e-commerce transaction as the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders. Based on this definition, the number of e-commerce users or adopters (53 per cent) and non-users or non-adopters (47 per cent) are almost equally distributed among the total number of respondents (Table 5).

Table 4: Degree Field of CEO/Owner/Senior Manager

	Science, Information Technology (IT), & Engineering	Economics, Accounting, & Business Administration	Other Social Science & Humanities	Others	Total
University (Bachelor's degree)	22	29	4	12	67
Postgraduate (Master's degree)	9	13	2	7	31
Doctorate (PhD/doctoral degree)	2	1	0	0	3
<i>Total</i>	33	43	6	19	101

Source: Survey results.

Table 5: E-commerce Adoption

	<i>Frequency</i>	<i>%</i>
E-commerce user (A+B)	109	53.4
Firms conducting sales/purchase through:		
(A) Only online	1	0.5
(B) Online and offline	108	52.9
Only offline/non-e-commerce user	95	46.6
<i>Total</i>	204	100.0

Source: Survey results.

Of the 109 users, 106 (97 per cent) have used e-commerce for less than ten years (Table 6). Interestingly, only a small number of firms (18 per cent) became adopters with the help of the government’s e-commerce grants. E-commerce users deal mostly in the business to customer (B2C) market even though studies have shown that business to business (B2B) has a larger marketplace.²¹ The small amount of B2B transactions from our sample suggests that there is a need to enhance e-commerce adoption in the upstream segment of the F&B and retail industry. Business to government (B2G) transaction has the smallest share in the e-commerce transactions of the respondents.

The average export revenue is small relative to their respective total sales revenue. This implies that e-commerce users conduct their business mostly in the domestic market. Even if they are exporters, the exports revenue generated through e-commerce is but a very small component (on average 6 per cent) of total exports.

CEO/Owner/Manager, aged between 36 to 53, are the highest number of e-commerce users. This is followed by “younger” CEO/Owner/Manager (age from 18 to 35). Comparing adopters and non-adopters, there are more non-adopters in the older cohort (age 54 and above).

²¹ S. Agarwal, C. Holland and G. Blissett, *Wholesale Distribution Disrupted* (Deloitte, 2016).

Table 6: Profile of E-commerce Users

1. Years using e-commerce			
10 Years and Below	97.2 % of Total (109)		
11 Years and Above	2.8 % of Total (109)		
2. Received incentive or grant for using e-commerce	18.3 % of Total (109)		
3. Average e-commerce sales revenue classified by type of e-commerce transactions as a % of the total			
business to business (B2B)	16.2%		
business to consumer (B2C)	80.4%		
business to government (B2G)	2.6%		
4. Average e-commerce export revenue:			
as percentage of total sales revenue	7.5%		
as percentage of total export revenue	6.0%		
5. CEO/Owner/Manager's Age:			
	<i>No. of E-commerce Adopter/Users</i>	<i>No. of Non E-commerce Adopter/Users</i>	<i>Total</i>
18-35	43	25	68
36-53	52	47	99
54-70	14	23	37
<i>Total</i>	109	95	204

Source: Survey results.

Comparing the levels of adoption between e-commerce users and non-users, most non-users do not have an interest in using e-commerce platforms (Table 7). Around 34 per cent are interested in using e-commerce but do not know how to adopt it while only 28 per cent of the total response from non-users plan to use e-commerce within two years.

As for e-commerce users, the level of adoption varies. Most of them (26.3 per cent) have their own interactive website. An equally large number of respondents (25.5 per cent) indicated that they have online payment facilities for e-commerce transactions. Mobile commerce (M-commerce) seems to be lagging in usage, compared to websites. The total number of users adopting M-commerce (be it with or without an online payment system) is still smaller compared to the use of websites for e-commerce. A small number of users also outsourced their e-commerce activities to third-party providers. The most common e-commerce platform used is social media (e.g., Facebook, Instagram, etc.). This is followed by the company's own website or apps. E-market places (e.g., Lazada, Shopee, Tokopedia) are also utilized.

IDENTIFYING BARRIERS TO E-COMMERCE ADOPTION

Based on the extended TOE framework, there are four main factors that may hinder the usage of, or better adoption of, e-commerce applications: these are technological, organizational, environmental and CEO/manAGERIAL perceptions.²² In this section, we consider responses from both e-commerce users (or adopters) and non-e-commerce users (or non-adopters).

²² Technological factors include technological infrastructure to support e-commerce activities and security issues to safeguard transactions. Organization factors are elements within the firm which may affect e-commerce usage (i.e., firm size, suitability of products for e-commerce transaction and human capital constraints). Environmental factors include external drivers, i.e., government incentives, market competition, and regulations. Finally, CEO/Owner/Senior Management's view is self-explanatory.

Table 7: Levels of E-commerce Adoption

<i>A. Non e-commerce users</i>	<i>Total Number of Responses*</i>	<i>%</i>
Not interested in using any e-commerce platforms	40	38.1
Interested in using e-commerce, but don't know how to adopt it.	36	34.3
Planning to use e-commerce within the next 2 years	29	27.6
<i>Total</i>	105	100
<i>B. E-commerce users</i>		
Own website, static, or there is no interaction with customers	44	18.1
Own website, interactive, that is using it to communicate with customers	64	26.3
Online payment facilities for e-commerce transactions	62	25.5
Outsourced to third-party providers	26	10.7
Mobile commerce (M-commerce) without on-line payment system	16	6.6
M-commerce with on-line payment system	31	12.8
<i>Total</i>	243	100
<i>C. Types of e-commerce platforms</i>		
E-market places (e.g., Lazada, Shopee, Tokopedia)	47	23.6
Own website/applications	54	27.1
Social Media (e.g., Facebook, Instagram, Line, WA,)	91	45.7
Food delivery platforms (e.g., Grabfood)	6	3.0
Other online platforms	1	0.5
<i>Total</i>	199	100

Note: *Respondents are allowed to answer more than one option. Hence, the analysis is based on the frequency of the options selected.

Source: Survey results.

Figures 2A and 2B compare the overall importance of the four factors between adopters and non-adopters. Analysing “somewhat important” and “most important” together as the criteria for picking out the most important perceived barriers, both users and non-users have ranked CEO/Owner/Senior Management views as the most important barrier to e-commerce adoption. As implied by Figure 2, leadership is the most important catalyst for e-commerce adoption since decision-making rests on the leader of the company, especially for SMEs.

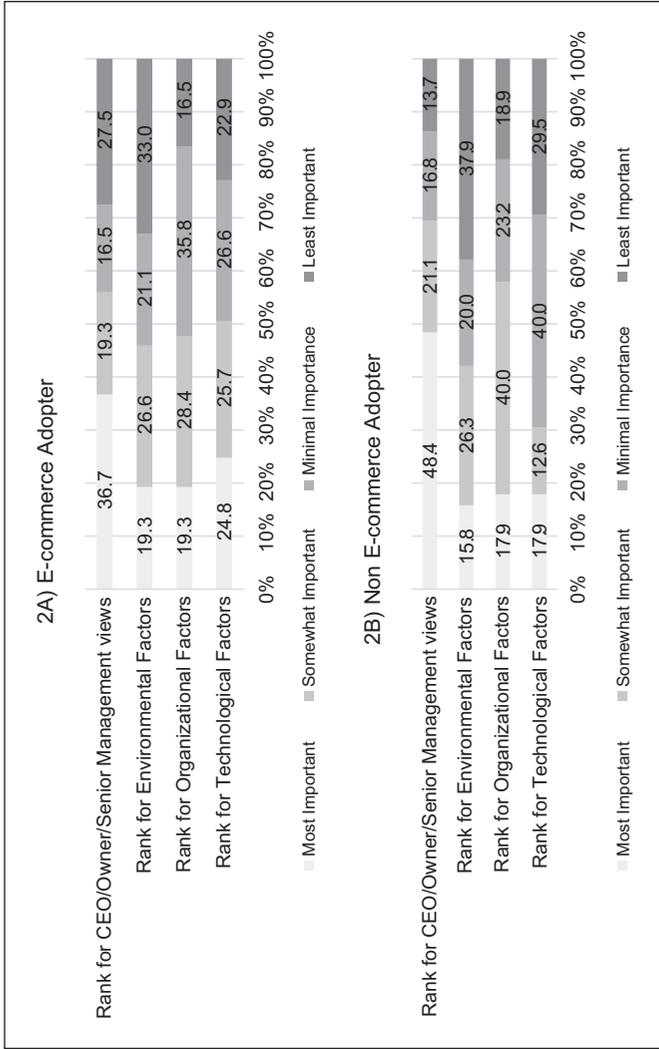
For adopters, this is followed by technological and organizational factors, while the least important factor is the environmental factor. Organizational factors are deemed to be more important than technological factors for non-adopters. This may be due to non-adopters’ perception that internal “readiness” to adopt (i.e., scale, human resource) is more important than the type of technologies to be adopted. Technological factors are also perceived as less important barriers for non-adopters compared to environmental factors.

The details of the importance of each item in the four main factors are shown in the Appendix (Figures A1 to A4). Table 8 provides a summary of the key barriers²³ out of all the items listed in each of the four main factors. In the case of the CEO/Owner/Senior Management factor, lack of knowledge is the key barrier, as they are still learning about e-commerce transactions and markets. This is the case for both adopters as well as non-adopters. On organizational barriers, both adopters and non-adopters encounter financial and human constraints in e-commerce activities. 74 per cent of the respondents who have not adopted e-commerce strongly agree that they have limited financial/human resources for venturing into e-commerce activities compared to 51 per cent by e-commerce adopters.

Adopters and non-adopters, however, face different technological barriers (Table 8). The former group is more worried about security issues that are related to hacking and malware than security issues with regards

²³ Key barriers are defined as the item with highest percentage of responses of “somewhat agree” and “strongly agree”.

Figure 2: Barriers by the Order of Importance between Adopters and Non-adopters (% of Total Response across Factors)



Source: Survey results.

Table 8: Summary of Key Barriers to E-commerce Adoption Found in Each of the Four Main Factors

<i>Four Main Factors</i>	<i>Adopters</i>	<i>Non-Adopters</i>
1. CEO/Owner/Senior Management	<ul style="list-style-type: none"> • Still learning about e-commerce transactions and markets (69%). 	<ul style="list-style-type: none"> • Still learning about e-commerce transactions and markets (80%).
2. Organizational	<ul style="list-style-type: none"> • Constrained by financial/human resources (51%). 	<ul style="list-style-type: none"> • Constrained by financial/human resources (74%).
3. Technological	<ul style="list-style-type: none"> • Insufficient security to prevent hacking and malware (42%). 	<ul style="list-style-type: none"> • Technological infrastructure (including Website) of firm does not support e-commerce activities (62%).
4. Environmental	<ul style="list-style-type: none"> • Government incentives are not sufficient (46%). 	<ul style="list-style-type: none"> • Lack of standards/regulations from government on e-commerce activities (56%). • The additional costs of e-payment (e.g. commissions, bank charges, etc.) and logistics are high (56%).

Notes: Figures in parentheses show the percentage of somewhat agree and strongly agree to total responses on the respective item. This table summarizes the results shown in Figures A1 to A4 in the Appendix.

Source: Survey results.

to online payment and transactions. The latter group attributed the key barrier to insufficient technological infrastructure. This is expected as many adopters are equipped with the technologies that support their e-commerce activities. Finally, the main environmental barrier for adopters is the lack of governmental incentives. Of the 109 adopters, only 20 received grants or incentives for using e-commerce (based on Table 6). Non-adopters consider the lack of standards/regulations from the government as the key environmental impediment to e-commerce activities. An equal percentage also consider the additional costs of e-payment (e.g., commissions, bank charges, etc.) and logistics as barriers towards adopting e-commerce.

Analysis by Size of Firms

The study also analyses the barriers to e-commerce adoption by the size of the enterprise, as the challenges faced by micro enterprises may differ from small enterprises due to differences in the scale of operation. Table 9 examines the four factors that may impede the adoption of e-commerce based on two different sizes of enterprises, namely, micro and small. We omit the medium as there are only a small number of medium enterprises among the respondents. The key item in each of the four main factors²⁴ are summarized in Table 10, while the details are shown in Tables A1 to A4 in the Appendix.

- **Micro Enterprises**

The CEO/Owner/Manager plays the most important role in influencing e-commerce adoption for micro enterprises (Table 9). This is because the CEO/owner is usually the sole decision-maker in micro enterprises. They may not be ready to take on the risks in this new channel of conducting

²⁴ To rank by importance, we add together the responses of “somewhat agree” and “strongly agree” and choose the item based on the highest added number. However, if there are two or more items with a similar number of response, we choose the one with the highest “strongly agree” response.

Table 9: Barriers by Firm Size (% of Total Response for Each Factor)*

Firm size / Total respondents	Adopter			Non-Adopter	
	Micro (<5) n = 63	Small (6-75) n = 42	Micro (<5) n = 75	Small (6-75) n = 17	
<i>Barriers</i>					
• Technological factors	46.0	59.5	26.7	41.2	
• Organizational factors	52.4	40.5	57.3	64.7	
• Environmental factors	41.3	54.8	42.7	35.3	
• CEO/Owner/Senior Management views	60.3	45.2	73.3	58.8	
<i>Table Summary</i>					
Adopter	Rank by Importance				
	1	2	3	4	
• Micro enterprise	CEO/Owner	Organizational	Technological	Environmental	Environmental
• Small enterprise	Technological	Environmental	CEO/Owner	Organizational	
Non-Adopter					
• Micro enterprise	CEO/Owner	Organizational	Environmental	Technological	Technological
• Small enterprise	Organizational	CEO/Owner	Technological	Environmental	Environmental

Note: * Reported values are based on somewhat important and most important responses from the respondents.
Source: Survey results.

Table 10: Key Barriers to E-commerce Adoption by Firm Size

Firm size	Adopter		Non-adopter	
	Micro (<5)	Small (6-75)	Micro (<5)	Small (6-75)
Key Barriers	Items			
CEO/Owner/ Senior Management views	Still learning about e-commerce transactions and markets (70%)	Still learning about e-commerce transactions and markets (67%)	Concern about managing e-commerce disruptive technologies (47%)	Still learning about e-commerce transactions and markets (47%). Concern about managing e-commerce disruptive technologies (47%)
Organizational factors	Constrained by financial/human resources to invest in e-commerce activities (54%)	Constrained by financial/human resources to invest in e-commerce activities (45%)	Constrained by financial/human resources to invest in e-commerce activities (81%)	Lack of technical knowledge / awareness of available training for e-commerce adoption (53%)
Technological factors	E-commerce activities (e.g., marketing, payment, logistics) are still segmented (37%)	Insufficient security to prevent hacking and malware (50%)	Technological infrastructure (including website) of firm does not support e-commerce activities (65%)	Technological infrastructure (including website) of firm does not support e-commerce activities (47%)
Environmental factors	Government incentives are not sufficient (51%)	Insufficient qualified vendors for developing and maintaining websites (41%)	Lack of standards/ regulations from government on e-commerce activities (60%)	Large segment of consumers that are still not literate in using e-commerce (58%)

Note: Figures in parentheses show the percentage of somewhat agree and strongly agree to total respondents on the item.
Source: Survey results.

business as they are still learning about e-commerce transactions and markets (Table 9). Hence, organizational factors are the second most important limitation for adopters that are micro enterprises. While the owners may be aware that the new technologies will disrupt their business, they are not sure whether adopting e-commerce will solve that problem. One possible reason is because they are constrained by financial/human resources to invest in e-commerce activities (Table 10). Technological barriers are deemed to be less important by micro enterprises as their business operation may not require sophisticated systems or technological infrastructures. They do however, find that e-commerce activities (e.g., marketing, payment, logistics) are still segmented. Finally, while environmental factors are considered the least important, more than 50 per cent (overall) agree that government incentives are not sufficient.

Non-adopters also deem the CEO/Owners/Manager and organizational factors as important barriers to e-commerce adoption. The owners consider the management of e-commerce disruptive technologies as the most important barrier to adoption (Table 10). Apart from the leaders' perceptions, these micro enterprises also face organizational barriers with more than 80 per cent responding that they are constrained by financial/human resources to invest in e-commerce activities. Contrary to the adopters, non-adopters consider environmental factors to be less of a barrier while technological factors are deemed the least important barrier. Non-adopters perceive the lack of standards/regulations from the government as the most important environmental barrier. As for technological barriers, the technological infrastructure (including website) of these non-adopting firms hinder their adoption of e-commerce activities.

- **Small Enterprises**

Small enterprises consist of 6 to 75 employees. Owners who are adopters may have already understood the importance of e-commerce for enhancing their market competitiveness and they have therefore embraced the digital revolution. Hence, the CEO/Owner/Senior Manager and organizational factors are deemed less important barriers to the use

of e-commerce (Table 9). Barriers which are deemed most important and somewhat important for small adopter enterprises, are technological and environmental factors (Table 9). For adopters, the main technological concern is security, especially with regards to hacking and malware (Table 10). On environmental factors, while adopting e-commerce may not be an issue, sustaining the usage may be challenging as there are insufficient qualified vendors for developing and maintaining websites (Table 10). It should be noted that the key limitation for CEOs lies in the fact that they are still learning about e-commerce transactions and markets (67 per cent). More than 45 per cent (overall) agree that limited financial/human resources is the key organizational barrier.

Non-adopters have the converse perception compared to adopters, meaning that their main barrier is the organizational factor, followed by CEO/Owner/Senior Manager's views while their less important barriers are technological and environmental barriers (Table 9). The change in the order of importance implies the following: While they may want to use e-commerce, many perceive that a large segment of consumers are still not literate in using e-commerce (58 per cent) and many are unaware of the available training for e-commerce adoption (53 per cent) (Table 10). Even if they are aware of the importance of e-commerce, the decision to adopt e-commerce depends on the CEO/Owner/Senior Manager's understanding of e-commerce transactions and markets. Over 47 per cent agree that they are still learning and have uncertainty over e-commerce benefits compared to costs and they are also concerned about managing e-commerce disruptive technologies. The lack of the leader's interest in adopting e-commerce can also lead to inadequate technological infrastructure to support e-commerce activities in their respective organizations.

- By Incentives/Grants Receivers

While conducting the research, we raised a question: *“What if the SMEs received help in the form of incentives or grants. Will their challenges be any different?”*. Table 11 shows that incentives/grant receivers place a greater importance on technological and environmental barriers. Counting most and somewhat important responses together will place

Table 11: Barriers Perceived by Firms That Received Grants for Using E-commerce

	<i>% of total response by grant recipients (n = 20)</i>
Rank for technological factors	55
Rank for organizational factors	40
Rank for environmental factors	55
Rank for CEO/Owner/Senior Management views	50

Source: Survey results.

the CEO/Owner/Manager’s views as being of lesser importance than technological and environmental factors.

Grant recipients perceive that challenges pertaining to security issues such as hacking and malware are the most important barriers. Grants which are given may only be used for setting up basic physical infrastructure which may only take into account basic security features. Even so, some noted that their technological infrastructure (including website) is still insufficient to support e-commerce activities (Table 12). Analysing the environmental factors, grant recipients also face challenges from additional e-payments (e.g., commissions, bank charges, etc.) and high logistics costs. Buyers may also not be e-commerce literate, hence creating a challenging business environment for them, even after adopting e-commerce. These grants also may not be sufficient as indicated in organizational factors whereby 40 per cent of grant recipients are still constrained by financial/human resources in their participation of e-commerce activities. To address issues of competition, CEO/Owner/Senior managers must equip themselves with more knowledge on e-commerce transactions and markets as 65 per cent indicate that they are still in the learning phase.

BENEFITS OF E-COMMERCE

This section will examine the benefits of e-commerce by the responses of e-commerce users (adopters) and non-e-commerce users (non-adopters).

Table 12: Main Barriers Faced by Grant Recipients

<i>Technological factors</i>		
Insufficient security to prevent hacking and malware	Strongly Agree	25
	Somewhat agree	20
	Overall agree	45
	Neither disagree nor agree	35
<i>Organizational factors</i>		
Constrained by financial/human resources to invest in e-commerce activities	Strongly Agree	10
	Somewhat agree	30
	Overall agree	40
	Neither disagree nor agree	25
<i>Environmental factors</i>		
The additional costs of e-payment (e.g., commissions, bank charges, etc.) and logistics are high.	Strongly Agree	10
	Somewhat agree	30
	Overall agree	40
	Neither disagree nor agree	25
<i>CEO/Owners/Management views</i>		
Still learning about e-commerce transactions and markets	Strongly Agree	25
	Somewhat agree	40
	Overall agree	65
	Neither disagree nor agree	30

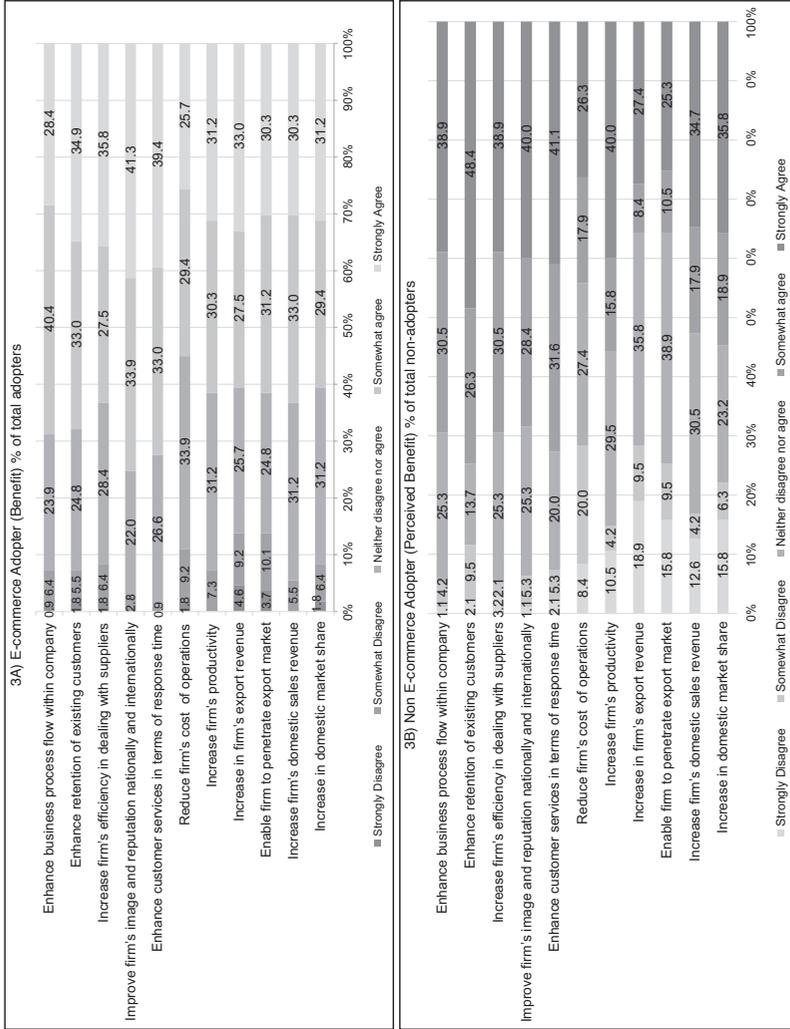
Note: Aggregating Strongly agree and somewhat agree responses.

Source: Survey results.

Since the latter has yet to use e-commerce, their responses are considered *perceived benefits*.

Based on Figure 3, non-adopters perceive that e-commerce will help them retain customers by enhancing customer services in terms of response time. E-commerce is deemed to improve a firm's productivity and the firm's image and reputation in domestic and international markets. Their perceived benefits are not farfetched as the top three benefits of e-commerce that are strongly agreed upon by adopters are: (i) improvement of firm's image and reputation nationally and

Figure 3: Benefits (Adopters) and Perceived Benefits (Non-adopters) of E-commerce



Source: Survey findings.

internationally, (ii) enhancement of customer service in terms of response time and, (iii) increase in firm's efficiency in dealing with suppliers. E-commerce has allowed businesses to extend their reach in domestic and international markets. In a way, it provides greater exposure for companies and functions as a tool for their branding and marketing activities.

E-commerce users are also able to improve the efficiency of their backward (suppliers) and forward business linkages (customers and retail). Extending the productivity benefits, many adopters "somewhat agree" that e-commerce also enhances the business process flow within their company. E-commerce also enhances the retention of existing customers and subsequently increase a firm's domestic sales revenue. The nexus between e-commerce adoption and exports seems weak (in comparison to other factors) as increasing a firm's domestic sales revenue and enabling firms to penetrate export market received the most "strongly disagree" and "somewhat disagree" responses by adopters.

Benefits of E-commerce by Enterprise Size

- Micro Enterprises

Micro adopters and non-adopters have similar top five (perceived) benefits (see Table A5 in Appendix). For a micro enterprise, it is perceived that its reputation will be enhanced due to the exposure it will be getting. Adopters also perceive that e-commerce will enhance its customer service in terms of response time, and its dealings with suppliers. This means e-commerce increases a firm's efficiency in managing its value chain, thereby improving business process flows within the company and allowing it to retain existing customers.

To summarize, the top five benefits for adopters are:

1. Improve firm's image and reputation nationally and internationally
2. Enhance customer services in terms of response time
3. Increase firm's efficiency in dealing with suppliers
4. Enhance business process flow within company
5. Enhance retention of existing customers

Similarly, the top five benefits for non-adopters are:

1. Enhance retention of existing customers
2. Enhance customer services in terms of response time
3. Increase firm's efficiency in dealing with suppliers
4. Enhance business process flow within company
5. Improve firm's image and reputation nationally and internationally

- **Small Enterprises**

The top five benefits for small enterprises are also similar, regardless of e-commerce adoption status. They are also similar to micro enterprise except that the focus in small enterprises is on generating sales and the domestic market share. Non-adopters expect an increase in domestic market share while adopters experience an increase in firm's domestic sales revenue by using e-commerce.

Top five benefits for adopters are:

1. Enhance customer services in terms of response time
2. Improve firm's image and reputation nationally and internationally
3. Enhance retention of existing customers
4. Enhance business process flow within company
5. Increase firm's domestic sales revenue

Top five benefits for non-adopters are:

1. Enhance business process flow within company
2. Enhance customer services in terms of response time
3. Enhance retention of existing customers
4. Improve firm's image and reputation nationally and internationally
5. Increase in domestic market share

CONCLUSION

Comparing adopters with non-adopters, the findings of the survey indicate that both groups are similar in that they perceive the CEO or decision-maker as the most important of the four main factors, for adopting e-commerce.

Apart from this common factor, the relative importance of the other three main factors, namely, technological, organizational and environmental, differ between adopters and non-adopters, indicating that the same policies cannot be applied to the two groups. Instead, a differentiated policy response is needed to address the differences in the relative importance of each barrier in the two groups of respondents. For example, adopters assign relatively greater importance to technology as a barrier while non-adopters are more concerned about organizational barriers. For adopters, data protection policies should be in place and insufficient security to prevent hacking and malware is their main technological concern. Policies that encourage e-commerce adoption need to facilitate non-adopters in overcoming their financial/human constraints. In particular, policies that increase technical knowledge may assist them in solving human resource constraints while financial incentives may help them overcome their firm capacity/size issues.

There are also differences in response, based on firm size. For micro enterprises, the two most important perceived barriers are the CEO and organizational factors. The two least important perceived barriers are the technological and environmental factors, regardless of whether they are adopters or non-adopters. For small enterprises, the perceived relative importance of the four factors varies according to whether they are adopters or non-adopters.

The key findings indicate that Malaysia has to shift from one-size-fits-all strategies to a more nuanced policy response that addresses the differences in perceived barriers of adopters and non-adopters and which is also cognizant of the size of the firms.

In the case of grant recipients, since they have already received a grant and adopted e-commerce, they are more concerned about using e-commerce to generate revenues. They therefore put more weight on technological and environmental factors. Hence, grants need to be accompanied by appropriate policies that address technological and environmental barriers.

Finally, micro and small enterprises, regardless as of whether they are adopters or non-adopters, perceive the benefits to be in the domestic rather than the export market. Thus getting firms on board e-commerce does

not automatically lead to exports. Exporting via e-commerce requires complementary policies that focus on exporting issues such as the use of digital marketing to promote products on e-commerce platforms in the targeted export market.

APPENDIX: SURVEY RESULTS

Figure A1: Barriers to E-commerce Adoption: Issues within CEO/Owner/Senior Management Views (% of Total Response within Each Issue)

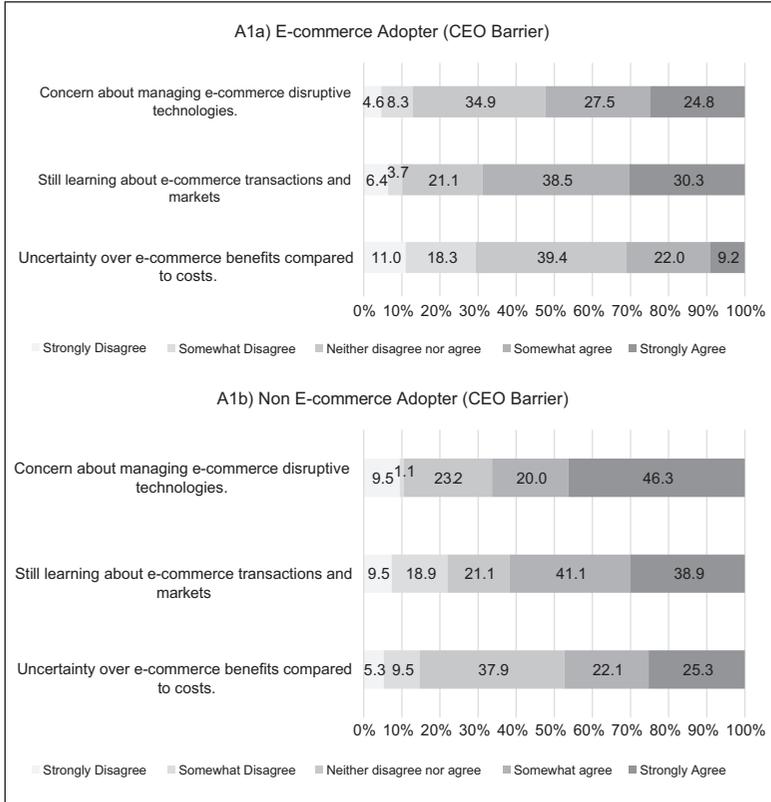


Figure A2: Barriers to E-commerce Adoption: Issues within Organizational Factors (% of Total Response within Each Issue)

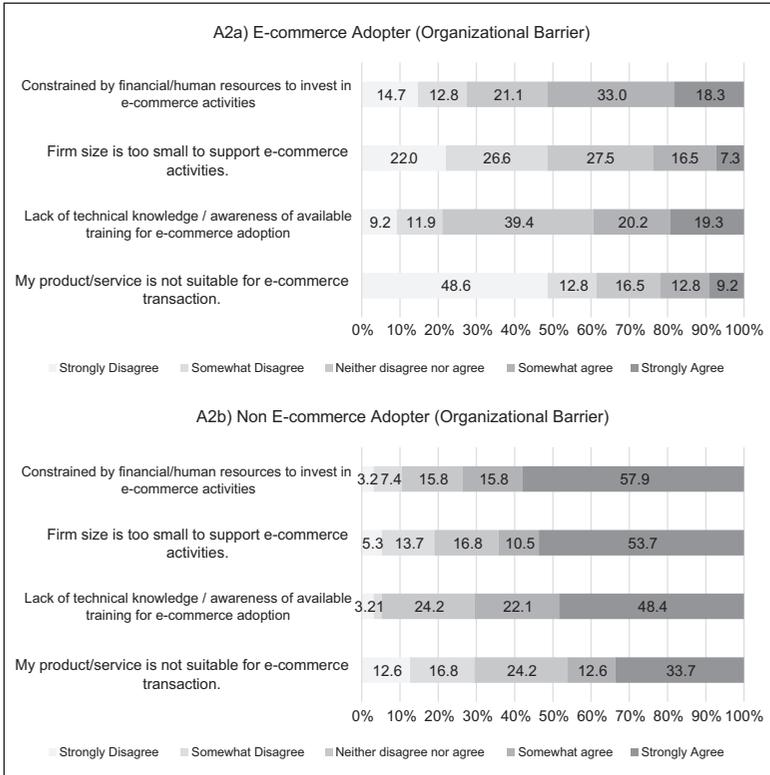


Figure A3: Barriers to E-commerce Adoption: Issues within Technological Factors (% of Total Response within Each Issue)

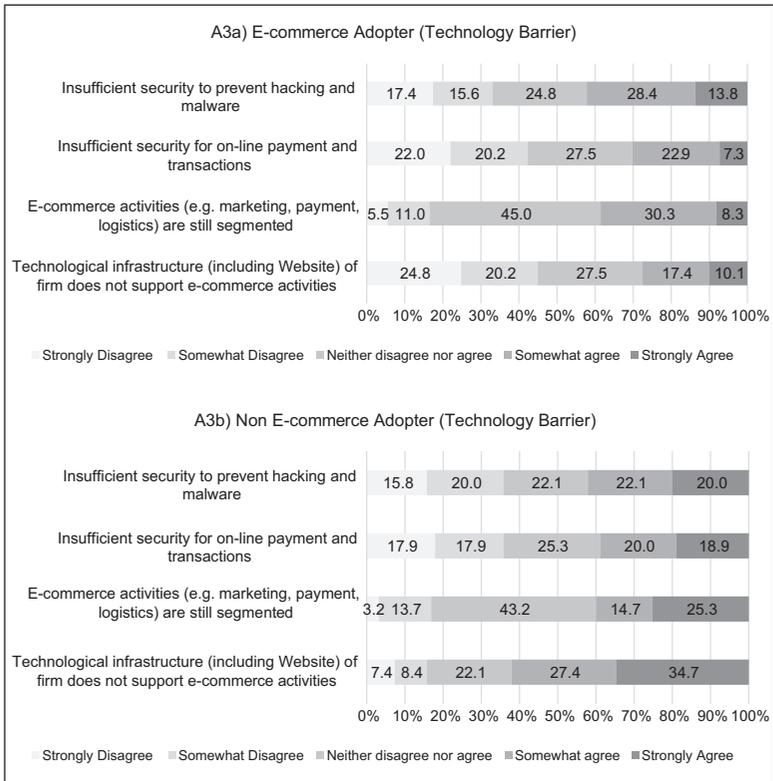
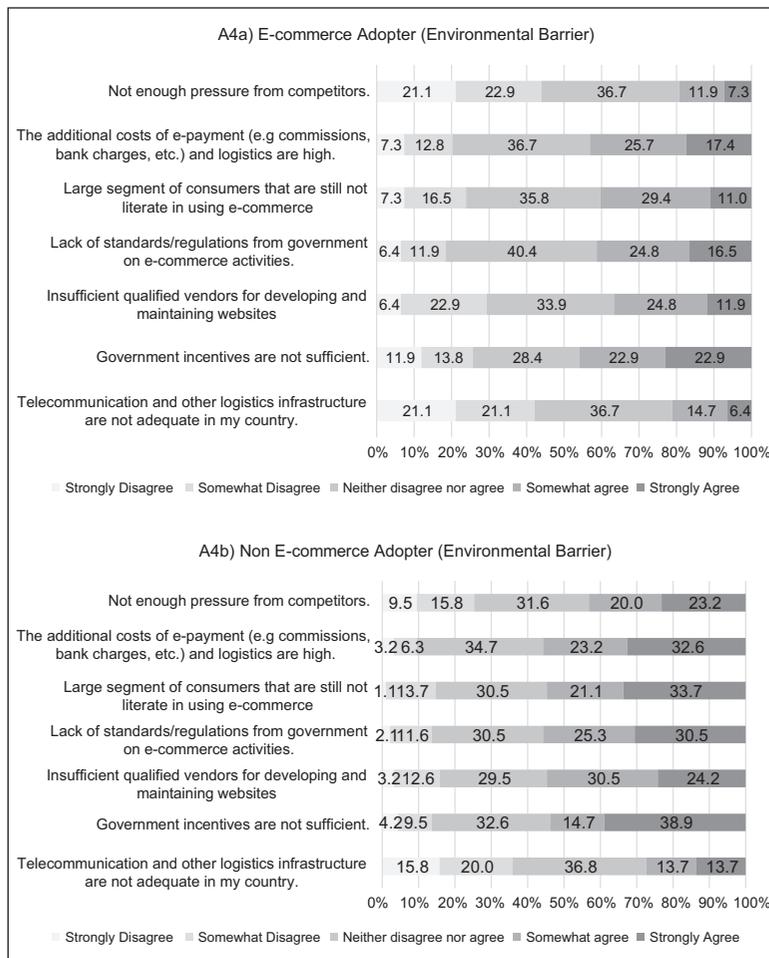


Figure A4: Barriers to E-commerce Adoption: Issues within Environmental Factors (% of Total Response within Each Issue)



**Table A1: Barriers to E-commerce Adoption by Firm Size: CEO/Owner/Senior Management Views
(% of Total Response within Each Issue)**

	Adopter		Non-adopter	
	SME Classification**			
	Micro <5	Small 6-75	Micro <5	Small 6-75
Uncertainty over e-commerce benefits compared to costs				
• Strongly agree	14.3	2.4	28.0	17.6
• Somewhat agree	15.9	26.2	20.0	29.4
• Overall agree*	30.2	28.6	48.0	47.1
• Neither disagree nor agree	34.9	50.0	38.7	29.4
Still learning about e-commerce transactions and markets				
• Strongly agree	34.9	26.2	45.3	29.4
• Somewhat agree	34.9	40.5	20.0	17.6
• Overall agree	69.8	66.7	65.3	47.1
• Neither disagree nor agree	15.9	28.6	14.7	35.3
Concern about managing e-commerce disruptive technologies.				
• Strongly agree	30.2	19.0	52.0	29.4
• Somewhat agree	20.6	33.3	17.3	17.6
• Overall agree	50.8	52.4	69.3	47.1
• Neither disagree nor agree	31.7	42.9	18.7	47.1

Notes: * Overall agree = Somewhat agree + Strongly agree

**Malaysia SME classification based on number of employees.

Source: Survey results.

**Table A2: Barriers to E-commerce Adoption by Firm Size: Organizational Factors
(% of Total Response within Each Issue)**

	Adopter		Non-adopter	
	SME Classification			
	Micro <5	Small 6-75	Micro <5	Small 6-75
My product/service is not suitable for e-commerce transaction.				
• Strongly agree	9.5	4.8	38.7	17.6
• Somewhat agree	12.7	14.3	12.0	11.8
• Overall agree	22.2	19.0	50.7	29.4
• Neither disagree nor agree	11.1	26.2	24.0	17.6
Lack of technical knowledge / awareness of available training for e-commerce adoption				
• Strongly agree	20.6	16.7	53.3	35.3
• Somewhat agree	17.5	23.8	21.3	17.6
• Overall agree	38.1	40.5	74.7	52.9
• Neither disagree nor agree	33.3	47.6	18.7	47.1
Firm size is too small to support e-commerce activities.				
• Strongly agree	9.5	4.8	62.7	23.5
• Somewhat agree	17.5	11.9	9.3	17.6
• Overall agree	27.0	16.7	72.0	41.2
• Neither disagree nor agree	19.0	42.9	14.7	11.8
Constrained by financial/human resources to invest in e-commerce activities				
• Strongly agree	23.8	11.9	64.0	35.3
• Somewhat agree	30.2	33.3	17.3	5.9
• Overall agree	54.0	45.2	81.3	41.2
• Neither disagree nor agree	12.7	35.7	8.0	47.1

Notes: * Overall agree = Somewhat agree + Strongly agree
 **Malaysia SME classification based on number of employees.
 Source: Survey results.

**Table A3: Barriers to E-commerce Adoption by Firm Size: Technological Factors
(% of Total Response within Each Issue)**

	Adopter		Non-adopter	
	SME Classification			
	Micro <5	Small 6-75	Micro <5	Small 6-75
Technological infrastructure (including website)				
of firm does not support e-commerce activities				
• Strongly agree	4.8	16.7	41.3	5.9
• Somewhat agree	15.9	16.7	24.0	41.2
• Overall agree	20.6	33.3	65.3	47.1
• Neither disagree nor agree	28.6	28.6	20.0	29.4
E-commerce activities (e.g., marketing, payment, logistics)				
are still segmented				
• Strongly agree	7.9	7.1	28.0	17.6
• Somewhat agree	28.6	28.6	14.7	11.8
• Overall agree	36.5	35.7	42.7	29.4
• Neither disagree nor agree	46.0	47.6	41.3	47.1
Insufficient security for on-line payment and transactions				
• Strongly agree	6.3	9.5	21.3	11.8
• Somewhat agree	17.5	26.2	22.7	5.9
• Overall agree	23.8	35.7	44.0	17.6
• Neither disagree nor agree	28.6	28.6	25.3	23.5
Insufficient security to prevent hacking and malware				
• Strongly agree	14.3	11.9	22.7	11.8
• Somewhat agree	20.6	38.1	20.0	23.5
• Overall agree	34.9	50.0	42.7	35.3
• Neither disagree nor agree	28.6	21.4	21.3	23.5

Notes: * Overall agree = Somewhat agree + Strongly agree

**Malaysia SME classification based on number of employees.

Source: Survey results.

Table A4: Barriers to E-commerce Adoption by Firm Size: Environmental Factors
(% of Total Response within Each Issue)

	Adopter		Non-adopter	
	SME Classification			
	Micro <5	Small 6-75	Micro <5	Small 6-75
Telecommunication and other logistics infrastructure are not adequate in my country				
• Strongly agree	7.9	4.8	17.3	0.0
• Somewhat agree	14.3	11.9	13.3	11.8
• Overall agree	22.2	16.7	30.7	11.8
• Neither disagree nor agree	33.3	42.9	36.0	41.2
Government incentives are not sufficient.				
• Strongly agree	31.7	9.5	42.7	29.4
• Somewhat agree	19.0	26.2	12.0	17.6
• Overall agree	50.8	35.7	54.7	47.1
• Neither disagree nor agree	25.4	35.7	32.0	41.2
Insufficient qualified vendors for developing and maintaining websites				
• Strongly agree	12.7	9.5	29.3	5.9
• Somewhat agree	17.5	31.0	30.7	29.4
• Overall agree	30.2	40.5	60.0	35.3
• Neither disagree nor agree	34.9	35.7	26.7	41.2

Lack of standards/regulations from government on e-commerce activities.

• Strongly agree	20.6	11.9	34.7	17.6
• Somewhat agree	25.4	19.0	25.3	23.5
• Overall agree	46.0	31.0	60.0	41.2
• Neither disagree nor agree	33.3	52.4	26.7	47.1

Large segment of consumers who are still not literate in using e-commerce

• Strongly agree	12.7	9.5	37.3	23.5
• Somewhat agree	23.8	35.7	17.3	35.3
• Overall agree	36.5	45.2	54.7	58.8
• Neither disagree nor agree	31.7	40.5	32.0	17.6

The additional costs of e-payment (e.g., commissions, bank charges, etc.) and logistics are high

• Strongly agree	19.0	14.3	32.0	35.3
• Somewhat agree	27.0	23.8	24.0	17.6
• Overall agree	46.0	38.1	56.0	52.9
• Neither disagree nor agree	33.3	42.9	36.0	35.3

Not enough pressure from competitors.

• Strongly agree	9.5	4.8	26.7	11.8
• Somewhat agree	7.9	16.7	17.3	17.6
• Overall agree	17.5	21.4	44.0	29.4
• Neither disagree nor agree	31.7	45.2	28.0	52.9

Notes: * Overall agree = Somewhat agree + Strongly agree

**Malaysia SME classification based on number of employees.

Source: Survey results.

Table A5: Benefits of E-commerce by Size of Firms (% of Total Response)

	E-commerce Adopter		Non E-commerce Adopter	
	SME Classification			
	Micro <5	Small 6-75	Micro <5	Small 6-75
Increase in domestic market share	63.5	59.5	54.7	58.8
Increase firm's domestic sales revenue	66.7	61.9	53.3	52.9
Enable firm to penetrate export market	68.3	57.1	37.3	29.4
Increase in firm's export revenue	61.9	61.9	37.3	29.4
Increase firm's productivity	61.9	61.9	54.7	58.8
Reduce firm's cost of operations	57.1	54.8	46.7	29.4
Enhance customer services in terms of response time	76.2	69.0	74.7	64.7
Improve firm's image and reputation nationally and internationally	79.4	69.0	70.7	64.7
Increase firm's efficiency in dealing with suppliers	71.4	54.8	73.3	58.8
Enhance retention of existing customers	69.8	66.7	77.3	64.7
Enhance business process flow within company	71.4	66.7	72.0	64.7

Source: Survey findings.

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