

ASEAN SMPs

A Report on
Technological Competency Skills

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Research Highlights

“Due to technology advancement, Small and Medium Practitioners (SMPs) are required to evolve and offer a broader range of services to their clients who are mainly Small and Medium Enterprises (SMEs).”



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ABBREVIATIONS

ACCA	Association of Chartered Certified Accountants
ACRA	Accounting and Corporate Regulatory Authority (Singapore)
AFA	ASEAN Federation of Accountants
ASEAN	Association of Southeast Asian Nations
ATLAS	Audit Tool and Linked Archives (Indonesia)
CAATs	Computer-aided Audit Tools
CCH	Commerce Clearing House
CCM	Companies Commission of Malaysia
CIMA	Chartered Institute of Management Accountants
CISA	Certified Information System Auditor
CISSP	Certified Information System Security Professional
CPA	Certified Public Accountant
DSAK	Dewan Standar Akuntasi Keuangan
DSPAP	Dewan Standar Profesional Akuntan Publik
ERP	Enterprise Resource Planning
ESG	Enterprise Singapore
GDP	Gross Domestic Product
GST	Goods and Service Tax
IAASB	International Auditing and Assurance Standards Board
IAI	Institute of Indonesia Chartered Accountants
IAMI	Indonesian Institute of Management Accountants
IAPI	Indonesian Institute of Certified Public Accountants
IASB	International Accounting Standards Board
ICAEW	Institute of Chartered Accountants in England and Wales
IFAC	International Federation of Accountants
IoT	Internet of Things
IPSASB	International Public Sector Accounting Standards Board
IR 4.0	Industrial Revolution 4.0
ISCA	Institute of Singapore Chartered Accountants
ISO	International Organisation for Standardisation
IT	Information Technology
KICPAA	Kampuchea Institute of Certified Public Accountants and Auditors
MASB	Malaysian Accounting Standards Board
MIA	Malaysian Institute of Accountants
MICPA	The Malaysian Institute of Certified Public Accountants
MME	Ministry of Mines and Energy (Cambodia)
MITI	Ministry of International Trade and Industry (Malaysia)
MoF	Ministry of Finance
MSMEs	Micro, Small, and Medium Enterprises
MTI	Ministry of Trade and Industry (Singapore)
NAC	National Accounting Council (Cambodia)
NGO	Non-Governmental Organisation

ABBREVIATIONS

NSDC	National SME Development Council
OECD	Organisation for Economic Co-operation and Development
OSMEP	Office SME of Promotion (Thailand)
PAOC	Public Accountants Oversight Committee (Singapore)
R&D	Research and Development
SAC	Singapore Accountancy Commission
SEC	The Security and Exchange Commission (Thailand)
SME	Small and Medium Enterprises
SMP	Small and Medium Practices
TFAC	Thailand Federation of Accounting Professions
TFeP	Technology Capability, Firm Innovativeness and E-Business Practices
UMKM	Usaha Mikro Kecil dan Menengah (Indonesia)
XBRL	Extensible Business Reporting Language

DISCLAIMER INFORMATION FOR READER

In this research, all SMPs are part of SME under the category of 'services' which fundamentally refers to all business services including distributive trade; hotels and restaurants; accounting professional and ICT services; private education and health; entertainment; financial inter-mediation; and manufacturing-related services such as research and development (R&D), logistics, warehouse and engineering and etc. depending on the individual country's definition.

AFA Research Report (2018) identified significant issues on inconsistent and arbitrary definitions of SMEs within and between countries, across regulatory bodies, government departments and professional institutions. Differences in existing laws, rules and jurisdiction within and between countries contribute to difficulties in sharing a common regional definition.

Different countries have individual characteristics of SMEs such as employment-based, asset-based, and revenue-based. It is fair to conclude that, any of these three features can be used to define SMPs in the ASEAN region. This research recognised employment-based as a common definition for SMPs as this feature is available among the five selected countries.

The overall samples for this research cover only five (5) countries which are Cambodia, Indonesia, Malaysia, Singapore and Thailand. Results presented in this report are mainly from descriptive analysis and qualitative findings using interview technique to confirm the research objectives. This research was conducted between November 2019 until June 2020, and the data collection phase was done from November 2019 until February 2020.

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EXECUTIVE SUMMARY

Due to technology advancement, Small and Medium Practitioners (SMPs) are required to evolve and offer a broader range of services to their clients who are mainly Small and Medium Enterprises (SMEs).

This report will describe the definition, framework, current level of competency, and challenges faced by ASEAN SMPs in improving their technological competency skills in five respective countries namely Cambodia, Indonesia, Malaysia, Singapore and Thailand. Desktop research, literature review, surveys and interviews were conducted to collect data for this research.

Definition & Technology Adoption Landscape

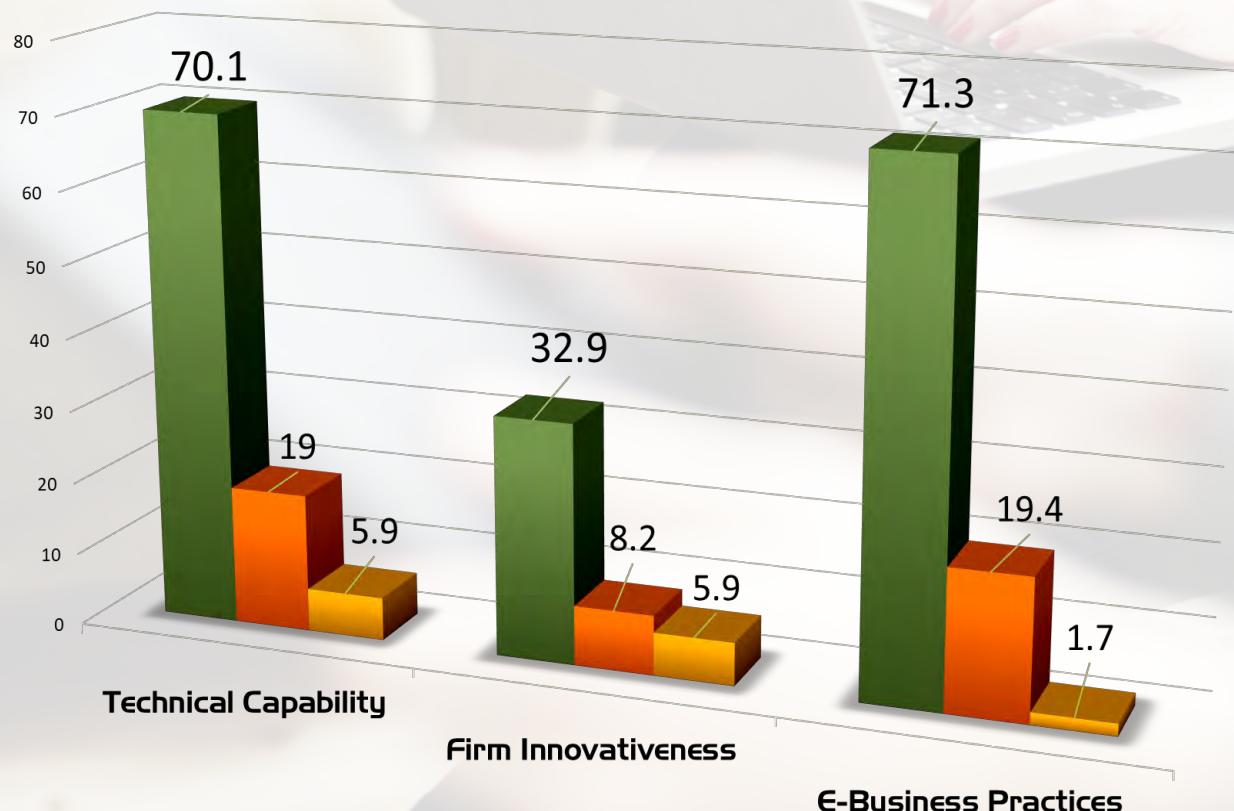
- Overall, SMEs contribution to the economy is undoubtedly massive – they employ more than 52% of the total workforce, contribute between 10% - 30% of ASEAN export volume and produce more than 30% of the ASEAN GDP (SME Development ASEAN 2018).
- International Federation of Accountants (IFAC) state that definitions of SMPs vary from one jurisdiction to another depending on the country's regulations and governance, and there is no common definition of ASEAN SMPs provided in the literature and reports by professional bodies for research investigation purposes. After a thorough investigation, it is proposed that the definition of ASEAN SMPs to be referred based on employment-based criteria as it was found that all selected ASEAN countries use these similar criteria to define their SMPs (other features include assets-based and revenue-based definitions). This common reference may be useful for future researchers from the academia and the industry in conducting their research on ASEAN SMPs in various fields.
- Although a majority of the SMPs do not have the resources to adopt the latest technology, they are savvy enough to use various free IT tools and platforms to facilitate their daily operations.
- Due to lack of expertise, a majority of SMPs do not provide advanced IT services (including integration system services or IT advisory services) to their clients.
- SMPs view technology development and implementation as a significant challenge due to high investment costs and insufficient knowledge and skills of their employees. This issue may deter them from becoming more innovative and sustainable in the current global market place. However, the SMPs are ready to shift their way of working to follow the latest trends and demand.

Summary of SMPs by Countries

Features		Summary of SMPs by Countries				
		Singapore	Malaysia	Indonesia	Thailand	Cambodia
<i>Total Number of SMPs</i>		708	1,473	450	4,756	53
<i>Characteristics of SMPs</i>	<i>Employment-based</i>	Local shareholdings with at least 30%: not exceeding 200 employees	Small: 5 to 29 Medium: 30 to 75	Small: 5 to 19 Medium: 20 to 99	Small: <30 Medium: 30 to 100	Small: <50 Medium: <100
	<i>Assets-based</i>	Not used in Singapore	Not used in Malaysia	Small: IDR500 million (USD34,106) Medium: IDR10 billion (USD682,083)	Small: <THB50 million (USD1,600,254) Medium: THB50 million (USD1,600,254) to THB300 million (USD9,601,529)	Small: USD50,000 to USD0.25 million Medium: USD0.25 million to USD0.5 million
	<i>Revenue-based</i>	Local shareholdings with at least 30%: not more than SGD100 million (USD73,761,820)	Small: RM0.3 million (USD72,184) to less than RM3 million (USD721,841) Medium: RM3 million (USD721,841) to RM20 million (USD4,812,544)	Small: IDR2.5 billion (USD170,532) Medium: IDR50 billion (USD3,410,651)	Not used in Thailand	Not used in Cambodia

Current Level of Technological Competency Skills

- In general, SMPs covered by this report possess only basic level of technological competency skills due to their focus on sustaining rather than improving their services and offerings. This issue will undoubtedly limit the types and quality of services rendered by the SMPs.



Basic



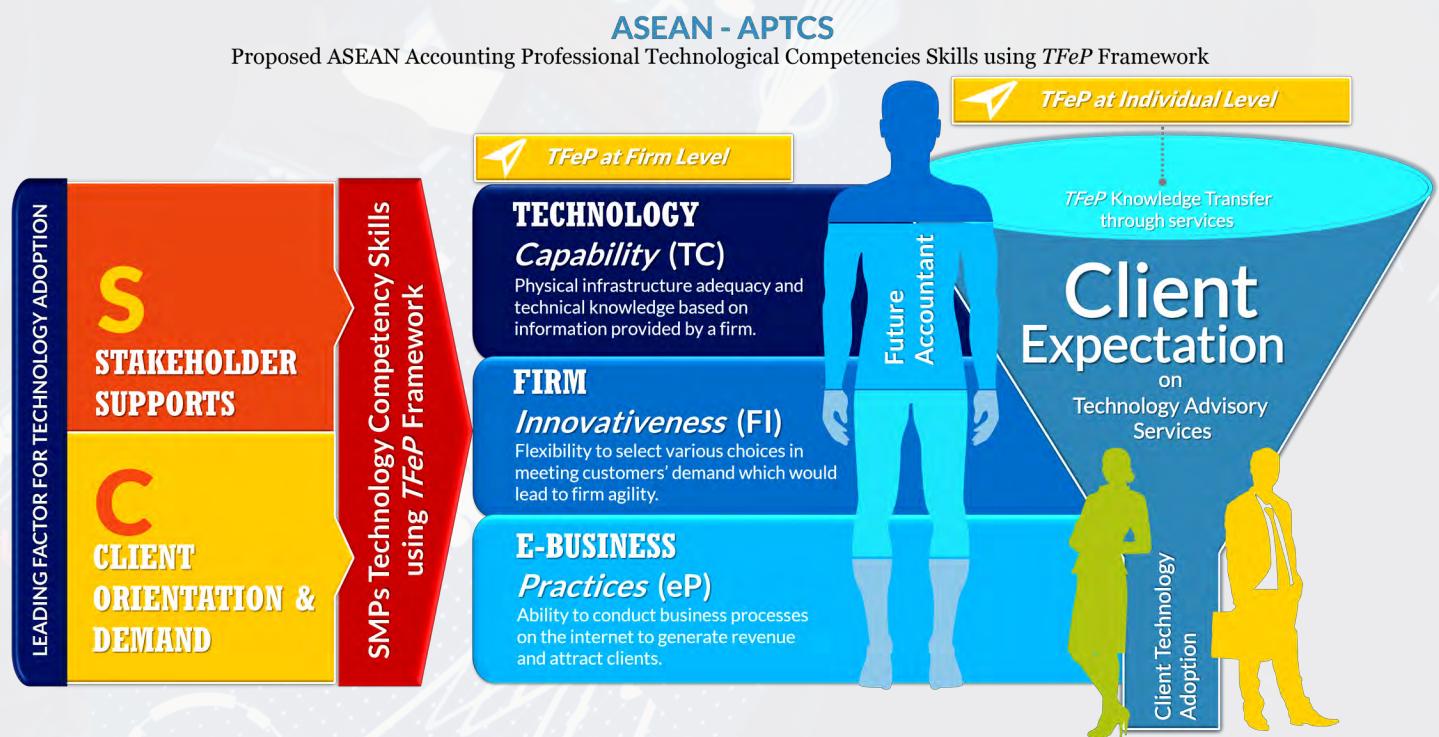
Intermediate



Advanced

Graph above refer to the Technology Competency Skills among ASEAN SMPs in %

Proposed TFeP Framework for ASEAN SMPs



- Taking into consideration the findings from this research, a new framework that depicts the ASEAN SMPs' technological competency skills in providing their services to the clients is proposed. The framework portrays that the ASEAN SMPs' technological competency skills can be explained and measured using three themes namely technical capability, firm innovativeness and e-business practices. Upon further investigation, it was found that there are two main determinants for ASEAN SMPs technological competency skills namely client orientation and assistance and support from stakeholders.
- In order to execute the proposed TFeP framework, the SMPs need to adopt new technology via continued stakeholders' supports and improved clients' demands. The implementation of this framework is instigated by improving the firm's capability in technology adoption, providing innovative technology advisory services, and practising technology within their business operations. Consequently, it will empower the SMPs' competencies at firm level and improve current competencies of their accountants which in turn will result in the readiness of the SMPs in fulfilling their roles to provide services for their SME clients.

Proposed TFeP Framework for ASEAN SMPs

- The TFeP framework is useful to validate technology competency skills from both firm and individual levels. The framework illustrates how both stakeholder supports and client orientation and demand can influence technology capability, firm innovativeness and e-business practices of a firm. Implementation of TFeP at firm level will indirectly influence future technological competency skills at individual level. It is important for a firm to identify their employees' current competency level for them to provide the necessary training programs to improve the individual worker's technology competencies to cater for current and future clients' expectations. Furthermore, this TFeP framework is suitable as a means to:

1

Assist SMPs to chart their technology adoption journey by prioritising relevant technology to invest into.

2

Develop a recruitment framework that is able to identify the right staff with the required technology competency. If SMPs do not have such framework, they will end up hiring incompetent and unsuitable workers.

3

Extend the proposed TFeP framework's self-assessment checklist system that can assist SMPs to determine their firms' technological competency skills.



PART 1 INTRODUCTION



Internationally, Small and Medium Enterprises (SMEs) have been recognised as vital contributors not only to the overall world economic development, but also to the developing countries in the ASEAN region. How do Small and Medium Practitioners (SMPs) fit into this picture?

SMPs play an important role in supporting SMEs via providing business consultancy and related services, especially in terms of compliance to accounting, taxation and other regulatory requirements, emergency advice, business advice, statutory advice and financial management support to improve performance (Husin & Ibrahim, 2014).

Definition of SMPs

IFAC has a unified view to describe SMPs as:

"accounting practitioners whose clients are mostly SMEs, external sources are used to supplement limited in-house technical resources, and contain a limited number of professional staff".

A study by Bunting (2008) found that SMPs demonstrate one or more of the characteristics which are related to audit practices such as:

Clients: Most of their clients are SMEs,

Job Scope: They do not usually audit the accounts of listed entities,

Services: Majority of their clients' works may be non-assurance services,

Staff: They employ limited number of professional staff, and

Quality Control: They have direct, hands-on quality control procedures (Bunting, 2008).

The SMPs are different from the Big 4 and second or mid-tier accounting firms in terms of:

Characteristics: Having small number of staff,

Services: Provide non-assurance services such as tax advisory and regulatory compliance, and

Clients: Majority of SMPs clients are SMEs (Blackburn & Jarvis, 2010).

Although there are various definitions and meanings of SMPs, one thing for sure is that they play a significant role in the accounting field and are not merely a scale down version of larger accounting firms (Street, Albu, and Albu, 2016).

SMEs-SMPs Relationship

SMEs' perception of the SMPs impacts both the demand for advice as well as the SMEs-SMPs relationship. A majority of SMEs often fail in their business operations due to lack in marketing knowledge, planning, managerial skills and capabilities or competencies which require them to seek advices or business support (Kamyabi & Devi, 2011).

Although SMEs often expect SMPs to deliver good quality services, it is found that SMPs efficiency in providing such services depends on their personal and technical abilities (CIMA, 2015) which include:

Interaction with employees and managers,

Competitive forces,

Innovations and technology,

Regulatory requirements,

Other challenges faced by businesses (Hasan, 2017).

Effects of Technology to SMPs

Technological advancement has changed the accounting field forever. It is almost impossible nowadays to perform audit or financial operations without the use of technology. A study found that because the accountants are among the first professional groups that embraced the use of computer and software to facilitate their daily operation, they are now inseparable from using these gadgets in their daily work (Damasiotis, Trivellas, Santouridis, Nikolopoulos and Tsifora, 2015).

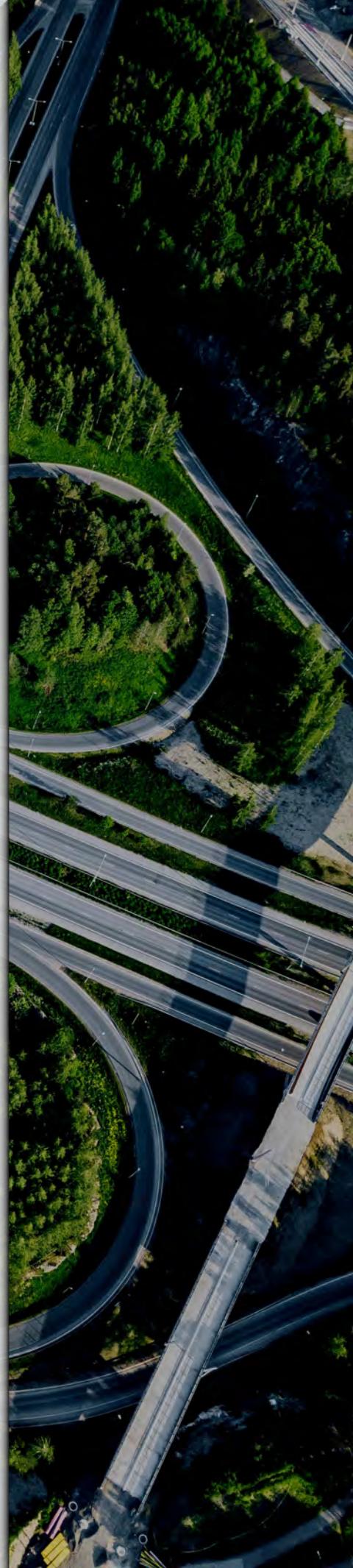
Among the advantages of adopting technology in any field including accountancy are:

1. Improved overall productivity, and
2. Minimum manpower requirement.

Due to this, it is becoming crucial for today's professionals to be well versed in the latest technological advancements. Organisations such as IFAC and other non-profit organisations strongly advocate its members to improve their competency in performing their tasks using the latest accounting software and technology.

SAC-ACCA Report (2020) mentioned that technology adoption creates business diversification through internationalisation and regionalisation for SMPs. Adding to this, the report mentioned that the SMPs that adopt new technology experience time and cost savings, better control and risk management as well as some revenue increment. In the current digital era, SMPs are forced to adapt to the disruptions and changes that will make them become relevant from clients' perspective especially in the age of Industry 4.0, IoT and blockchain.

It is important for both SMPs and SMEs to adopt the latest technology in order to be relevant in today's ecosystem. Undoubtedly, the demand for technology-based advisory services will continue to increase. Thus, SMPs need to redefine their roles from compliance based advisors to knowledge based advisors that are able to advise clients on data implications and recommend the best course of actions (Thompson, 2017).



Challenges Faced by SMPs in Adopting New Technology

Rapid technological development has brought a significant impact on businesses and consumers alike, and the Internet has connected billions of people all over the globe – drastically changing the way businesses and organisations operate.

Malaysian Institute of Accountants (2018) reported that the accounting profession is currently facing three major issues:

Rapid changes in digital technology,

Convergence of reporting standards globally as it creates standardised template and no flexibility in reporting, and

New forms of regulations.

Apart from that, among the barriers that hinder SMPs from utilising technology effectively are:

High costs,

Difficulty to find the right talents, and

Lack of understanding on future benefits (MIA, 2018).

It is evident that technological competency plays a significant role in firm innovation and competitiveness, and in order to enhance firm innovativeness, different business environment will require different set of technological competencies.

Aim of the Research

This research aims to review SMPs' technological competency skills in serving SMEs in five ASEAN countries namely Cambodia, Indonesia, Malaysia, Singapore and Thailand. Specifically, this research plans to examine the following areas:

SMPs Landscape

- a. What is the current technological development that may be beneficial to SMPs in ASEAN?
- b. What is the current level of technological adoption and usage by ASEAN SMPs?
- c. What are the current IT and advisory services provided by ASEAN SMPs?

SMPs Technological Competency

- a. What is the best means to determine ASEAN SMPs level of technological competency skills?
- b. What is the current ASEAN SMPs level of technological competency skills?

SMPs Technological Framework

- a. What are the technological competency skills possessed by ASEAN SMPs?
- b. What are the factors that influenced technological competency skills of ASEAN SMPs?
- c. What is the appropriate framework to assess ASEAN SMPs current technological competency skills?

This research will demonstrate the current level of technology competency skills among ASEAN SMPs based on a framework developed by Sulaiman et al. (2010). The framework illustrates technological competency skills in accordance with three themes namely technology capability, firm innovativeness and e-business practices.

Findings from this research will provide understanding on how to better assist SMPs to improve their service level and help them to achieve sustainability.

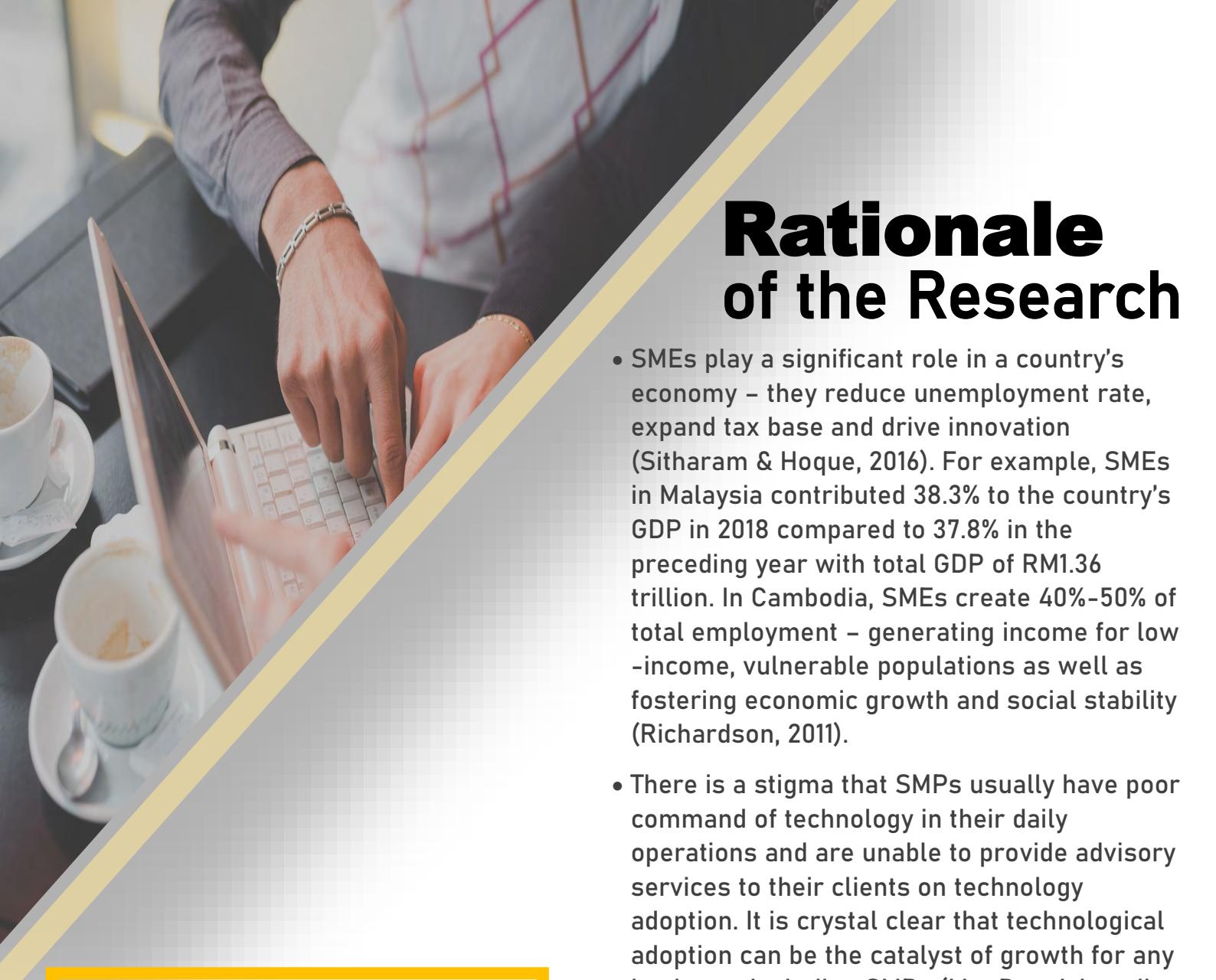
Findings from this study will provide understanding on how to better assist SMPs to improve their service level and help them to achieve sustainability.



Research Methodology

- **Interviews and Desktop Research:** Interviews were conducted in large companies while desktop research was performed to obtain relevant definitions and documents from the web.
- **Institutional Surveys:** This method aims to collect relevant documents and feedbacks from ASEAN Federation of Accountants (AFA) and related professional accounting bodies in the 5 countries studied.
- **Questionnaire:** Questionnaires were distributed to SMPs to understand the practitioners' technological adoption, type of clients, and services provided.
- **In-depth Interviews:** In-depth interviews were conducted with Professional Accountancy Organizations and SMPs to understand the practitioners' technological competency skills, clients' demands, and challenges faced.

**Specifics on methodologies employed in this research can be found in Appendix 2.*



Rationale of the Research

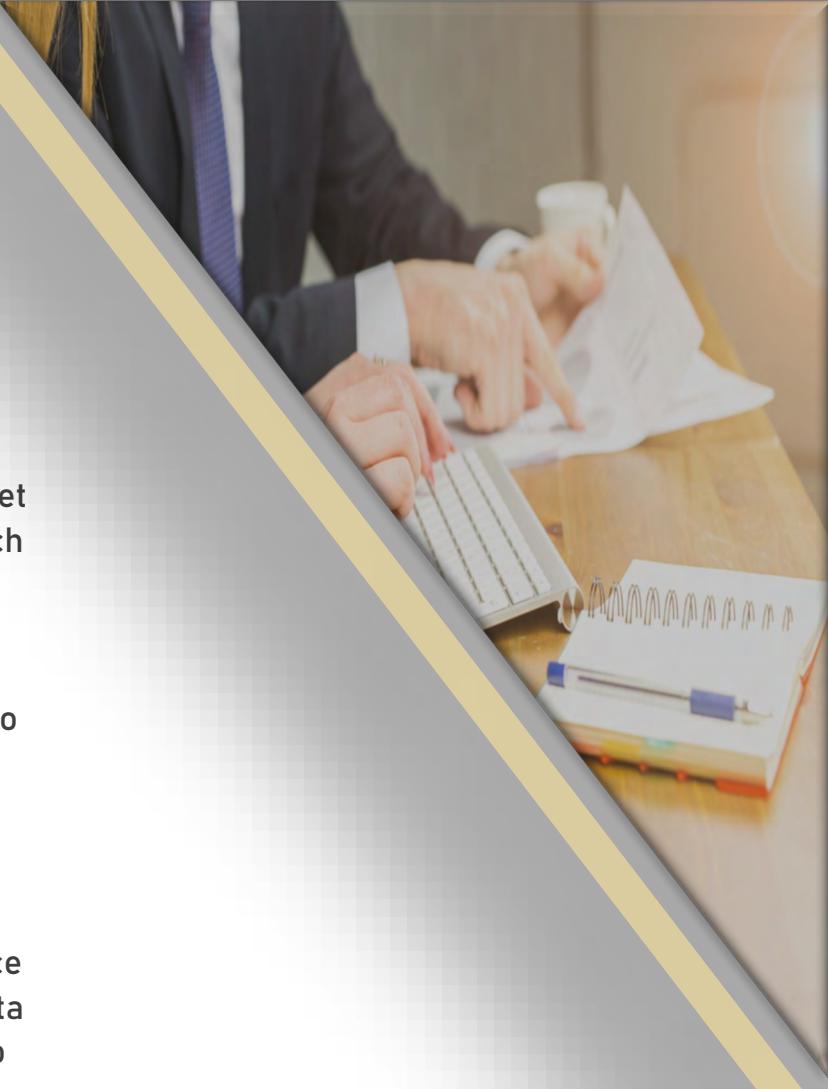
- SMEs play a significant role in a country's economy – they reduce unemployment rate, expand tax base and drive innovation (Sitharam & Hoque, 2016). For example, SMEs in Malaysia contributed 38.3% to the country's GDP in 2018 compared to 37.8% in the preceding year with total GDP of RM1.36 trillion. In Cambodia, SMEs create 40%-50% of total employment – generating income for low-income, vulnerable populations as well as fostering economic growth and social stability (Richardson, 2011).
- There is a stigma that SMPs usually have poor command of technology in their daily operations and are unable to provide advisory services to their clients on technology adoption. It is crystal clear that technological adoption can be the catalyst of growth for any business, including SMPs (Mat Dangi, Ismail, Johari, & Md. Noor, 2017). Thus, identifying SMPs' current technological capabilities and competencies are necessary to help them improve in the specific areas that they lack of.
- World Economic Forum (2018) warned that the demand for accounting-related jobs such as accounts clerk, book keeping and payroll clerk would decline due to global changes affected by technology.

“World Economic Forum (2018) warned that the demand for accounting-related jobs such as accounts clerk, book keeping and payroll clerk would decline due to global changes affected by technology.”

Rationale of the Research

- A report by McKinsey (2017) highlighted that the highest percentage job growth net of automation includes professionals such as accountants, who cannot be easily replaced by machines. The demand for future jobs related to professional accountants and auditors will grow due to the transformation of automation adoption. A new role will emerge in the accountancy field that is on accounting technology advisory.
- A study found that most SMPs in Asia face challenges relating to technology and data analytics (Richardt & Thompson, 2017). To remain relevant, there is a need for SMPs to distinguish themselves from their peers – the easiest way of doing this is by integrating technological best practices into their way of doing daily operations.
- The current business environment requires accounting professionals to be competent in information technology (IT) and have good understanding of computer applications (El-Dalahmeh, 2017). The extensive use of IT in the business has created the term “knowledge worker” – a person who is competent in the IT environment. SMPs having such employees will have advantage over their competitors will be able to offer better services and operate at the optimum efficiency (Ku Bahador & Haider, 2012).

"A report by the McKinsey (2017) highlighted that the highest percentage job growth net of automation includes professional such as accountants, who cannot be easily replaced by machine. "





Contributions of the Research

- To date, there is no single agreed definition for ASEAN SMPs. This research identified definitions of SMPs in the five countries and derived a common definition for ASEAN SMPs. This new definition can be used as a benchmark for future studies.
- The existing framework to assess accountants' technology competency skills is developed for the Malaysian context. Based on this framework, this research developed a new framework to determine ASEAN SMPs' technology competency skills.
- Using the developed framework, this research is able to determine the level of technological competency skills among ASEAN SMPs based on three factors namely technology capability, firm innovativeness and e-business practices. This is important as a benchmark for future reference.
- This research will provide greater understanding on the SMPs' technological competency skills in the countries involved as well as challenges faced by practitioners in adopting the latest technology. This result will help AFA and relevant accounting bodies in developing initiatives to assist SMPs in the region.



PART 2 OVERVIEW OF ASEAN SMPs

SMEs in Singapore have always contributed more than 50% to the total enterprise value addition in the economy, showing the increasingly important role of the country's SMEs. SMEs account for an estimated two-thirds of all employment and contribute just short of SGD200 billion to the economy (Teo, 2013). As of April 2019, there were an estimated 220,000 SMEs in Singapore, with the services sector constituting close to 80% of these enterprises (OECD/ERIA, 2018).

The main body responsible for elaborating SME policy in Singapore is the Enterprise Singapore (ESG), which is responsible for formulating, leading and coordinating all enterprise development strategies, including strategies for start-ups and SMEs.

Overview of ASEAN SMPs

The definition of SMPs vary from one jurisdiction to another. IFAC describes SMPs as practices that exhibit the following characteristics:

Their clients are mostly SMEs,

They use external sources to supplement limited in-house technical resources,

They employ a limited number of professional staff,

All ASEAN countries selected in this research do not have neither a specific or formal definition nor criteria for SMPs. SMPs themselves are SMEs and they do share the same characteristics as SMEs. SMPs serve all kinds of SMEs including small businesses, public sector organisations (e.g. small government agencies) and not for profit organisations that have limited resources and employ small number of human resources.

SMEs in Cambodia

“SMEs play an important role in the Cambodian economy as it contributes to both economic and social development. They contribute to 40%-50% of total employment, generating income for the low-income people and vulnerable populations as well as fostering economic growth and social stability. The SMEs are governed by the SME Sub Committee which was established by resolution No. 45 S.S.R dated August 28, 2007 and recomposed by a resolution No. 27 S.S.R dated November 14, 2008.”

The committee subsequently developed the SMEs development framework that provides definition of SMEs in Cambodia. The definition is provided based on the number of full-time employees. However, when the number of employees is not appropriate, the definition will then be based on the size of total assets (excluding land) or a combination of the two. There is no formal definition of SMEs in Cambodia in terms of financial standing due to different data requirements from financial institutions.

SMEs in Cambodia are classified into 3 categories namely, micro enterprises, small enterprises and medium enterprises as depicted in [Table 1](#).

Table 1: Definition of SMEs in Cambodia

Type	Employment-based	Assets-based (USD '000)
Micro	Less than 10 employees	Less than 50
Small	10 to Less than 50 employees	Between 50 to 250
Medium	51 to less than 100 employees	Between 250 to 500

Source: SME Development Policies in 4 ASEAN Countries-Cambodia

SMEs in Cambodia are divided into three sectors namely production, trading and service sectors. The service sector consists of companies that provide accounting, auditing, tax and legal services. Cambodian SMEs are mainly involved in the services sector (Hatsukano & Tanaka, 2014).

The accountants in this country are governed by two main accounting institutions namely the National Accounting Council (NAC) and the Kampuchea Institute of Certified Public Accountants and Auditors (KICPAA). Before accounting and audit firms can provide their accounting and audit services to their clients, their firms need to become a member of KICPAA. Similarly, the owner or partner of an accounting and audit firm must be an active member of KICPAA.

An active member is an affiliated member that meets the requirements to be registered on the list provided in Article 9 of the Anukret referred to in Section 2 of the By-Laws, satisfying the requirements for competency, diploma and aptitude in practising the profession. KICPAA members with 3 years of practical training in the field of accounting and auditing are eligible to provide audit services.

In 2006, KICPAA started issuing license to firms allowing them to provide accounting and auditing services to their clients. This number has increased over time. In 2006, KICPAA only issued 11 licenses, but as at 31 December 2018, the number of licenses issued for accounting and audit firms is 57 (4 of them are Big 4 companies while the rest are SMPs).

SMEs in Indonesia

"SMEs in Indonesia play an important role for economic growth. Data from the Ministry of Co-operatives and SMEs indicates that SMEs in Indonesian account for nearly 97% of domestic employment and 56% of total business investment (OECD, 2018). According to the Finance Minister of Indonesia, in 2016, these enterprises represented 99% of total enterprises in Indonesia and created a total of 107.6 million employment opportunities. In addition, the Indonesian SMEs contributes 6.6% to Indonesia's gross domestic product (GDP)."

Similar to other countries, SMPs in Indonesia are categorised into micro, small and medium enterprises (MSMEs) or known as Usaha Mikro, Kecil dan Menengah (UMKM). MSMEs in Indonesia are under the jurisdiction of the Ministry of Co-operatives and SMEs, and the relevant enforcement law is Indonesian Government Law No. 20 of 2008 (Law 20/2008). Other government agencies also administer policies that involve SMEs such as the Finance Ministry, the Industry Ministry and the Commerce Ministry.

Two main definitions of SME are used, one based on turnover or net assets (excluding land and buildings used by the business) which is according to the provisions of Law 20/2008 administered by the Ministry of Co-operatives and SMEs. Another definition is by the Indonesian Central Bureau of Statistics (Badan Pusat Statistik, BPS) which is based on the number of staff employed by the businesses. This definition is used in the 2016 Indonesian Economic Census and in the BPS Survey of Micro and Small Enterprises (Survei Industri Mikro dan Kecil, or IMK), which were undertaken in collaboration with the Ministry of Co-operatives and SMEs until 2015 (OECD, 2018).

Data from the Ministry of Cooperative and SMEs show a total of 59.3 million enterprises were under the SME category in 2014. **Table 2** shows the definition used by the Ministry of Co-operatives and SMEs and Indonesian Central Bureau of Statistics.

Table 2: Definition of SMEs in Indonesia

Type	Employment -based	Assets-based (IDR million)	Revenue -based (IDR million)
Micro	1 to 4 employees	50	300
Small	5 to 19 employees	500	2,500
Medium	20 to 99 employees	10,000	50,000

Source: OECD, 2018

SMEs in Indonesia

In Indonesia, there are three professional accountancy organisations that are directly responsible for regulating accountants who are in public practice, namely, Institute of Indonesia Chartered Accountants (Ikatan Akuntan Indonesia/IAI), Indonesian Institute of Management Accountants (Institut Akuntan Manajemen Indonesia/IAMI) and Indonesian Institute of Certified Public Accountants (Institut Akuntan Publik Indonesia/IAPI).

Both IAI and IAPI support the relevant standard setters where IAI supports the Indonesian Financial Accounting Standards Board or Dewan Standar Akuntansi Keuangan (DSAK) while IAPI supports the Public Accountants Professional Standards Board or Dewan Standar Profesional Akuntan Publik (DSPAP).

All standards issued are based on international standards released by the International Accounting Standards Board (IASB) and other global standard setters such as IAASB and IPSASB.

Members of IAPI are individuals with specific qualifications and experience and they do not take member firms. As of January 2020, there are 1,432 public accountant members (licensed) and 2,794 non-public accountant members. Currently, there are around 450 SMPs in Indonesia.

SMEs in Malaysia

"Malaysia's economy has gone through a considerable transformation over the last few decades from agricultural-based to industry-based economy. It is an undeniable fact that SMEs have been the key driver of employment and economic growth in the country. The Malaysian economy consists of almost 99% SMEs where they contribute 38.3% of the country's GDP, 66% of the country's employment, and around 17.3% of Malaysia's exports. The bulk of these companies (89.2%) are involved in the services sector."

The Malaysian Ministry of International Trade and Industry (MITI) define SMEs as:

1. A small scale firm "with less than 50 full-time employees, and with an annual turnover of not more than RM10 million" or
2. A medium scale company "with between 51 and 100 employees, and with an annual turnover of between RM10 million to RM25 million".

Since 2005, a common definition for SMEs endorsed by the National SME Development Council (NSDC) has been adopted across ministries and agencies, financial institutions and regulators in SME development programmes. The definitions are as follows:

- Manufacturing (including agro-based) and manufacturing-related services: Sales turnover of less than RM25 million or full-time employees of less than 150;
- Primary agriculture and services (including ICT): Sales turnover of less than RM5 million or full-time employees of less than 50.

Given that there have been many developments in the economy since 2005 such as price inflation, structural changes and change in business trends, a review of the definition was undertaken in 2013 and a new SME definition was endorsed in July 2013 by the National SME Development Council meeting. The definition is simplified as follows:

- Manufacturing: Sales turnover not exceeding RM50 million or full-time employees not exceeding 200 workers, or
- Services and other sectors: Sales turnover not exceeding RM20 million or full-time employees not exceeding 75 workers.

A business is deemed as an SME if it meets one of the criteria listed, namely sales turnover or full-time employees, whichever is lower. **Table 3** summarises the definition of SME categories for the respective sectors.

SMEs in Malaysia

In Malaysia, the services sector refers to all types of services including distributive trade, hotels and restaurants, business, professional and ICT services, private education and health, entertainment, financial intermediation and manufacturing related services such as research and development (R&D), logistics, warehouse, engineering etc.

Table 3: Definition of SMEs in Malaysia

Type	Employment-based	Revenue-based (RM million)
Micro	Less than 5	Less than 0.3
Small	From 5 to less than 30	From 0.3 to less than 3
Medium	From 30 to less than 75	From 3 to 20

Source: SME CORP Official Website (retrieved on 5 October 2020)

According to SMEs Census 2011, there were 580,985 SMEs recorded in the services sector which constitute 90.1% of total SMEs. These SMEs can be further divided into sub-sectors such as telecommunication, private education, healthcare, finance, insurance, professional and business services, wholesale & retail trade, restaurants and accommodation.

Currently, there are around 1,473 SMPs in Malaysia that provide business advisory services needed by the SMEs. Small and medium practices (SMPs) in Malaysia provide services on business advisory needed by the SMEs. Accounting SMPs in Malaysia fall under the category of "Professional, scientific and technical services" (Musa & Chinniah, 2016).

Malaysian Institute of Accountants (MIA) is the umbrella body for the accountancy profession in Malaysia. MIA's responsibilities include education and training, quality assurance and enforcement, maintaining credibility of the profession and public interest.

Apart from this, another accountancy body in the country, the Malaysian Institute of Certified Public Accountants (MICPA) established in 1958 also plays a key role in setting relevant accounting standards and providing technical advisory for Malaysian regulatory bodies. Among the functions of this professional accountancy body are to recruit, educate, train and assess (by means of examination) its members to maintain high standards of practice and professional conduct in relation to public practice, industry, commerce, education and the public service. MICPA and MIA maintain close working relationship with each other.

In Malaysia, accountants are protected under the provisions of the Accountants Act 1967. In Malaysia, accountants are protected under the provisions of the Accountants Act 1967.

SMEs in Singapore

As of April 2019, there were an estimated 220,000 SMEs in Singapore, with the services sector constituting close to 80% of these enterprises (OECD/ERIA, 2018). The main body responsible for elaborating SME policy in Singapore is the Enterprise Singapore (ESG), which is responsible for formulating, leading and coordinating all enterprise development strategies, including strategies for start-ups and SMEs.

Singapore's current SME definition took effect in 2011. The new definition was elaborated following an observation that the country's production structure was changing, moving towards more asset-light industries (those possessing fewer fixed and more intangible assets). The definition's fixed assets criterion was replaced with sales turnover, and the threshold was determined based on a corporate transition matrix analysis and a longitudinal study of firms in Singapore (Sam, 2011).

According to the study, maximum turnover for a medium company is SGD100 million. It is highly unlikely for companies having turnover higher than SGD100 million, because such companies possess the skills and resources to sustain growth organically. The new definition is the dominant definition used by the government.

SME classification can be determined by either annual sales turnover, shareholdings and employment size. Consistently, an SME in Singapore is categorised based on the number of employees as reported by MTI as illustrated in **Table 4**.

"SMEs in Singapore have always contributed more than 50% to the total enterprise value addition in the economy, showing the increasingly important role of the country's SMEs. SMEs account for an estimated two-thirds of all employment and contribute just short of SGD200 billion to the economy (Teo, 2013)"

Table 4: Definition of SMEs in Singapore

Type	Employment-based	Revenue-based (SGD million)
Local Small and Medium with at least 30% local shareholdings	Not exceeding 200 employees	Not more than SGD100 million

Source: <https://www.mti.gov.sg/Newsroom/Press-Releases/2013/03/GOVERNMENT-ENHANCES-SUPPORT-FOR-SMEs-TO-ACHIEVE-QUALITY-GROWTH>

The Institute of Singapore Chartered Accountants (ISCA) is the national accountancy body of Singapore. Established in 1963, ISCA's vision is to be a world-class accountancy body of trusted professionals, contributing towards an innovative and sustainable economy. ISCA has over 32,000 members in Singapore and around the world.

SMEs in Thailand

According to ASEAN SME Policy Index 2018, SMEs in Thailand demonstrate a structural contribution to the economy similar to those in OECD countries. They account for a significant share of employment (78.5% of total employment in 2016) and GDP (42.2% of the country's GDP). SMEs are predominantly found in the trade sector (41.7%), service sector (39.58%), manufacturing sector (17.34%) and agricultural sector (1.41%).

Thailand's SMEs definition was formulated in 2000 with the passing of the SME Promotion Act. This definition is in line with the European Commission and World Bank's definitions in using number of employees as a criterion to classify SMEs. A new definition of SMEs was announced by OSMEP in 2019 and effective in 2020 stating micro SMEs as firms in these industries: 1) manufacturing, and 2) services, retail and wholesale. In Thailand, SMEs are generally defined based on the number of employees and fixed capital (excluding land and properties) as introduced by the Ministry of Industry on September 11, 2002 (OECD, 2016). **Table 5** shows the definition of SMEs in Thailand.

Table 5: Definition of SMEs in Thailand

Type	Employment-based	Assets-based (THB million)
Micro	Less than 5	Less than 1.8
Small	5 to less than 30	Not more than 50
Medium	30 to less than 100	50 to 300

Source: SME Official website (retrieved on 20 May 2020)

"There are around 3 million SMEs in Thailand in 2016, accounting for 99.7% of the total number of enterprises in the country. SMEs are the lifeblood essential to the country's economic vitality."

Thailand Federation of Accounting Profession (TFAC) is a professional accountancy organisation that focuses on servicing their members, the profession and public interest. TFAC is a member IFAC. To become an auditor with CPA qualification, TFAC members with 3 years working experience need to sit for accounting, auditing, tax and law examinations. To date, there are 10,317 CPA qualified auditors in Thailand, however not all are active members.

The Accounting Profession Act B.E. 2547 identifies the controlled accounting profession in 2 areas, namely, auditing and accounting. This act is a new law that replaced the Auditor Act B.E. 2505. Any person who wants to provide auditing and accounting services needs to be a member of the Thailand Federation of Accounting Professions (TFAC), must be qualified and is not prohibited from practising auditing or accounting by the law.

A Common Definition of ASEAN SMPs

There is currently no standard definition of SMPs used among ASEAN countries since some of them classify their professional accounting firms into different sizes; micro, small and medium. However, there are three common features used by these countries in defining their SMPs namely employment-based, assets-based and revenue-based with different measurements.

Adding to this, some of the three common features are not adopted and practised in particular countries, for example, Malaysia does not use asset-based criteria, while Thailand and Cambodia do not implement the revenue-based criteria. It is evident that for asset-based criteria, all countries (except Malaysia and Singapore) use this feature to define SMPs ranging from a maximum value of approximately IDR10 billion in Indonesia to USD0.5 million in Cambodia.

Meanwhile, for revenue-based criteria, Indonesia imposes a maximum revenue of approximately IDR50 billion whilst Singapore and Malaysia impose a maximum revenue of not more than SGD100 million and RM20 million respectively to be classified as an SME.

The definition of SMPs based on number of employees is the common definition used in all five countries in the region. The highest number of employees for SMEs is recorded in Singapore with 200 whilst in Indonesia, the maximum number for medium size SMEs is 99. Therefore, after thorough investigation, definition of SMPs in ASEAN could be referred to using the employment-based criteria as we found that all selected ASEAN countries use this particular reference to define their SMPs.

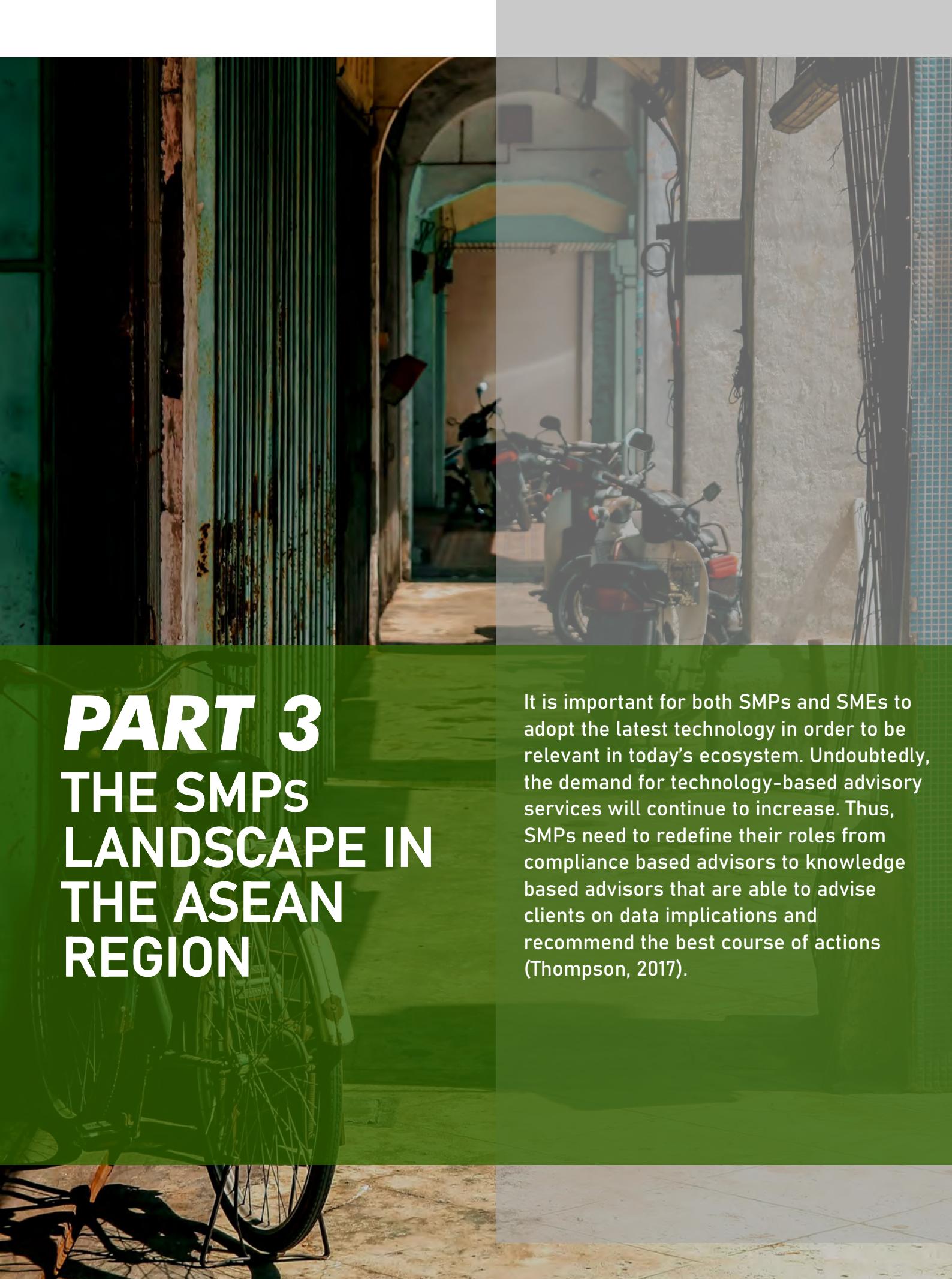
The use of this common reference will be useful for future researchers from the academia and industry to perform their studies associated with ASEAN SMPs in various fields.

In sum, for the context of this research, the employment-based criteria are chosen to produce common definition of SMPs in the ASEAN region. Nevertheless, it is fair to conclude that the other two features (assets-based and revenue-based) can be used to define SMPs in the ASEAN region depending on the research context as shown in [Table 6](#).

Table 6: Summary of SMPs by countries

Features	Singapore	Malaysia	Indonesia	Thailand	Cambodia
Governing Bodies	Singapore Ministry of Trade and Industry	SME Corporation, CCM, Ministry of Finance	Financial Services Authority of Indonesia, Ministry of Finance	Office SME of Promotion (OSMEP), Thai Ministry of Industry	SME Sub-Committee, Royal Government of Cambodia, NAC
Professional Accountancy Organisations	ISCA	MIA, MICPA	IAI, IAMI & IAPI	TFAC	KICPAA
Total Number of SMPs	708	1,473	450	4,756	53
Characteristics of SMPs	Employment-based	Local SMEs with at least 30% local shareholdings: not exceeding 200 employees	Small: 5 to 29 employees Medium: 30 to 75 employees	Small: Between 5 to 19 employees Medium: 20 to 99 employees	Small: Less than 30 employees Medium: 30 to 100 employees
	Assets-based	Not used in Singapore	Not used in Malaysia	Small: IDR500 million (USD34,106) Medium: IDR 10 billion (USD682,083)	Small: <THB50 million (USD1,600,254) Medium: THB50 million (USD1,600,254) to THB300 million (USD9,601,529)
	Revenue-based	Local SMEs with at least 30% local shareholdings: not more than SGD100 million (USD73,761,820)	Small: RM0.3 million (USD72,184) to less than RM3 million (USD721,841) Medium: RM3 million (USD721,841) to RM20 million (USD4,812,544)	Small: IDR2.5 billion (USD170,532) Medium: IDR50 billion (USD3,410,651)	Not used in Thailand Not used in Cambodia

*Conversion rate for USD currency is as of 23rd October, 2020.



PART 3

THE SMPs LANDSCAPE IN THE ASEAN REGION

It is important for both SMPs and SMEs to adopt the latest technology in order to be relevant in today's ecosystem. Undoubtedly, the demand for technology-based advisory services will continue to increase. Thus, SMPs need to redefine their roles from compliance based advisors to knowledge based advisors that are able to advise clients on data implications and recommend the best course of actions (Thompson, 2017).

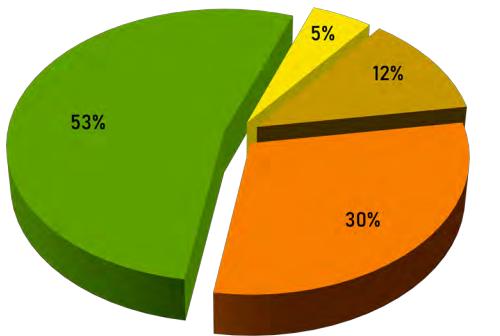


Figure 1: Legal status of the firm

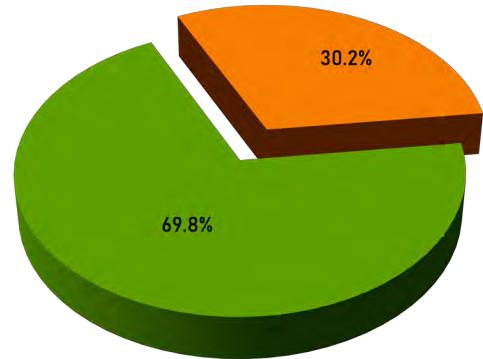


Figure 2: Number of partners

SMPs in the ASEAN region are diverse in terms of their legal status, number of partners and employees, number of branches, estimated revenues and client classification. **Figure 1** presents the legal status of ASEAN SMPs collected via the questionnaire survey. Most respondents are from partnership firms (53%) and sole proprietorship firms (30%), while 12% came from private limited companies. The remaining of the SMPs are limited liability firms (5%). The result shows that most of the SMPs are partnership firms.

Figure 2 highlights the number of partners/CPA holders. A majority of the respondents (69.8%) have less than 5 partners or CPA holders in their firm whilst 30.3% have more than 5 partners or CPA holders in the firms.

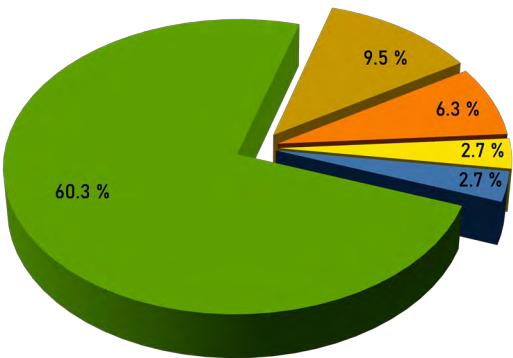


Figure 3: Number of employees

Based on **Figure 3** more than half of the respondents (60.3%) stated that they have less than 20 employees in their firms. This result is consistent with the definition of SMEs where most of them have between 11 to 50 employees.

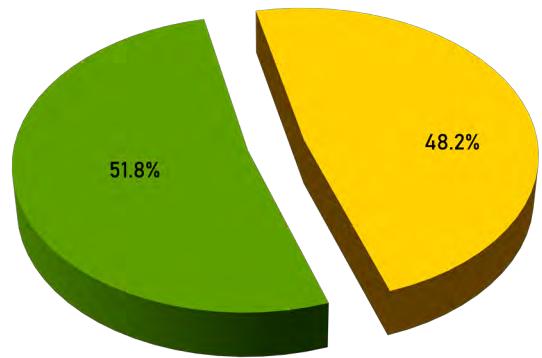


Figure 4: Number of branches

Figure 4 shows whether the SMPs in this research have office branches aside from their main office. Almost half of the respondents (48.2%) stated that their firms do not have additional office branch while the remaining 51.8% stated that their firms have at least 1 additional branch.

SMPs

Background

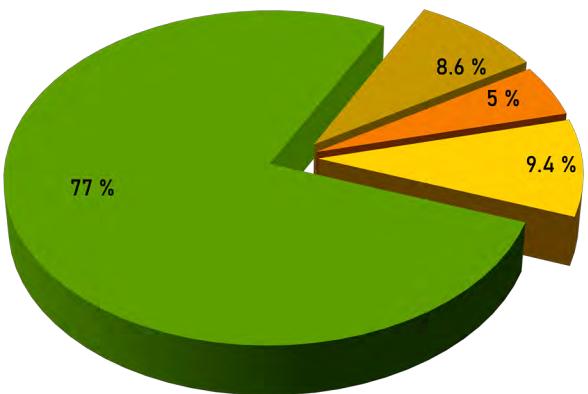


Figure 5: Annual revenue (USD)

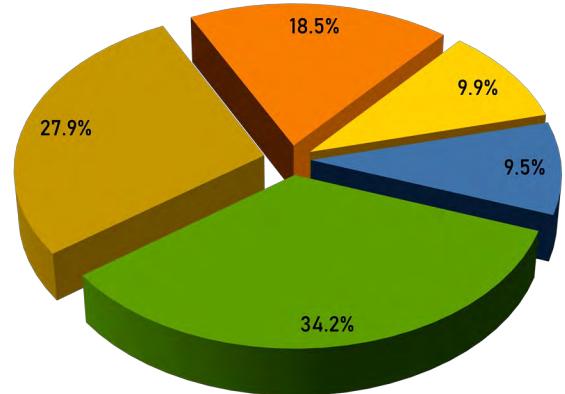


Figure 6: Client profile

Based on **Figure 5**, a majority of the respondents (77%) stated that their firms have an estimated annual revenue of less than USD500,000. This indicates that most firms are operating in small scale due to their low annual revenue amount. The results are also consistent with the definition of SMEs where the income range is between USD50,000 to USD250,000.

Figure 6 describes the clients' profiles of the respondents in this study. A majority of them (34.2%) serves only SME clients, and approximately 19.4% of the respondents have, at most, 50% of their clients from SME companies. The finding indicates that most of the respondents deal with SME clients rather than public listed or big companies.

SMPs

Background

Items	%
High Investment Costs	71.2
Insufficient Knowledge of Employees	59.0
Unresolved Questions Concerning Data Security	30.2
Lack of Standards, Regulations or Certifications	27.9
Unclear Economic Benefits	20.3
Unclear Legal Situation Concerning the Use of External Data	15.3

Table 7: Firms' challenges to a successful technology adoption

Most respondents strongly agreed that it is a significant challenge to adopt latest technology in their firms. Asked on their firms' level of readiness for current technology adoption, the respondents opined that their firms are ready for current technology adoption with a mean score of 3.68. Interviews with the SMPs found budget constraint, lack of support from stakeholders and lack of expertise among the employees to be the biggest challenges in developing and adopting technology.

As shown in **Table 7**, a majority of the respondents (71.2%) stated that their firms face the challenge of high investment costs, resulting to their inability to invest in latest technology. The second biggest challenge is insufficient knowledge of employees (59%). This may be due to lack of IT training provided for the employees.

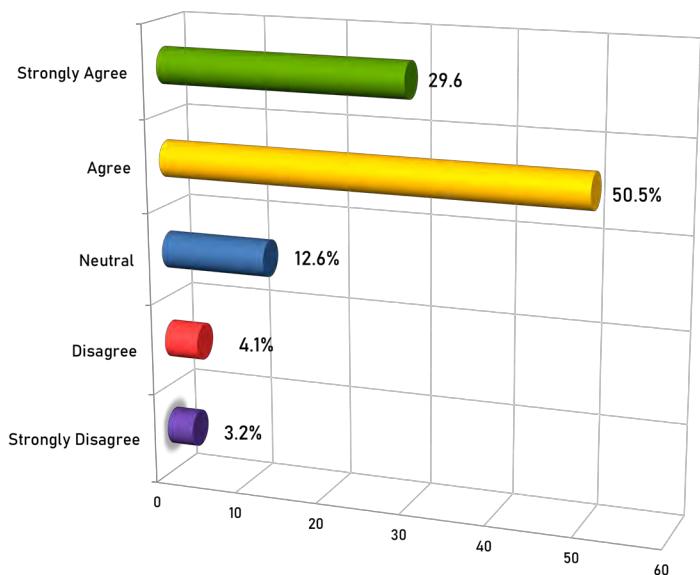


Figure 7: IoT affects current business operations

Other challenges faced by the SMPs are unresolved questions concerning data security (30.2%), unclear economic benefits (20.3%) and unclear legal situation concerning the use of external data (15.3%).

Although the respondents opined that technology development and implementation is a significant challenge, 47.7% agreed that their firms are ready for technology adoption. This shows that although adopting technology is a challenge, the SMPs are ready to shift their way of working to follow the latest trends and demands as shown in **Figures 7–9**.

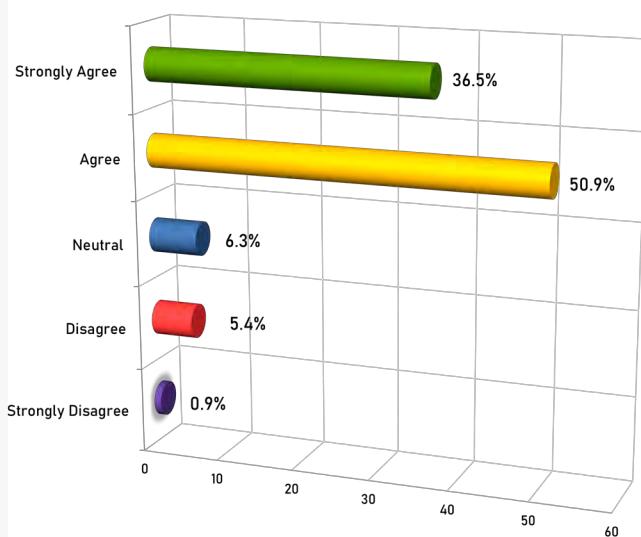


Figure 8: Technology adoption is a significant challenge

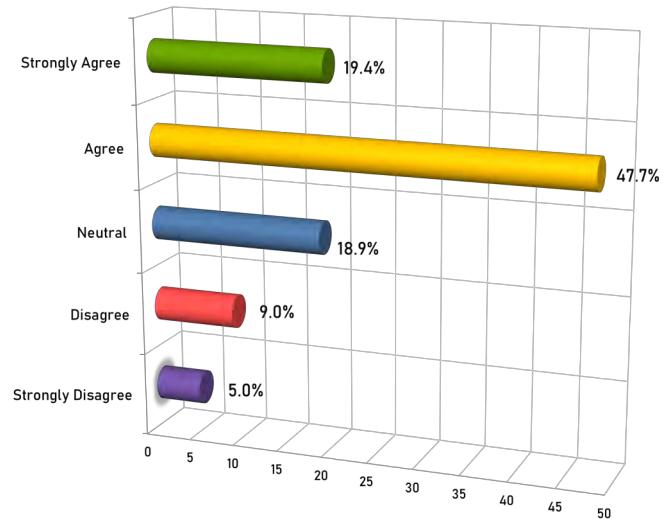


Figure 9: Firm is ready to adopt IT

Items	%
Mobile Technology	80.2
Cloud Computing	47.7
Internet of Things	47.3
Big Data Analytics	33.3
Machine Intelligence	19.4
Artificial Intelligence	14.9
Robotics	6.3
Others	1.8

Table 8: Current technology environment

The respondents were also requested to identify whether their firms are familiar with the current technology environment. Based on the results shown in **Table 8**, the most popular technology used is mobile technology (80.2%). The reason is because mobile phones can be one of the most important means for people to connect to the internet and double as a medium of telecommunication. Cloud computing (47.7%) ranked second, followed closely by Internet of Things (47.3%).

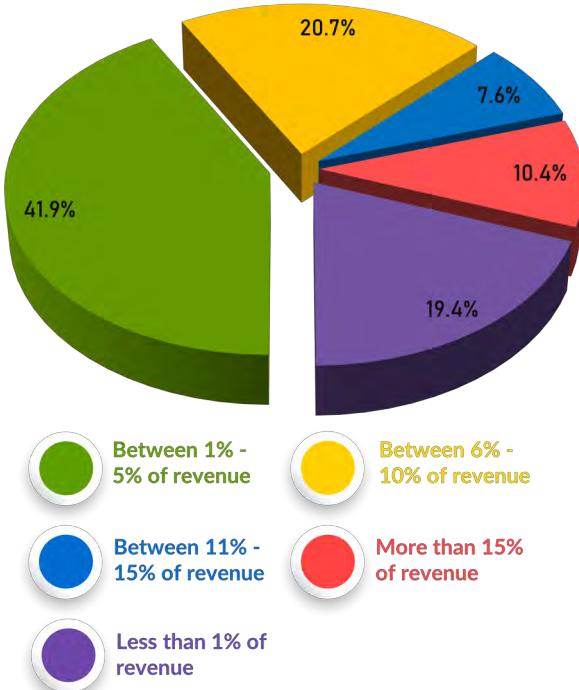


Figure 10: Investment in IT

Advanced applications and software are not popular among the SMPs mainly because there is not much demand from the clients to use such application and software. Another reason may be due to their premium price tag. Advanced software and applications as listed in **Table 8** include Big Data Analytics (33.3%), Machine Intelligence (19.4%), Artificial Intelligence (14.9%), Robotics (6.3%) and Others (1.8%).

This research examined the SMPs' investment in information technology in terms of percentage of revenue. Based on **Figure 10**, most firms in this study spent around 1% to 5% of their revenue for information technology (41.9%), followed by 6% to 10% (20.7%), and less than 1% (19.4%). On the other hand, some firms spent more on advancing their information technology adoption, around 11% to 15% (7.6%) and above 15% of their total revenue (10.4%). The SMPs are not keen to invest in technology because

Items	%
Increase Productivity and Efficiency	81.5
Better Planning and Controlling	72.5
Faster Time	68.0
Human Skills Enhancement	54.5
Greater Flexibility	51.8
Higher Customer Satisfaction	44.6
Agility	26.6
Encourage a Desired Culture	23.9

Table 9: Firms' Expectations from Technology Adoption

they are customer oriented, thus demand from their clients is the top priority. If there is no demand from their clients to use such application or software, then they will not spend their money on unnecessary investment.

This research also identified the firms' expectations from technology adoption. As shown in **Table 9**, most respondents (81.5%) agreed that technology adoption increases productivity and efficiency of the firm, about 73% of the respondents voted that technology adoption has a good impact on planning and controlling while 68.0% of the respondents noted that it will improve workers efficiency (faster time to execute jobs). Next, 54.5% agreed that technology adoption enhances employees' skills, provides greater flexibility (51.8%), improves customer satisfaction (44.6%), increases the firms' agility (26.6%), and encourage a better company culture (23.9%).

TECHNOLOGY Development

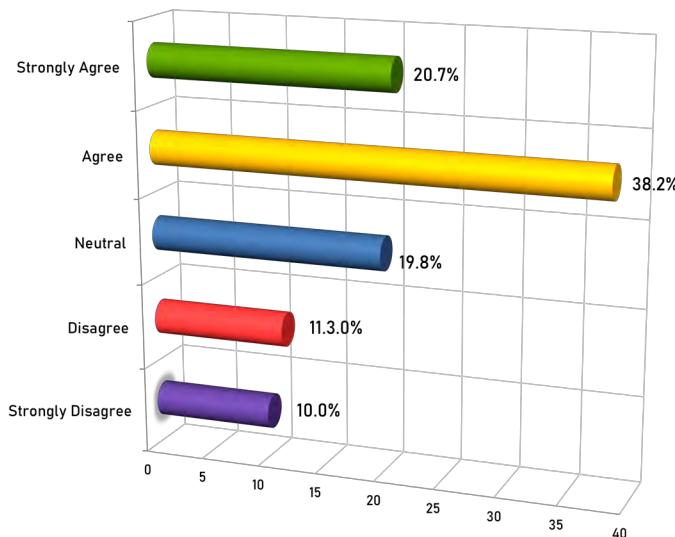


Figure 11: Firm's use of appropriate IT tools

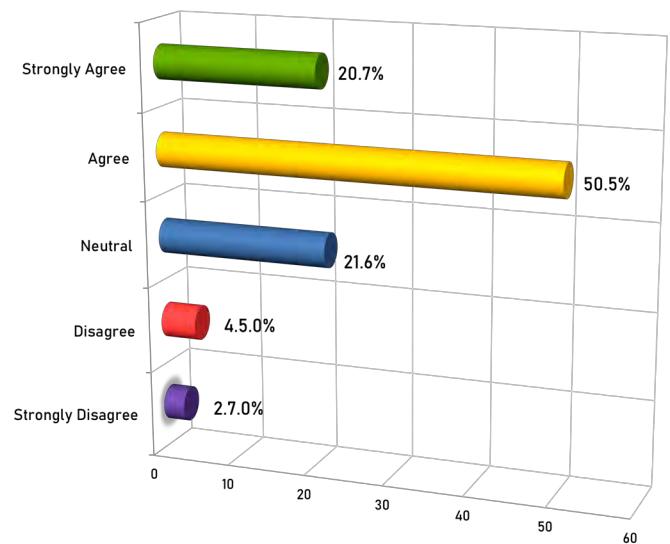


Figure 12: Firm's use of IT to improve productivity

Although technology adoption among the SMPs is still very minimal, it however has a significant impact on the SMPs business environment. 38.2% agreed that their firms use information technology tools and platform to facilitate business process and client engagement (Figure 11), improve productivity (Figure 12) and they are aware on the pros and cons of IT (Figure 13).

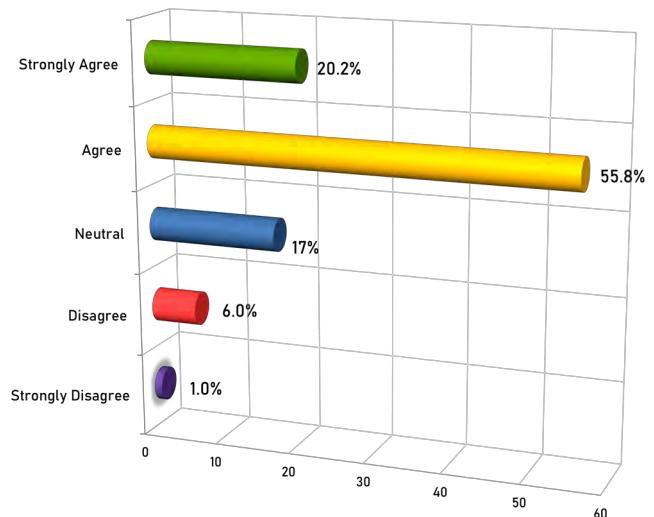


Figure 13: Firm's awareness on positive and negative impacts of IT

Items	%
Computer / Laptop / Notebook	97.3
E-Mail	84.2
Smartphones or Tablets (On-The-Go Gadgets)	69.4
Internet Service (Fixed or Mobile Broadband)	70.7
Video Conferencing (e.g. Skype & WhatsApp Video)	55.9
Official Company Website	51.8
Storage Device	44.1
Server	45.0
Presentation Software	42.8
Social Media (e.g. Facebook & Instagram)	41.9
Internet of Things	23.9
Cloud Computing	11.7
Voice Mail	14.0
Analytics Tools / Visualisation	11.3
Business Process Management	9.9
Business Process Modelling	8.1
Blockchain Technology	1.9
VMware F3Fusion	0.5
VMware Workstation	0.5

Table 10: Knowledge, tools and platform

Table 10 shows the information technology tools and platforms used by respondents to facilitate their daily operations. The most popular picks are computers, laptops or notebooks (97.3%), followed by e-mails (84.2%), internet service (70.7%), smartphones or tablets (69.4%), video conferencing (55.9%) and official company website (51.8%). VMware F3Fusion and VMware Workstation only received 1 response each while VMware Horizon Flex is not used by any respondent. 1 respondent stated that his/her firm does not use any kind of information technology tools and platform.

From these results, it is evident that SMPs mainly use basic information technology tools and software. They rarely utilize advanced level software and applications such as VMware, F3Fusion and Horizon Flex. This may be

System and Software Used in the Firms	%
Office Productivity Tools (e.g. Ms Office, Ms Outlook, Ms Excel, Ms Access)	73.5
Accounting & Financial Management Software (e.g. UBS, SQL, QuickBooks)	68.5
Enterprise Content Management	21.2
Time Cost Management Software (e.g. Superior Time cost & eTimeSheet)	18.9
Human Resources Software	18.0
Analytic & Reporting Software	18.0
Planning and Scheduling (e.g. Project Management Software)	13.1
Chatbot (Cloud Messaging)	10.4
Enterprise Resource Planning (e.g. SAP, Oracle)	9.5
Sales & Customer Management	7.7
Machine Learning and Artificial Intelligence	2.7
Robotic Process Automation	0.9

Table 11: System and software used in the firms

due to lack of demand from their clients to use such technology. To make matters worse, such technology requires high level of investment which is usually unafforded by the SMPs.

The respondents were requested to identify types of systems and software used by their firms in improving productivity. Based on **Table 11**, office productivity software has the highest response rate with 73.5% followed closely by accounting and financial management software with 68.5%. Since majority of the SMPs clients are among the SMEs, hence UBS, SQL and QuickBooks are the most relevant and useful software for accounting and auditing services.

The SMPs do not rely on software and applications for management, human resource, planning and the likes – only less than 25% of the firms use such services. Meanwhile, the least used software among the SMPs is sales and customer management software (7.7%).

Items	%
None	36.5
Specialised/Customised Audit Software (written by the auditors)	27.5
Audit Management Software (e.g. Audit Express – AXP, CCH)	23.4
Generalised Audit Software (e.g. ACL, Arbutus, IDEA, EAS)	22.1
Statistical Package (e.g. SAS)	8.1
Business Intelligence (e.g. Crystal Report, Business Objects)	5.4
Visualisation Tools (e.g. Tableau, Qlikview, Qlik Sense, PowerBI)	4.5
Others	2.7

Table 12: Computer-aided audit technique (CAAT) used in the firms

Shockingly, there are SMPs that do not use any software or system to improve their productivity (4.5%).

The respondents were also requested to state the type of computer-assisted audit technique (CAAT) used by their firms. **Table 12** shows that 36.5% respondents stated that they did not use any type of CAAT, 27.5% use specialised or customised audit software, 23.4% use audit management software, and 22.1% use generalised audit software. The least used software programmes include statistical software (8.1%), business intelligence (5.4%), visualisation tools (4.5%), and others (2.7%). The reason is due to no demand from their clients to use such software and system in performing their audit and accounting services.

Items	%
Accounting Software (e.g. UBS, SQL, Xero)	64.4
None	28.4
Tax Software (e.g. iBizzTax)	22.1
Company Secretarial Software (e.g. COSEC, XBRL Related Software Adoption)	14.9
Others	2.7

Table 13: Software used in the firms to provide other services

This research also requested the respondents to identify the software used to provide other services offered by the firms as depicted in **Table 13**. A majority of the respondents (64.4%) stated that they use common accounting software, while 28.4% mentioned that they did not use any type of software. Next, 22.1% respondents stated that their firms use tax software, 14.9% respondents use company secretarial software, while 2.7% respondents use other types of software which include EWP, EY Tools, ProSystem Audit Software, Simply Ace, and Web Online. Thus, it is evident that a majority of the SMPs only use the most basic accounting, company secretarial and tax software to provide other services to their clients.

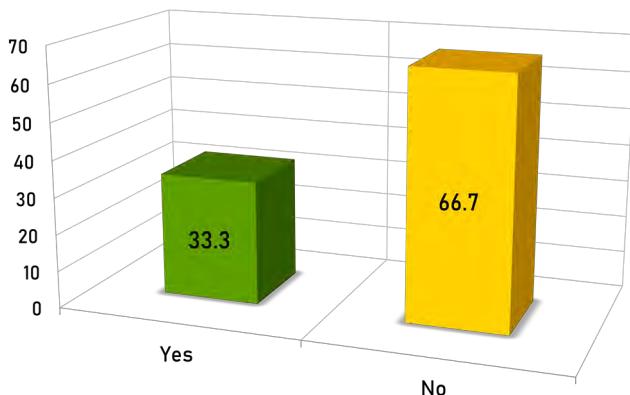


Figure 14: Hired IT professionals

The respondents were asked to state whether their firms employed IT professionals to enable them to provide IT advisory services. Based on **Figure 14**, only 33.3% respondents do employ IT professionals while the remaining 66.7% respondents do not hire such employee. This answers the question why SMPs do not provide technical and advisory services on IT software and system – because a majority of them do not have the manpower to offer such service.

Items	%
None	73.0
Certified Information System Auditor (CISA)	20.7
Certified Information System Security Professional (CISSP)	6.3
Qualified Security Assessor (QSA)	4.1
Others	3.2

Table 14: Certifications obtained by IT advisory team

Table 14 shows the certifications obtained by the firms' IT advisory team. A majority of the respondents (73%) stated that their IT advisory team has no relevant certification, while the largest amount of certification obtained by the IT advisory team is on Certified Information System Auditor (CISA) (20.7%). This result supports the findings that a majority of the SMPs do not have the expertise to provide advice on IT services.

Items	%
None	69.4
Web Services	14.0
Service Oriented Integration (SOI)	8.1
Enterprise Application Integration (EAI): (e.g. SAP solution, Oracle, IBM, Web Methods)	6.8
Data Warehouse Integration:(e.g. Logistics Integrated Database (LIDB), SAP solution, Oracle)	4.5
Business-to-Business (B2B) Integration: (e.g. Electronic data interchange (EDI), Extensible Mark-up Language (XML))	3.6
Service Oriented Architecture (SOA)	3.2
Point-to-Point Integration: (e.g. IBM MQ Series, WebSphere)	2.7
Application Server Integration:(e.g. Oracle application server, Siebel's Java Data Beans, SAP's JCA (J2EE Connector Architecture))	2.3
Database-to-Database Integration: (e.g. Pervasive Integration Architect, Data Mirror's Castellar Hub, SAP solution)	1.8
Simple Object Access Protocol (SOAP)	0.5
Java API for Web Services	0.5

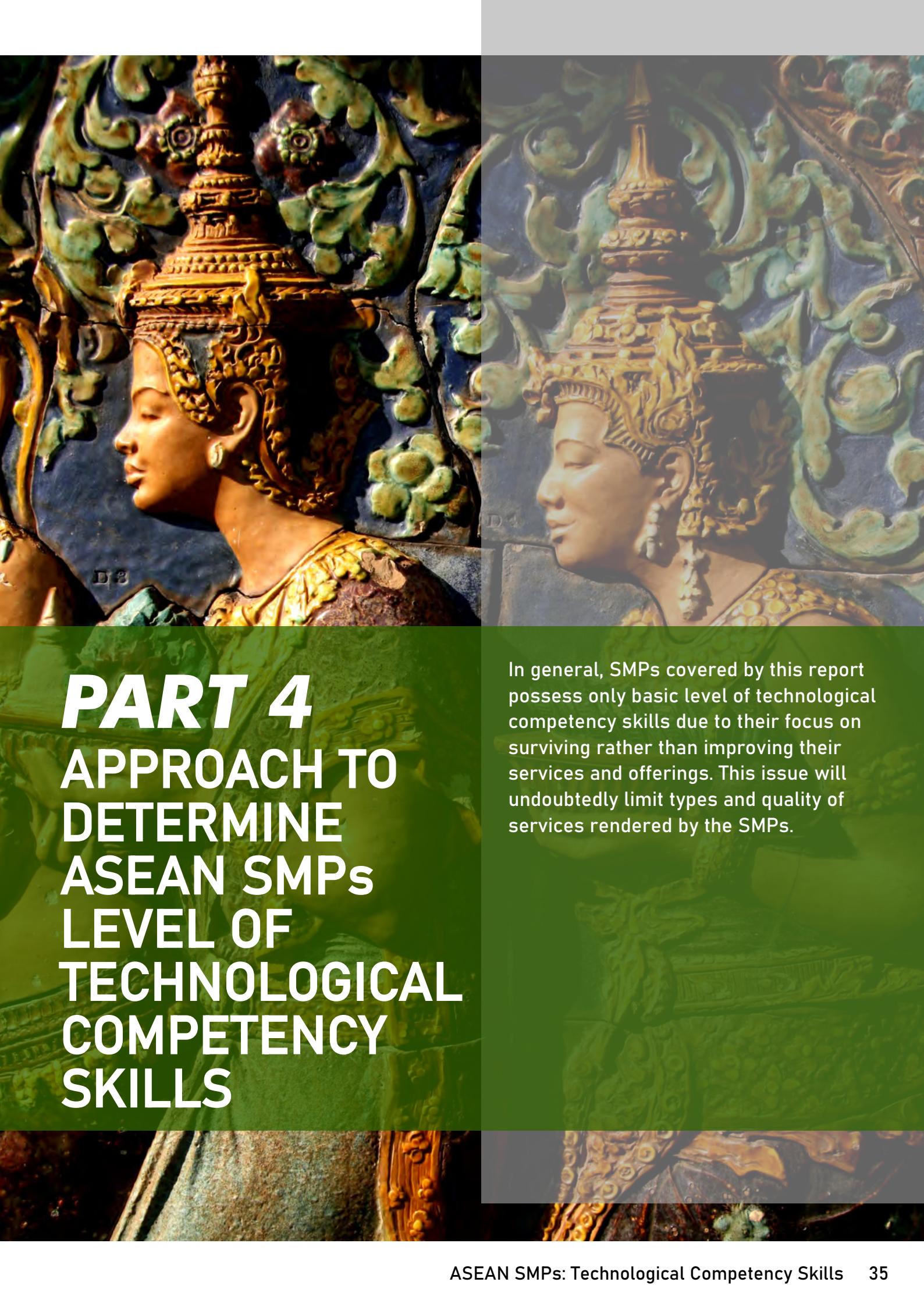
Table 15: Firm IT advisory services

The respondents were asked to identify the types of IT advisory services provided by their firms. **Table 15** indicates that almost half of the respondents (49.1%) stated that their firms do not provide any kind of IT advisory services, followed by provision of IT audit services (22.5%), IT trainings (18.9%), internal IT audit (16.7%), and IT general control (ITGC) assessment (14.0%). Next in the rankings is IT governance and IT risk assessment (10.4%), digital audit (7.2%), IT risk management and assurance (6.8%), IT sourcing or outsourcing (5.4%) and IT project management and advisory (5.4%). The other advisory services are relatively small, at most only 5.0% of the SMPs offer them. The main reason for the SMPs not providing IT advisory services is due to lack of expertise as these services require expensive technical trainings.

Items	%
None	49.1
IT Audit Services	22.5
IT Training (e.g. Accounting Software)	18.9
IT Internal Audit	16.7
IT General Control (ITGC) Assessment	14.0
IT Governance and IT Risk Assessment	10.4
Digital Audit	7.2
IT Risk Management and Assurance	6.8
IT Sourcing / Outsourcing	5.4
IT Project Management and Advisory	5.4
Automated Control Testing	5.0
Website Design and Development	5.0
Personal Data Protection	4.5
Disaster Recovery and Business Continuity Planning	4.5
Software Development and Customisation	4.1
IT Tax Investigation	3.2
Vulnerability Assessment	3.2
Cybersecurity Preparedness Review	2.7
Extensible Business Reporting Language (XBRL) Related Software Adoption	1.8
Penetration Testing	1.8
ISO 27001:2005 Gap Analysis and Mapping	1.8
System Security and Hardening Assessments	1.4
Others	1.4

Table 16: Integration system services provided by the firm

Table 16 provides results on integration system services offered by the SMPs. Based on the table, a majority of the respondents (69.4%) stated that their firms do not provide any kind of integration system services. The highest integration system service offered by the SMPs is web services (14.0%) followed by service-oriented integration (SOI) (8.1%). As discussed earlier, a majority of the SMPs only provide the most basic software and systems, thus explaining why not many of them offer integration system services to their clients.



In general, SMPs covered by this report possess only basic level of technological competency skills due to their focus on surviving rather than improving their services and offerings. This issue will undoubtedly limit types and quality of services rendered by the SMPs.

Steps to Determine SMPs Technological Competency Skills

Identifying Technology Used by SMPs

The first step is to identify the technology used by the SMPs through a survey. In developing the questionnaire for the survey, relevant technology and software were identified via textbooks, prior literature and browsing through SMPs websites. Next, discussion with two practising SMP auditors were conducted to identify the most relevant software and technology adopted in their firms. Technology used by the Big 4 firms may not be appropriate for SMPs due to the difference in their financial capabilities and client orientations. Based on the discussion, a list of technology was produced according to the comments and suggestions from the practitioners. Irrelevant software and systems were taken out and only technology relevant for SMPs was added to the list (refer to Appendix 5).

Categorising SMPs Technology

The next step is categorising the technology according to an existing technology skills framework for SMPs. The purpose is to differentiate the technology into a few categories which are based on the functions of an SMP. The categories are:

- Technology for firm operation, and
- Technology to serve SMPs clients.

Based on these two categories, the technology is further categorised into three other segments which are:

- Technical capability,
- Firm innovativeness, and
- E-business practices.

These categories are based on Sulaiman et al.'s (2010) professional services framework on technology competency skills from an organisational perspective.

Technical capability refers to infrastructure adequacy and technical knowledge of a firm, while firm innovation refers to the effort to increase or improve technology adopted in a firm. Meanwhile, e-business practices relate to a firm's initiatives to use the internet to introduce and promote and render services to its potential / current clients.

Based on these two steps, the survey questionnaire was revised to include the list of technology identified in Step 1. The questions were categorised based on the proposed themes identified in Step 2 (Sulaiman et al., 2010) (refer to Appendix 6).

Determining SMPs Level of Technology Usage

The third step is determining the level of technology usage. In this stage, two academics and one representative from industry with accounting information system and information technology backgrounds were approached to individually identify the SMPs' level of technology usage. The experts categorised the list of technology into three levels: basic (1), intermediate (2) and advanced (3) levels (refer Appendix 7). The expertise from industry and experience of both academics in the field of information technology are the main reference in determining and classifying the levels of technology.

Steps to Determine SMPs Technological Competency Skills

They classified the SMPs information technology usage based on several key factors such as whether it is widely used by SMPs, duration of the technology in the market, complexity of the technology, and cost to develop and acquire the information technology. The two academics were asked to classify the technologies separately and then their responses were compared to see whether both experts share the same view on the matter and the results show that they do not have very significant classification differences. [Table 17](#) summarises the three themes and levels of technology based on the views from the panel of experts.

Items	Technology Level			Total
	Basic	Intermediate	Advanced	
Technical Capability	5	11	30	46
Firm Innovativeness	3	5	11	19
E-Business Practices	5	5	3	13
Total	13	21	44	78

Table 17: Theme of technology competency skills

Level of SMPs

Technological Competency Skills in the ASEAN region

Results from the three themes were then calculated to obtain the total scores for basic, intermediate and advanced technological competency skills. The calculation is as follows: In the questionnaire, the respondents were required to answer 'Yes' or 'No' for each technology. Each 'Yes' answer will be recorded as '1' while 'No' will be recorded as '0'. The maximum score that can be achieved by a respondent for this questionnaire equals to the total number of questions, which is 78 (refer Appendix 5). Scores for all three levels of technology competency skills were then compared. The highest percentage recorded will indicate the level of SMPs technological competency skills in the region.

Table 18 shows the summary of the results where 62% of the respondents have basic technological competency skills, 17% have intermediate technological competency skills and only 6% of the respondents have advanced technological competency skills. The results also show overall technological competency skills score of 18%. Such results indicate that in general, SMPs in the ASEAN region possess only basic level of technological competency skill.

Table 18: Matrix of technology competency skills of ASEAN SMPs

Items	Technology Competency Skills			%
	Basic	Intermediate	Advanced	
<i>Technical Capability</i>	70.1%	19.0%	5.9%	16.0%
<i>Firm Innovativeness</i>	32.9%	8.2%	5.9%	10.7%
<i>E-Business Practices</i>	71.3%	19.4%	1.7%	35.2%
Total	62.0%	16.5%	5.6%	17.9%



PART 5

ASEAN SMPs TECHNOLOGICAL COMPETENCY SKILLS FRAMEWORK

There is similar level of competencies possessed by the SMPs across different countries. They have adequate level of technology competency and capability to conduct their day-to-day operations and provide services to their clients. The SMPs view technology development and implementation as a significant challenge due to high investment costs and insufficient knowledge, skills and ability of their employees.

SMPs Technological Competency Skill in Cambodia

Technology Capability

Interviews were conducted with representatives from SMPs on the current technologies used to operate their businesses and serve their clients. The SMPs shared the view that currently, their clients do not require them to employ sophisticated technology in operating their businesses. The SMPs would use Microsoft Excel and Word to audit files, record audit fees and list their existing clients. As noted by Practitioner F:

Currently we only use Microsoft Word. No accounting software yet.

The findings show that the SMPs acquire the technology locally. As noted by Practitioner F:

For QuickBooks, we buy the software locally and purchase the license online. Our clients are not really familiar with the software.

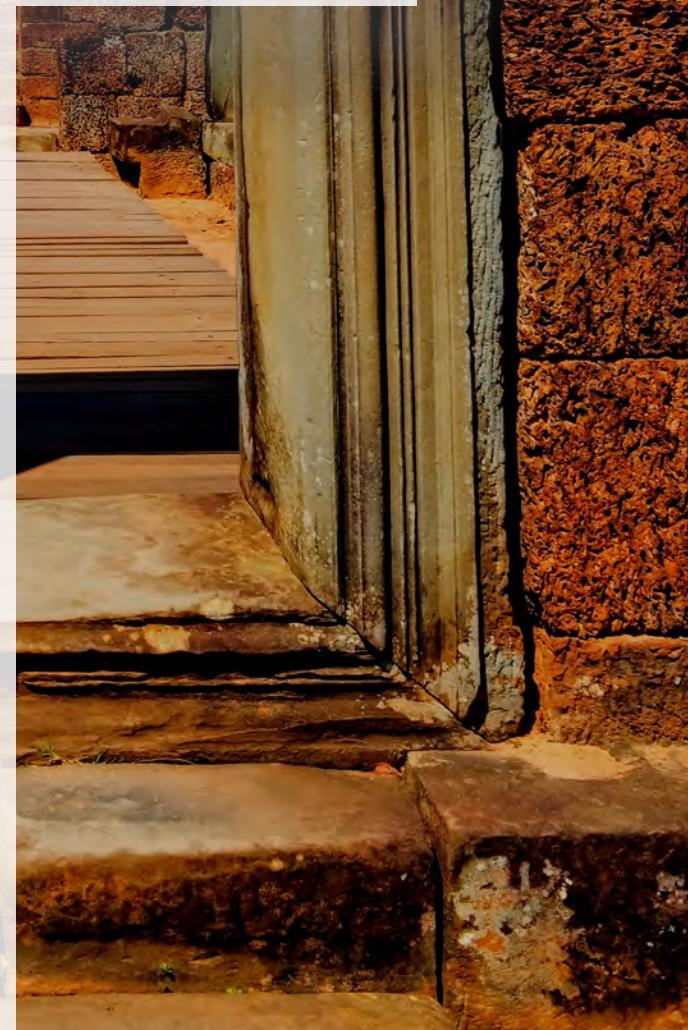
In addition, most of the SMPs provide advisory or accounting services related to technology using Microsoft Excel because they rely on Excel to document their business activities. Practitioner G commented on this issue.

Most of them use Excel for their business activities, but Excel is not good enough to produce financial reports. If our clients have problem with QuickBooks, they will come to us. If they ask us for recommendation, we recommend that they use QuickBooks

because most of our staff use QuickBooks, so it is easy to support them. But if they want to use another software, we will learn about the software and make sure that we can support them.

In assisting their clients, the SMPs have made effort to assist and provide training to their clients in relation to technology such as QuickBooks adoption. Their assistance however, is limited to installation and setting up of the technologies and not on the development of the hardware.

The SMPs would advise their clients to obtain the hardware and licence from the software provider. Hence, it is fair to opine that the SMPs do have technical capability in terms of knowledge and skills on technology, which is sufficient to provide services to the SMEs.



Practitioner F noted:

We only provide the installation and setting up service. Clients need to buy the hardware and software. We will ask our IT team to support them in installing the software and providing training programmes. They need to get the QuickBooks license themselves. We only install the software, set up the server and then train them on how to use it.

Similarly, Practitioner G also confirmed on the provision of training on related technology to their clients. As noted by Practitioner G:

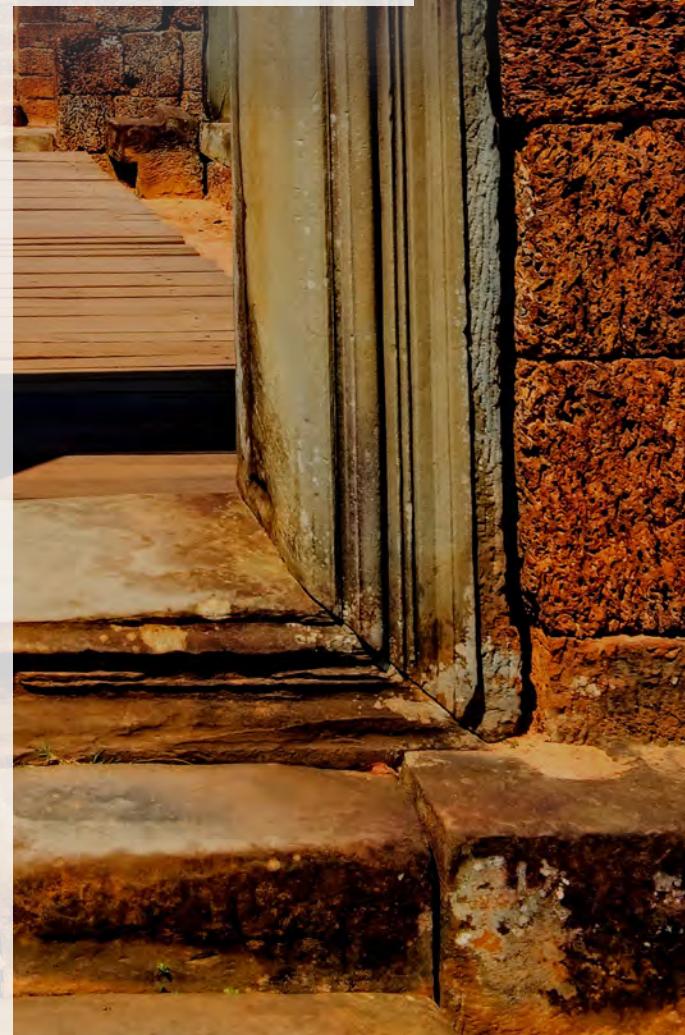
Yes, we do provide training, and we will charge [for the training programmes]. If they call and ask question on how to set up the software, we won't charge them. If our client has problem with QuickBooks, they will come to us.

At first, the SMPs were not aware of the new phenomena in technology, which is Industry 4.0. After obtaining some understanding on Industry 4.0, they believe that Industry 4.0 would indeed have an impact on the accounting profession in the country. Accounting tasks involving data entry, bookkeeping and clerical works would certainly be affected. However, accounting tasks involving analysis and advisory services would not be affected. The SMPs agreed that due to Industry 4.0, firms would no longer need to spend so much on hiring employees to do bookkeeping and clerical tasks, and this advancement would help the staff to perform their deliverables faster and more efficiently. However, there do not see a major issue posed by Industry 4.0 to the accounting profession since there is a shortage of accountants in the country. Practitioner G opined:

Based on my opinion, Industry 4.0 will affect the bookkeeping or clerical jobs, but will not affect critical services, like analysis or advisory. This is beneficial to companies since they do not have to employ many people to perform menial jobs (like bookkeeping and clerical). In Cambodia, we have shortage of accountants and it is difficult to recruit qualified accountants. I think we do still need accountants to make sure the reports produced are correct. Industry 4.0 will not affect staffing because we are already experiencing a shortage.

Practitioner F provided his comment:

I can see that we will gear towards IR 4.0. Why? [This is] because accounting is very systematic. It will be easier for accounting to adopt the technology compared to other industries.



To better serve their clients, the SMPs opined that their clients that are mostly SMEs would not require latest technology since most of their information are kept in hardcopy format or they use common software such as Microsoft Excel and Word. The participants noted that their clients do not adopt sophisticated technologies such as SAP or ORACLE. As noted by Practitioner F:

Our clients do not adopt any sophisticated technology, they just use standard software such as Microsoft Excel and Word. Our clients normally perform accounting jobs using Excel. We are trying to get them [to use accounting software]. They use spreadsheet program for accounting process and they have the Chinese version [of the accounting software] for internal use. [In comparison,] big factories are compliant and willing to spend a lot of money on technology.

They do have few clients adopting accounting software such as QuickBooks Pro. Often, clients will normally refer to SMPs if they have issues relating to the accounting software that they rely on. Practitioner G provided his opinion:

A few clients do not use accounting software, and use only Excel. So, their financial statement is not really reliable because they do not use any software to prepare it. I think all accounting firms' clients use Excel. If our clients have problem with QuickBooks, they will come to us.

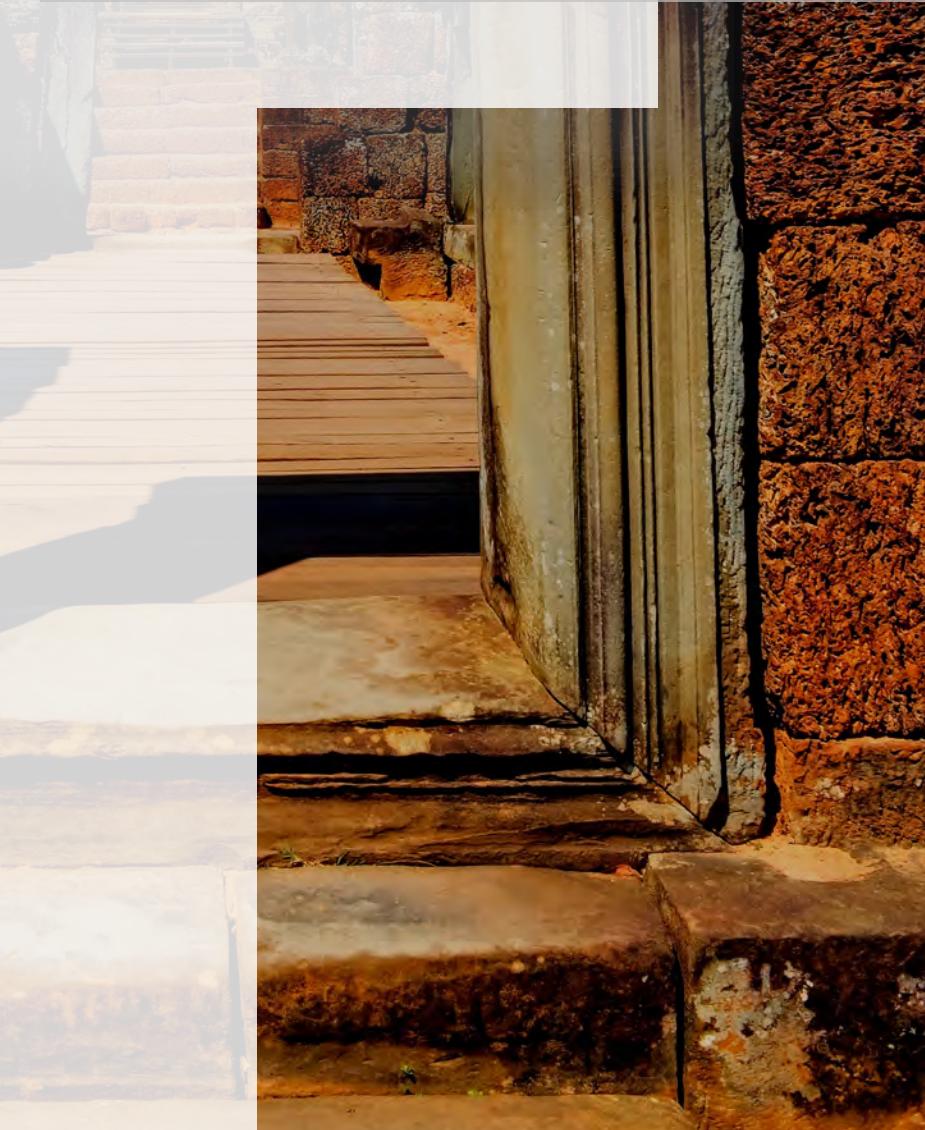
Practitioner F noted:

In Cambodia it is common to use QuickBooks. There are a few clients that come to us and ask us to provide training for them to use their accounting software. We help them to

provide such service. Using QuickBooks, users can select their individual business types – services, manufacturing, etc.

The firms also agreed that the level of technological knowledge among the SMPs, particularly small accounting firms, is considerably low. Another respondent explained that they use QuickBooks but without the payroll module. For payroll, the SMP would rely on other systems such as Microsoft Excel, and record it manually in QuickBooks. Practitioner F commented:

Cambodia SMPs have very low technology adoption. On a scale from 1 (very low) to 5 (very high) for technology adoption, comparing to Big 4, I can say the highest technology competency of SMPs is 3.



Such statement is consistent with opinion of Practitioner G:

On a scale of 1 (very low) to 5 (very high), I think around 3. But now the Ministry in charge would like companies to utilise technology including accounting software and IT software. Companies are forced to use technology, otherwise they (the Ministry) will not help them.

Based on experience, the respondents are also of the opinion that their level of technology knowledge is adequate for servicing their clients. They agreed that there will be a need to increase their technology knowledge based on demand from their clients, but there are some SMPs that adopt such technologies voluntarily and not due to customers demand.

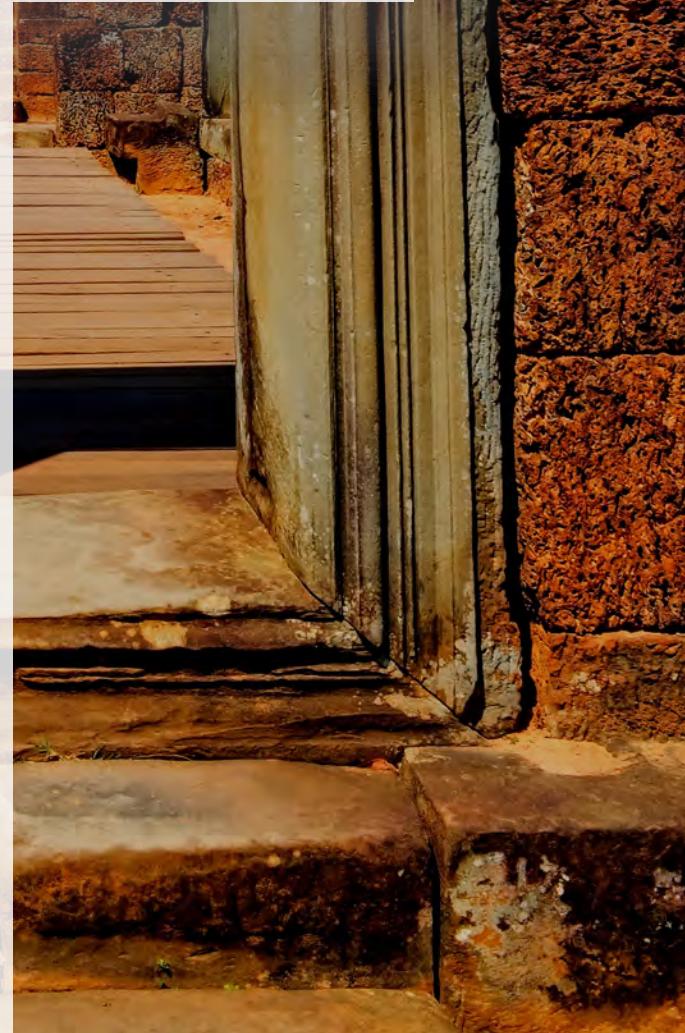
The participants both agreed that it is not a necessity for them to adopt all available technologies. As noted by Practitioner G, his firm use an audit software developed by its affiliated firm:

For general files, we use a software developed by a local firm. But for auditing, we use a special software from Ecovis. Using the audit software, we can customise reports according to what the client wants. But we are not quite familiar with the software. We are still learning and join online training sessions on the software. In February next year, they (Ecovis) will come and visit us to check on everything. I think the audit software we currently use is acceptable if you compare it to [the ones used by the] Big 4.

Firm Innovativeness

Respondents from the SMPs interviewed mentioned that they do have some form of innovativeness with regards to employing technology. Their level of innovativeness depends on the type of transactions and services provided to the clients. The respondents also agreed that the technology used should be customised accordingly, and they would adopt different technology for different purpose. Often, they become innovative by collaborating with other firms.

Such collaboration leads to the adoption of new technology, particularly software related to audit. In addition, the SMPs opined that by doing this, they would be able to expand their network and become sustainable in the long run.



Due to the small economies of scale in Cambodia, this research found that the SMPs do not really address or capitalise the opportunities associated with available technologies. When asked further whether they are interested to take the opportunities to become more innovative in relation to IT, the SMPs responded not in the near future indicating that they have no plan to do so. One of the respondents argued that the initial investment for such technology is way beyond their financial capability and the benefits to be obtained from such investment often do not exceed its cost since most of their clients are small SMEs.

E-Business Practices

Findings from the interview show that the SMPs have their own e-business practices. The SMPs conduct promotional activities on the internet via their websites which contain information including firms' background, contact numbers and type of services provided. One of the SMPs relies on cloud storage rather than using server following recommendations from IT savvy people. As noted by Practitioner G:

We use internet and intranet. Some IT people recommended us to use cloud [storage] rather than server. We are learning the importance of cloud. But IT people say that cloud is much better than server.

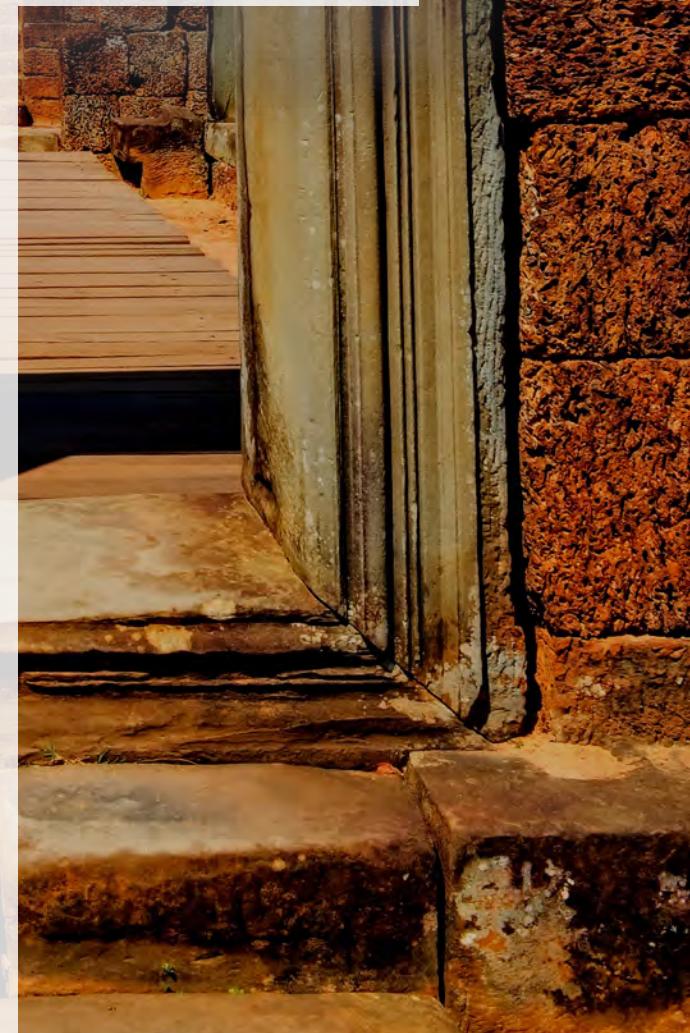
Practitioner G further commented:

Some big companies changed from using Big 4 services to employing us because they feel comfortable working with us. If they have any question, they can ask quickly through e-mail or via phone call. Other firms will impose consultancy charge for such services. Most of our SME clients do not read the contract. Although we only provide bookkeeping services for them, sometimes, they still ask questions

not related to bookkeeping. Some SMPs do not entertain such enquiries because they say it's not part of the contract. But the local companies think differently. They hire us to help them settle their problems. They don't care about our scope; they don't understand that. If they have any question, they will just ask.

This research also found that the SMPs use the internet to communicate with their employees and clients. The use of emails, cloud storage and WhatsApp is common among the SMPs as communication platforms.

They also use these platforms to monitor their staff deliverables. In some cases, due to time and distance constraints, SMPs use Skype to communicate with customers, staff and partners from different branches.



LEADING Factors for SMPs Technological Adoption in Cambodia

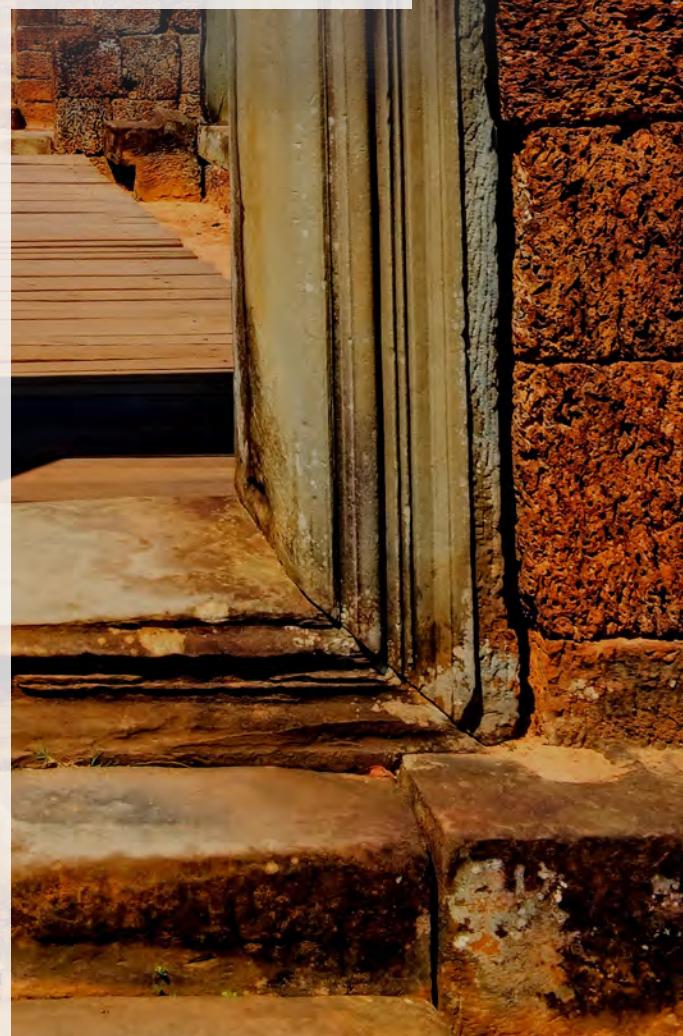
Client Orientation

One eminent finding is that the SMPs tend to follow technologies adopted by the SMEs. This is logical since SMPs provide services to SMEs. The SMPs realise that budget is a concern among the SMEs, leading to delay in adoption of new technologies. Practitioner G noted:

Companies will only invest in technology if they understand its importance. Majority of the companies don't understand [its importance], therefore, they don't spend much on IT. Apart from that, they felt that the technology only complicates their business processes. Some Cambodian tycoons don't use any [accounting] system, and they will sometime reject systems recommended to them. For them, new system means more complications and additional requirements. Most qualified accountants don't want to work with local business owners especially the tycoons. But now, some business tycoons have changed and adopted accounting systems.

The SMEs would rather maintain the existing software unless the Cambodian laws force businesses to adopt the latest technology. Practitioner F opined:

They (SMEs) do not adopt any [accounting] technology. Our clients normally use Excel to do accounting process. We are trying to persuade them to use accounting software, but originating from family business, they don't really care about the issue. Apart from that, there is no law on the matter, so they are not forced to adopt such system. Very small number of my clients adopt ERP.



Assistance and Support from Stakeholders

The SMPs were asked whether they do receive any assistance and support from the government and accounting bodies. They stated that KICPAA need to play a more rigorous role in assisting the SMPs to be more technologically competent so that their business activities can be expanded to other advisory services such as providing IT services to the SMEs. Currently, most of the training courses provided by KICPAA are related to accounting and auditing.

With regards to assistance and support from the government, Practitioner F commented:

At the moment, we did not receive any assistance from the government specifically on IT. The cost of acquiring IT system is expensive. I hope one day there would be some form of assistance from the government so we can invest into IT and train our clients to use the technology.

SMPs Technological Competency Skill in Indonesia

Technology Capability

Interviews were conducted with representatives from SMPs on the current technologies used to operate their businesses and serve their clients. Generally, the SMPs felt that the level of IT utilisation among SMPs is relatively low compared to international audit firms. The situation is not surprising because they are able to provide relevant services to their customers via the latest systems. Like the rest of the developing countries, SMPs in Indonesia are using basic systems and software in providing accounting, auditing and tax services. They use Microsoft Office for reporting and correspondence purposes.

This research also found that the SMPs use specific audit software. The Indonesian Government and IAPI have taken a proactive move in helping to improve SMPs technical capabilities. They have been collaborating to produce an audit software that takes into account the overall audit process, from pre-engagement until audit report preparation. The software known as ATLAS was self-developed by one of the respondents and received good response when it was first introduced, and SMPs in Indonesia are highly recommended to use the software.

However, no specific software is used for tax service other than Microsoft Office. Tax declaration and tax filing are made online using systems and platforms provided by the Inland Revenue Board. In addition, SMPs in Indonesia do not use human resources management software that is typically used

for staff recruitment and training, staff scheduling, time-sheet calculation and other planning and control process related to staff development. Hence, it is fair to opine that the SMPs in Indonesia do have the technical knowledge and skills to a certain extent, sufficient in providing services to their customers which are mostly SMEs.

The SMPs are also aware of IR 4.0 and its implications on accounting profession. New technologies will impact all disciplines, economies and industries by connecting people to the web and drastically improve the efficiency of businesses and organisations (Marr, 2016). The SMPs seems to be prepared to face the implications of IR 4.0. One of the respondents noted that IR 4.0 will have significant impact to all companies including accounting firms. It will increase the companies' efficiency level and reduce paper utilisation. Practitioner H explained:

IR 4.0 will have significant impact to all sectors including accounting and we need to change our operations or audit processes. It will increase companies' efficiencies and reduce paper usage. For us, we prepare ourselves with ATLAS software. With this software, we don't have to go to the client's office because we can perform the audit virtually anywhere. This software will automatically generate documents, for example, bank confirmation. Auditing will still be relevant but the process involved will change significantly.

The SMPs agree that with IR4.0, firms will no longer need to spend much resource on bookkeeping and clerical tasks, but future accounting tasks should gear towards analysis and advisory. They do agree that technology will help firms to perform accounting tasks more efficiently and effectively.

In assisting their clients, the SMPs have made effort to provide training to their clients on latest technology such as ATLAS and AccountTE. The SMPs assist their clients on how to use these software based on the clients' business processes.

The SMPs have a rather consistent view on technology competencies among them. They equip themselves with adequate level of technology competency and capability. However, their level of competencies is still low compared to the Big 4 accounting firms. Most of them still do not offer or employ audit IT services and other advanced services involving technology. The SMPs also do not have internal IT department and do not employ staff experienced in IT audit.

Firm Innovativeness

The interviews revealed that the SMPs are quite innovative in employing technology. This study found that the SMPs used specific software for accounting services (off the shelf software, internally developed software or locally developed software). Practitioner H commented:

Our firm utilise AccountTE, a self-developed accounting software by one of our staff. The software was developed to meet and comply with the financial reporting requirements as outlined in the financial reporting framework announced by IAPI.

The developed software, AccountTE, is able to prepare reports based on accounting standards and it is tailor-made to Indonesian accounting environment. The software is suitable to be used by most business entities because there are several formats or templates that suit the needs of various businesses.

E-Business Practices

From the interviews, the SMPS employ a certain level of e-business practices. The SMPs do have their websites on the internet to promote their businesses. Apart from using servers, they are planning to adopt cloud computing for audit work using a new version of the ATLAS software. With cloud computing, SMPs are able to perform accounting and auditing procedures irrespective of location. Exchanging information and documents between auditors and clients can also be done seamlessly via the cloud.

The SMPs use the internet and WhatsApp to communicate with their employees and clients. They also use these platforms to monitor staff deliverables. In some cases, due to time and distance constraints, some SMPs use video conference platforms to communicate with customers, staff and partners from different branches. Practitioner J commented:

We also use video conference to connect with partners and staff from different branches. For me personally, not all things can be explained through video conference. Sometimes we have to meet face to face to explain things in more detail especially when junior auditors are involved.

E-business platforms will help SMPs to save a significant amount of time, allowing them to spend more time advising clients and do more important tasks.

LEADING

Factors for SMPs Technological Adoption in Indonesia

Client Orientation

SMPs technological competency skills are highly dependent on the technology used by their customers. Most of their clients are SMEs who do not use sophisticated systems. Some SMEs just rely on Microsoft Excel to perform their accounting process. For example, because their clients do not use ERP, thus there is no need for SMPs to offer IT audit services. An interview with one of the audit firm's partner (Practitioner J) revealed that:

We do not use a more advanced system because the current system is sufficient to serve our customers. They don't require us to buy more sophisticated systems. If the customers require such system, we may be able to equip ourselves by purchasing a better system.

On a certain extent, customers depend heavily on SMPs in the preparation of financial statements. What is important for them is that their financial statements can be ready in a timely manner. Apart from the high technology cost and lack of knowledge and interest in IT, customer orientation also greatly influence the decision of SMPs in choosing the most suitable technology for their companies.

Assistance and Support from Stakeholders

The government and accounting bodies also play a key role in ensuring that SMPs can adopt the latest technology. Deployment of such technology requires huge investment. In order to ensure industry competitiveness, these stakeholders need to be aware and willing to help the industry in ensuring they are on the right track in terms of technology usage. The Indonesian accounting bodies – Institute of Indonesian Chartered Accountants (Ikatan Akuntan Indonesia/IAI), Indonesian Institute of Management Accountants (Institut Akuntan Manajemen Indonesia/IAMI) and IAPI have played their roles to promote utilisation of technology in the auditing field including encouraging SMPs to better utilise technology and organising various trainings on accountancy and technology utilisation.

Despite having no special grant for technology advancement, the government and IAPI have made their effort to develop an audit software to facilitate and equip SMPs with technology at affordable cost. The software is practical and appropriate to cater for SMPs needs as it was developed after taking into consideration feedbacks from SMPs. In fact, the software was developed voluntarily by an audit firm partner that is eager to help develop the audit industry in Indonesia.

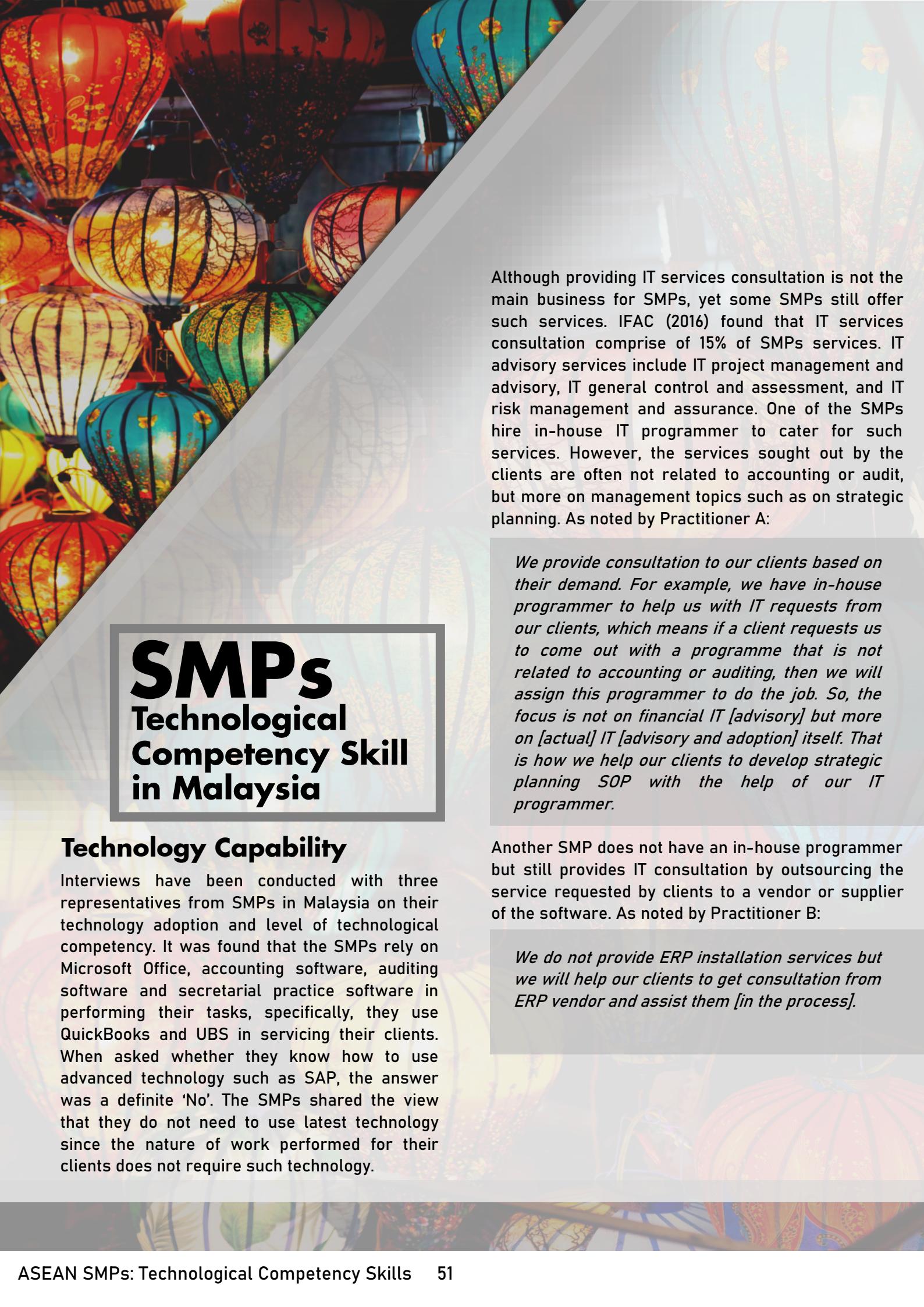
All parties must play their roles to ensure that the community is able to use and benefit from technology. Accounting professional body for example, can provide SMPs with awareness and training programmes. SMPs in Indonesia are fortunate to have a strong support from the government and IAPI in ensuring that SMPs achieve adequate levels of technology. Development of the ATLAS audit software has started a new chapter for SMPs to explore technology further and provide direct benefits for SMPs in exploiting the technology.

Universities on the other hand, could introduce technology and Industry 4.0 in their syllabus, such as introducing audit software and ERP to accounting students. In addition, since Industry 4.0 affects many industries, universities must equip the students by embedding cloud computing and other pillars of Industry 4.0 in their syllabus across disciplines of study. As noted by Practitioner H:

We are collaborating in developing Audit Tool and Linked Archive System (ATLAS) for SMPs in Indonesia. ATLAS is a software programme developed by my firm to computerise the auditing process. This software does all the auditing process starting from planning, auditing, until report preparation. It is developed based on and took into account all auditing standards. Currently, the software is run offline using Excel. But we are developing a new version of ATLAS that can be used as a web-based software.

Practitioner H further explained:

This application is made in collaboration between the Government Employee with Employment Agreement (PPPK) and IAPI to conduct audits. Some SMPs might have budget for technology advancement, but others may not. The government is preparing to come out with website-based ATLAS, so SMPs can utilise the software free of charge and is only required to bear their employees' training cost.



SMPs Technological Competency Skill in Malaysia

Technology Capability

Interviews have been conducted with three representatives from SMPs in Malaysia on their technology adoption and level of technological competency. It was found that the SMPs rely on Microsoft Office, accounting software, auditing software and secretarial practice software in performing their tasks, specifically, they use QuickBooks and UBS in servicing their clients. When asked whether they know how to use advanced technology such as SAP, the answer was a definite 'No'. The SMPs shared the view that they do not need to use latest technology since the nature of work performed for their clients does not require such technology.

Although providing IT services consultation is not the main business for SMPs, yet some SMPs still offer such services. IFAC (2016) found that IT services consultation comprise of 15% of SMPs services. IT advisory services include IT project management and advisory, IT general control and assessment, and IT risk management and assurance. One of the SMPs hire in-house IT programmer to cater for such services. However, the services sought out by the clients are often not related to accounting or audit, but more on management topics such as on strategic planning. As noted by Practitioner A:

We provide consultation to our clients based on their demand. For example, we have in-house programmer to help us with IT requests from our clients, which means if a client requests us to come out with a programme that is not related to accounting or auditing, then we will assign this programmer to do the job. So, the focus is not on financial IT [advisory] but more on [actual] IT [advisory and adoption] itself. That is how we help our clients to develop strategic planning SOP with the help of our IT programmer.

Another SMP does not have an in-house programmer but still provides IT consultation by outsourcing the service requested by clients to a vendor or supplier of the software. As noted by Practitioner B:

We do not provide ERP installation services but we will help our clients to get consultation from ERP vendor and assist them [in the process].



Aside from being well versed with accounting, auditing and secretarial software, the SMPs are also aware of basic knowledge on IR 4.0 such as fintech and big data. They are aware of the technological change that is impacting the accounting as well as the auditing professions. However, the SMPs still think that it may take a while for them to really adopt this new technology. Practitioner C explained:

Our firm is aware of IR 4.0, however, in terms of readiness, I think is not hard to be ready for that. But we are concerned that the clients do not have the required facilities [to adopt IR 4.0]. Although we are IR 4.0 ready, if there is 1% of our clients that are not yet ready, then we still need to cater for their needs [and use the old system].

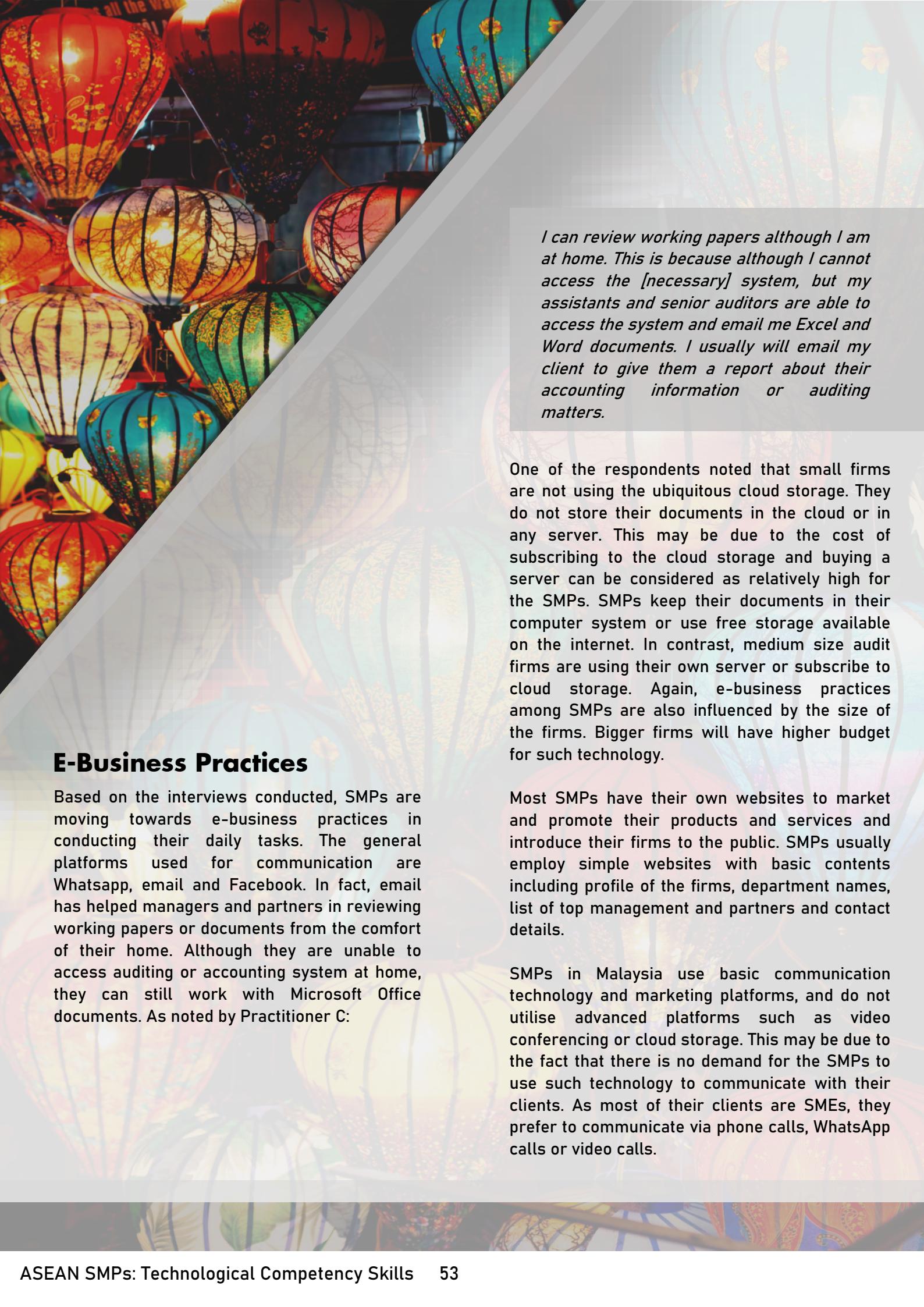
On the other hand, medium size firms have different perspective on IR 4.0. The reason may be due to having better resources and more complicated clients demand compared to small firms. The demands for IT audit and consultation depend on the client's demands. If the SMPs do not have any client from the IT industry, then they are not required to adopt the latest technology.

Firm Innovativeness

Based on the interviews conducted, the SMPs have already adopted IT innovations such as data warehouse integration, service-oriented integration and application server integration. When there is request from their client for a specific software, the SMPs will develop their own software to fulfil the request. SMPs also made efforts in developing their own accounting software, providing IT audit to their clients, establishing internal IT department and providing advanced IT consultancy for their clients. Practitioner A provided the reason:

The main reason why we have an IT department is to develop accounting system to support this company and our client. In developing such system, we can do joint venture with an IT vendor but [we] do not need to do that because we have programmers that are able to develop our own accounting software for GST computation. That is the reason why we choose to develop our own software.

Findings of this research also show that the SMPs' long term financial planning and long evaluation periods of technology audit affect the SMPs decision whether to embrace innovation or not. Decision made by partners in the SMPs plays an important role in deciding whether the firms are ready towards adopting new IT innovations. Despite having constraints in budget, if a partner is well aware of the importance of IT adoption, he/she will ensure the firm will be able to adopt the technology in the near future. The SMPs also noted that other factors such as clients' demand, competitors, regulatory bodies' obligations and other external pressures can influence them to become more innovative.



I can review working papers although I am at home. This is because although I cannot access the [necessary] system, but my assistants and senior auditors are able to access the system and email me Excel and Word documents. I usually will email my client to give them a report about their accounting information or auditing matters.

One of the respondents noted that small firms are not using the ubiquitous cloud storage. They do not store their documents in the cloud or in any server. This may be due to the cost of subscribing to the cloud storage and buying a server can be considered as relatively high for the SMPs. SMPs keep their documents in their computer system or use free storage available on the internet. In contrast, medium size audit firms are using their own server or subscribe to cloud storage. Again, e-business practices among SMPs are also influenced by the size of the firms. Bigger firms will have higher budget for such technology.

Most SMPs have their own websites to market and promote their products and services and introduce their firms to the public. SMPs usually employ simple websites with basic contents including profile of the firms, department names, list of top management and partners and contact details.

SMPs in Malaysia use basic communication technology and marketing platforms, and do not utilise advanced platforms such as video conferencing or cloud storage. This may be due to the fact that there is no demand for the SMPs to use such technology to communicate with their clients. As most of their clients are SMEs, they prefer to communicate via phone calls, WhatsApp calls or video calls.

E-Business Practices

Based on the interviews conducted, SMPs are moving towards e-business practices in conducting their daily tasks. The general platforms used for communication are Whatsapp, email and Facebook. In fact, email has helped managers and partners in reviewing working papers or documents from the comfort of their home. Although they are unable to access auditing or accounting system at home, they can still work with Microsoft Office documents. As noted by Practitioner C:

LEADING

Factors for SMPs Technological Adoption in Malaysia

Client Orientation

SMPs in Malaysia follow the demand and opportunity offered by their clients as this will be the main basis of their profit. If clients request the firm to provide IT consultation, then the firm will provide the expertise either through in-house experts or outsource the service to other third parties. One of the respondents noted that they still do their fieldwork the old school way where invoices are compiled and pre-numbered before they were sent to their clients because most of them do not utilise advanced IT system. In addition, the SMPs also do not provide or develop IT systems for their clients but they do provide IT consultation to the SMEs based on the systems that they need to use. Practitioner C opined:

Most of my clients are construction and trading companies. I can say that those company will not employ advanced IT system in their offices in the near future.

Practitioner B also provided his opinion:

In terms of field work, we are still doing it the old school way. They will compile and pre-number all the invoices manually. Although they use an accounting software, the auditors are not allowed to check the numbers in the system. The auditors are only allowed to audit [the numbers based on] the documents shared by the clients.



Both respondents agreed that client's demand is important in determining the level of technology adoption or consultation services provided by the firms. As noted by Practitioner A:

Demand from SMEs is important in determining IT adoption of the firm. And this does not mean that the firm needs to provide accounting system or audit system. Sometimes we do not provide the systems but instead we provide IT consultation to the SMEs based on the systems that they use.

This is followed by a comment from Practitioner B:

I believe that small firms have their own client base, and some of them are happy with their small client base and do not intend to grow bigger. They do not focus on public interest entities or listed companies because you need to have at least one specific manager to handle such accounts due to its size. Then under the manager, you will require senior auditor and a group of assistants. In contrast, small SMPs only need one manager to handle all audit matters related to the firm.



All SMPs agreed that the Malaysian government is playing its part in providing incentives and tax reduction for SMPs to invest in adopting the latest technology. They stated that their initial intention of adopting the technology was to obtain grant from the government. For example, previously, the Malaysian government provided a grant of RM1,000 for a company to purchase an accounting system. As noted by Practitioner A:

We provide SPS system to clients to get the RM1,000 government grant for the purchase of accounting system. If the price of the system is RM2,000, then clients just need to pay RM1,000. The rest (RM1,000) can be claimed from the government. That is why many clients are interested to purchase the system during that year. So, we took the opportunity to come out with our own accounting system.

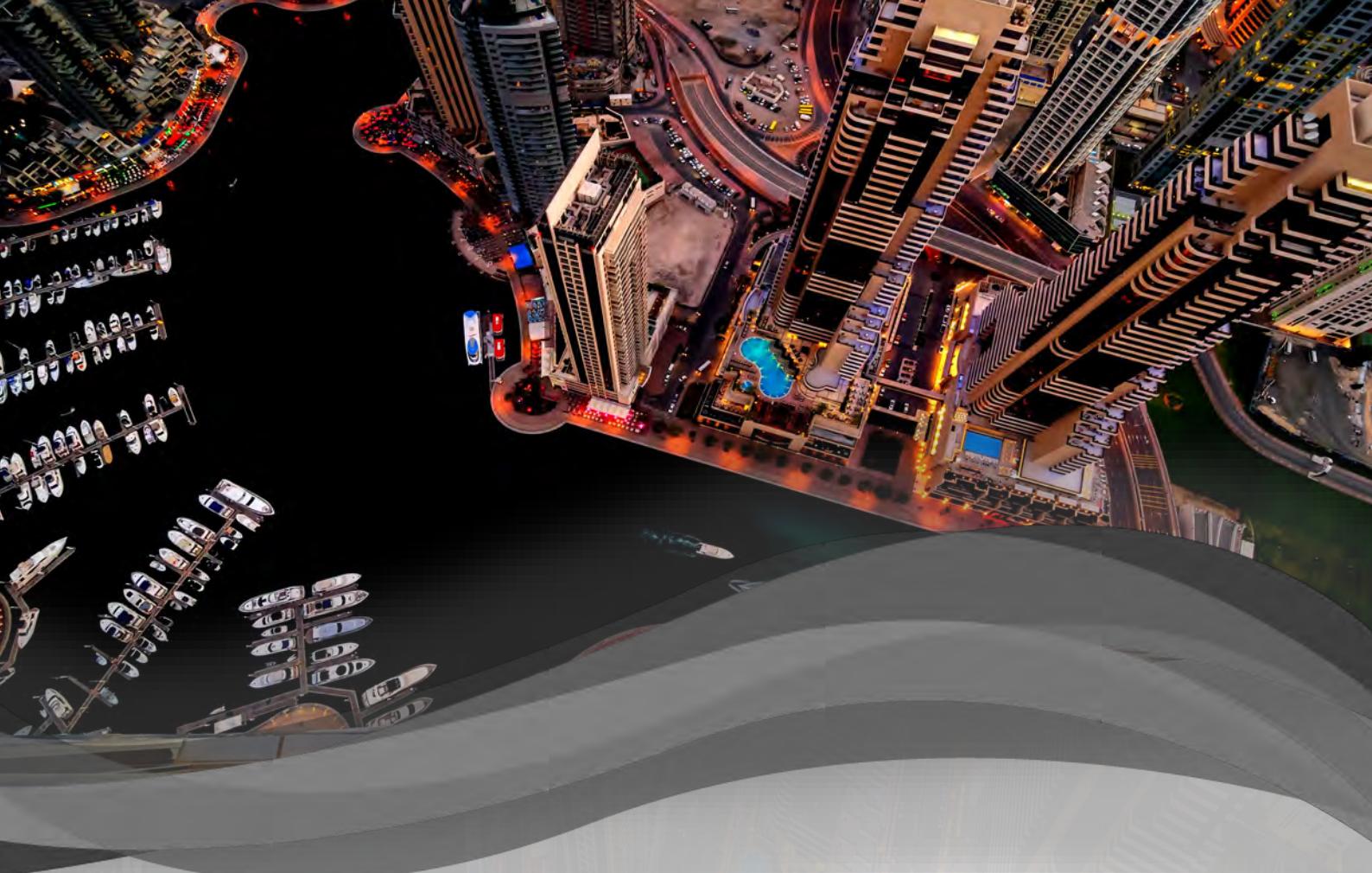
Lack of support from the top management or managing partners in technology adoption is also another determinant as to why the SMPs are not eager to embrace technological change. The main priority for SMPs partners is survival of the firms and not to expand nor gain new technology. Partners have a big influence in providing awareness and guidance for the SMPs to adopt technology. Hence, the way forward for a firm depends on the support from the partners and top management.

Based on the interviews conducted, it can be concluded that for SMPs to sustain and remain relevant in the business, they need to provide IT training to their staff. SMPs also need to create their own IT department and promote IT adoption in order to remain relevant in the industry.

SMPs may not invest and use their resources to adopt the latest technology since most of their SME clients do not require such technology. This might be the main reason why SMPs in Malaysia do not embrace latest technologies compared to other developed countries such as Australia or United States of America.

Assistance and Support from Stakeholders

Technology adoption among SMPs in Malaysia is still at the infant stage and hence, technological competency skills of the SMPs are limited to the technologies used to cater to their clients. A lot of promotions and incentives need to be done by the stakeholders to convince SMPs in adopting the latest technology.



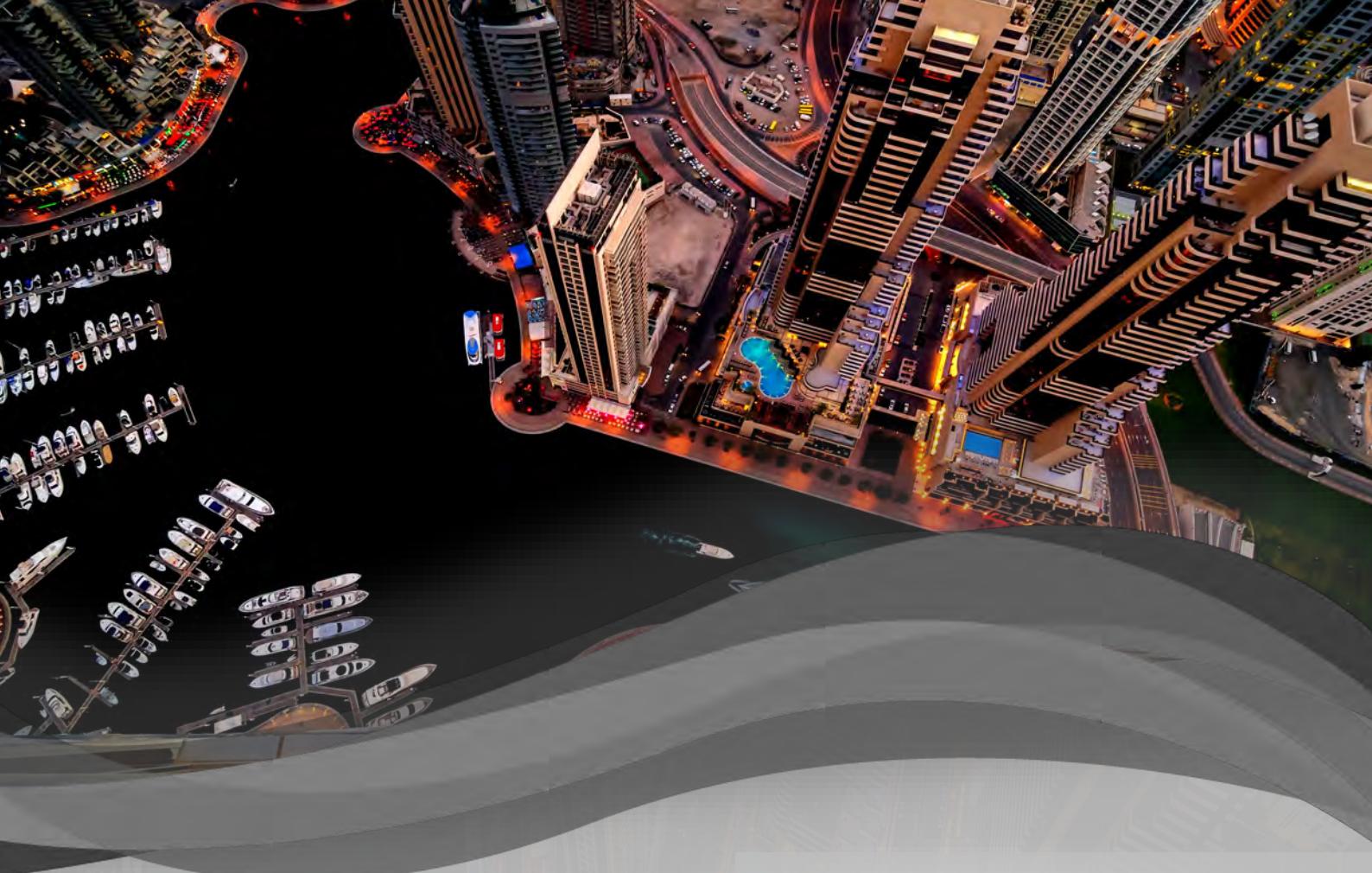
SMPs Technological Competency Skill in Singapore

Technology Capability

Interviews were conducted with two representatives from SMPs on the current technologies used to operate their businesses and serve their clients. It was found that the SMPs agreed that technical ability is paramount in providing relevant services. The SMPs used various technologies such as CAAT, spreadsheets, and audit management software (such as CaseWare, ACL and IDEA for internal audit and Sing Tax for tax purposes). In addition, they also use company secretarial software known as BlueMeg. To ensure that their staff members are competent in handling the software, the SMPs provide training to their staff on how to use new software.

The SMPs are also preparing themselves towards IR 4.0. This is done by ensuring that their current system is future friendly and can be upgraded over time. In fact, their current system has been upgraded several times over the years. They also felt that technology adoption among SMPs in Singapore is above average compared to other neighbouring countries, although according to them, the current technology adoption is still at its early stage and thus the impact is too early to predict. Practitioner E opined:

Maybe, in the future, in 7 to 10 years, there will be more things like continuous auditing. Of course [in] accounting profession, there is a lot of technology like cloud accounting and Optical Character Recognition (OCR). Maybe in the future we don't have to do double entry anymore, we just scan and straight away data is entered into the system.



However, when asked about AI, they noted that they know and are aware of AI's ability to improve overall process, but they do not believe in investing in the technology now, because they think that they should invest on maximising the ability of their clerks to multitask. Practitioner E opined:

There is technology and automation. For example, customers can just take photos of their receipts and they can be auto-classified, but we don't believe in artificial intelligence for the industry yet. [To improve the company], we spent our money to maximise the ability of our clerks to handle more work.

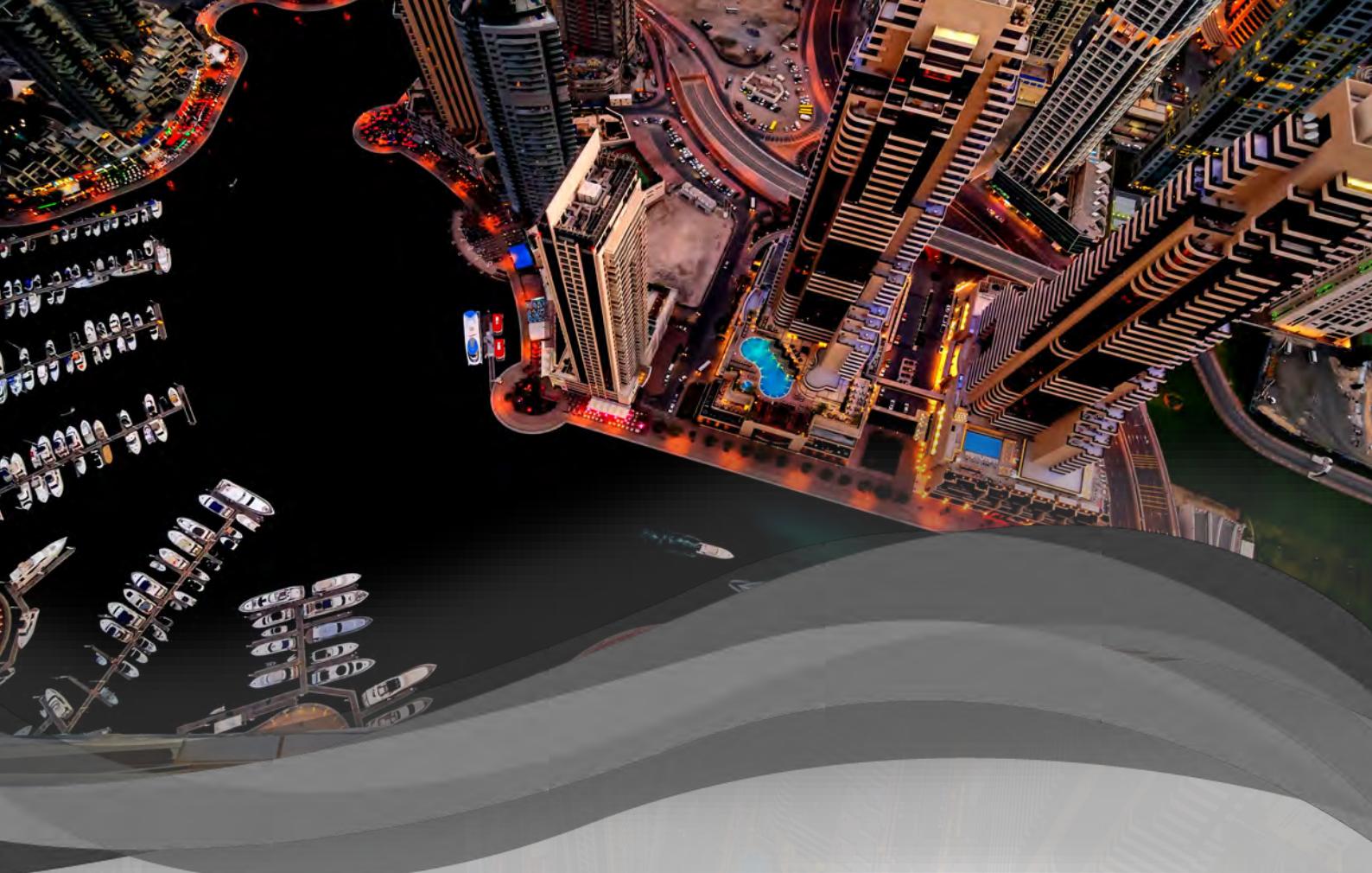
Firm Innovativeness

From the interviews, it was found that the SMPs believe in having firm innovativeness in employing technology such as application server integration which they consider as an asset to improve their performance. The SMPs also use their own software and integrate with other accounting software such as QuickBooks and ZOHO, depending on their clients' request. Practitioner D responded:

The current system we adopt is future friendly, we purposely want to use a platform that can be upgraded over time. This is not our first time upgrading the software, it's our third time in four years and basically, we have a future proof software all this while.

One of the respondents noted that the firm has spent a significant amount of money into IT investment. They have adopted ERP which is used as ZOHO creator. The ZOHO CRM platform is used to customise and build their own application. They have also used several accounting software including ZOHO Books and QuickBooks, as well as human resources software. In addition, the SMPs also use ZOHO and CRM for sales and customer management. Practitioner D noted:

Our company is employing the latest technology because the bosses come from the big 4 background, and one of them is from IT. We employ all kinds of technology - we also built our own ERP system and [use it to] provide service to around 4,000 customers. Good thing in Singapore is that our government will help us with the cost of internet. We use ZOHO Books to build our own ERP system. Everything is done online. [Currently] we are building a Company Secretary System...



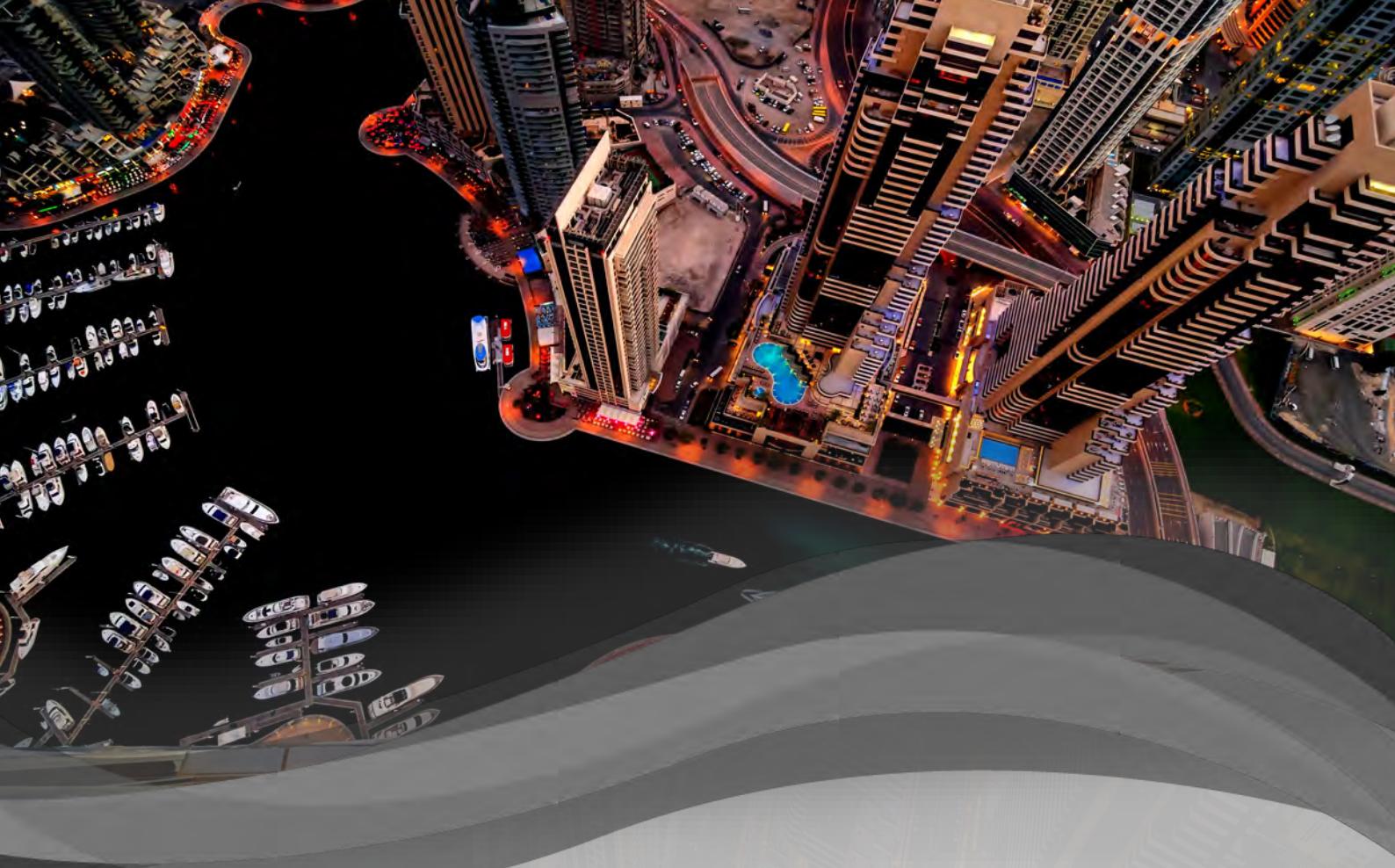
E-Business Practices

From the interviews, the SMPS also employ e-business practices. The SMPs noted that their firms are quite advanced in practising e-business in terms of using mobile phones, broadband, cloud computing and internet of things (IoT). They also provide integration system services such as point-to-point integration and business-to-business (B2B) integration. One of the respondents noted that e-business practices allow them to cater to younger clients who are tech savvy. Practitioner D explained:

We are familiar with mobile broadband, IoT and cloud (services). We need this to ensure that we are connected to our clients. Clients also prefer to communicate using WhatsApp.

Efforts have been made to store the SMPS' data on the cloud. In addition, they are willing to collaborate with other accounting firms in sharing their e-business practices. They have also created websites for the firms to promote and reach out to their existing and potential clients, particularly to the younger generations. Practitioner D explained:

Younger clients adopt the latest technology, [for example] cloud software. However, others just want their jobs done with least cost. And they expect technology will make their jobs easier, which most of the time is the case. Most importantly [technology could] increase productivity, so we can handle more customers with limited resources...



LEADING

Factors for SMPs Technological Adoption in Singapore

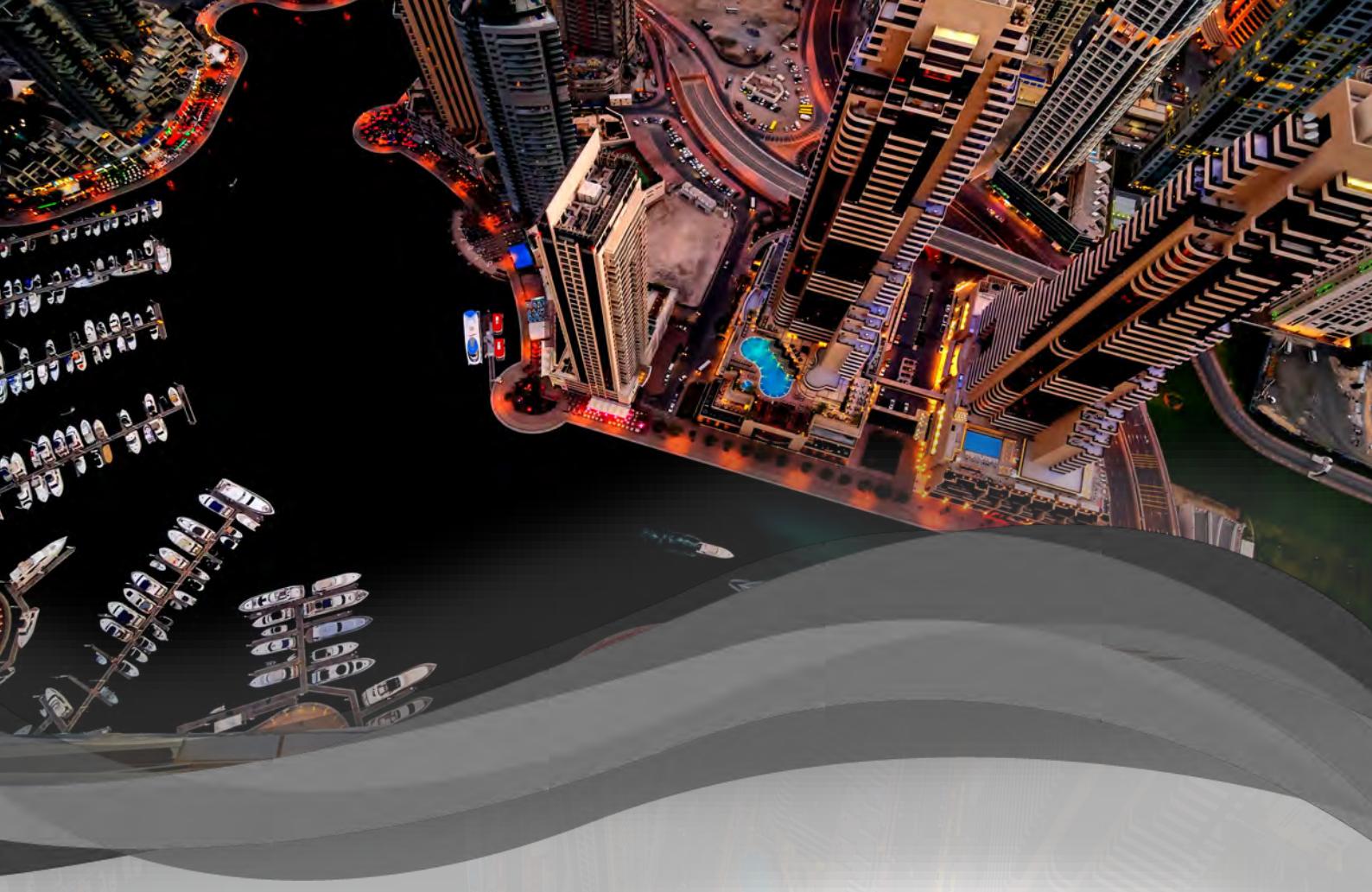
Client Orientation

Discussion with the SMPs revealed that they do provide technology services to clients or customers. The SMPs noted that often only younger clients would adopt latest technology such as cloud software. Practitioner D commented:

Younger clients adopt the latest technology, [for example] cloud software, while others just want their jobs done with the least cost.

However, a majority of their clients are from the older generations. The SMPs noted that these clients are not ready to adopt latest technology as they would often just want to get their jobs done with the least cost. Therefore, the SMPs would only use technologies that can cater to their clients. Practitioner E provided his comment:

Some of the clients are not ready for such technology. But they must, nonetheless be able to track the trends of what [is] happening, in case you need to adopt it. Of course more SMEs are adopting technologies [like] cloud accounting, point of sales, and online auditing system. Whether or not SMEs adopt ERP depends on how big their organisation is, because ERP [is] also linked to inventory management. Some of them may not want to use sophisticated ERP accounting, but we have clients who are already using ERP.



Assistance and Support from Stakeholders

Based on the interviews, the SMPs noted that assistance and support from stakeholders is necessary to encourage them to adopt a technology. The cost of investing in technology is high which can be overwhelming for them. Due to the financial and investment constraint, the government is helping the SMPs by providing dedicated voucher schemes. As noted by Practitioner D:

For us, Singapore's Innovation and Capability Voucher scheme, with vouchers valued at SGD5,000, allows the SMPs to strengthen our core business operations in terms of innovation, productivity, human resources and financial management. With the initiatives and assistance by the government, the SMPs are optimistic in their investment on technology.

Practitioner E agreed with Practitioner D's statement. He noted that:

Smaller accounting firms will get a SGD2.4 million boost to go digital as part of a road map unveiled yesterday to spur growth in the sector (The Straits Time, 2018). The road map aimed to create 2,000 new jobs by 2020, while helping accounting firms adopt new technologies and expand abroad. It also targeted annual growth of 5.6% for the sector to reach SGD2.03 billion in value-add by 2020. A key initiative is the new Digital Transformation for Accountancy programme, which will give small and medium-sized practices funding support of up to SGD30,000 each to adopt technology solutions.

The decision to invest in technology can also be attributed to the top management's background. One of the respondents stated that their directors who have IT background has voted for the firm to invest in IT as they realised its importance in order to become more competitive and sustain strategic IT advantages.



SMPs Technological Competency Skill in Thailand

Technology Capability

Based on the interviews conducted with two representatives from SMPs, they have the expertise in using accounting software, audit software, tax software and human resource software. The accounting software programmes used are such as Auto Flight, Express and UBS. Most of the SMPs do not use advanced accounting software such as ERP due to its high cost, lack of expertise to use the system and lack of support from the government to adopt such technology. Practitioner K opined:

For small and medium practices, we don't use sophisticated software like in big firms. We only use basic accounting software like Auto Flight, Express, and All-in-one. We have accounting software but no audit software.

Most often, the SMPs in Thailand are using audit software such as CCH. However, there is a problem in using CCH to perform audit work. The software uses English as its mediator language whereas the audit firms are using Thai language for their working papers. Hence, it is troublesome for the staff to translate everything

to English before uploading the information into the CCH system. This has created a barrier for the SMPs to adopt this software in performing their audit work.

SMPs in Thailand do provide advisory services on ISO certification. The SMPs need to have certain technical IT knowledge in order to provide this service. However, they can also hire another organisation to be in-charge of the IT matters. As noted by Practitioner L:

Technical capability is not the main problem in implementing IT services in the country because the companies here have the technical capability required to implement such services. There are differences between auditing and IT security services based on countries. Here, audit firms and accounting firms do not have to comply with ISO requirements as there are many other regulations for the firms to comply with including human resources and environmental regulations.

Firm Innovativeness

The SMPs also do not produce their own localised accounting or auditing software, instead, they use software that suit their clients' needs and come with reasonable price tag. This is because there is no incentive from the government in promoting IT usage among the SMPs.



For accounting services, the SMPs use a software programme that is considered very helpful in recording the accounting information of their clients. As there is no locally developed software, the SMPs engaged a programmer to develop a simple software programme similar to Microsoft Excel which is very easy to use and taught to the client. Practitioner K opined:

The company may not have very advanced technology but we do use software. Even during IR 4.0, the auditor job is still secured and required to some extent. There will be further development in the software in the future.

Apart from accounting and auditing software, the SMPs also developed software for management purposes such as planning and scheduling audit work process from client acceptance until audit field work. Electronic timesheet is an online scheduling system used by the SMPs to manage audit planning and work performed by auditors. This system is available for audit staff to access from the SMP firm's website. This timesheet is an innovation by the SMP to ease the burden of their audit staff from manually writing their timesheet schedule for the managers and partners to review.

One of the respondents informed that they do provide simple IT advisory services free of charge, for example software purchase suggestion. He noted that although they provided their suggestions to clients, the clients are free to choose their own software based on their preferences. Practitioner K noted that:

We suggest to our clients the most suitable accounting software and the customers themselves will choose the best software that fits them. We provide IT advisory but we don't charge [for such service] because we only provide customers with suggestions. Our clients do not invest much on software.

In general, most SMPs in Thailand do not provide IT advisory function. In performing audit work, sometimes the auditor is required to assess the general IT control or internal IT control of the company. Hence, advice from IT expert or consultant will be required. The IT expert or consultant is not an auditor but someone who has their own IT business. Big audit firms do provide such IT audit service as their clients are mostly listed companies that are involved in various online transactions. As noted by Practitioner L:

Not many SMP firms provide this kind of services because mostly will focus on audit and bookkeeping only.

E-Business Practices

Based on the interviews conducted, the SMPs are using the internet and extranet for their daily work and to connect with clients. In fact, one of the respondents highlighted that their firm is using electronic timesheet to monitor the auditors work scheduling.



Besides that, the SMPs use websites to further promote their companies. Information such as company profile, location and contact number are included in the websites for easy access by the clients and general public.

In terms of communication with clients, SMPs in Thailand use email, WhatsApp, Telegram and WeChat as the main communication means. These social media are convenient and efficient in sharing information and communicating with their clients.

In addition, one of the respondents is using video conferencing as a platform to communicate with their stakeholders. Practitioner K provided his opinion:

We have computers, we use video conference services, we also utilise high speed internet, smartphones, and internet servers.

Since most of the working papers are in the softcopy form, therefore data storage is an important matter for the SMPs. One of the respondents highlighted that their company is using their own server and cloud storage to store their working papers and client's data. Hence, the SMPs in Thailand are using all the latest e-business practice in performing their daily work.

LEADING Factors for SMPs Technological Adoption in Thailand

Client Orientation

The SMPs agreed that the demand for technology adoption and competency depends on the need and demand of their clients. If the client is a listed company, then there is a tendency for the SMPs to use accounting and auditing software when doing the audit. However, for small firms, most of their clients are still using traditional audit method. Most of the audit evidences such as invoices, payment vouchers and other accounting documentations are in hardcopy form. Usually clients will send in their files of invoices and vouchers to the SMPs for the auditors to perform their job.

For SMPs, the costs incurred are not a problem as long as information technology can fulfil their needs, and SMPs must be familiar with the software used by their clients too. Practitioner K noted:

For small accounting firms, most of their customers are also small SMEs. These companies may not have very advanced technology but their main service is [providing] tax services. SMEs require such services because they are obliged to pay tax and submit tax file to the government.



The SMPs agreed that client's demand is important in determining the technology adoption or consultation provided by the firms. Therefore, we can conclude that in Thailand, size and resources of the clients have a significant role in determining technology adoption of the SMPs.

Demand from clients is a crucial matter in determining IT innovation for SMPs. SMPs in Thailand are only allowed by the government to audit non-public listed companies. These SMPs do not need advanced software for their accounting and audit services, therefore, they are not keen to invest heavily in IT technology. The SMPs are more concerned on the company's survival rather than spending money on new technology and innovation.

Assistance and Support from Stakeholders

Support from stakeholders such as TFAC and government plays an important role in determining the success of technology adoption in Thailand. TFAC should create awareness among the SMPs on the latest trend and technology in the accounting community. Training in technology, digital applications and software are important for accountants and auditors from SMP firms for them to gain knowledge and expertise in providing IT advisory in the digital era. Auditors can no longer only depends on IT experts on technology related matters but they need to at least know the latest applications and software related to accounting and auditing. Besides TFAC, the government of Thailand can promote technology adoption

through incentives and rebates for purchase of software, provision of training courses, assistance on conference fees and allocation of financial support for small firms to adopt technology. These initiatives can definitely persuade more SMPs to adopt the latest technology. However, currently, there is no incentive from the government in promoting the use of IT. As noted by Practitioner L:

I think auditors need government support [in IT related matters] because IT system is very expensive. Apart from that, as accountants/auditors, we don't know much about IT. It is best if we could hire an internal IT consultant, but what if we don't have the resources to do so? Thus, I think the government should assist this industry.

Key Challenges

for ASEAN SMPs in Adopting Technology

"In its journey to become the fourth largest world economy by 2030, the Association of Southeast Asian Nations (ASEAN) plans to have a younger population, a rising middle class and a rapid adoption of technology (Loong, 2018). In addition, the rise of mobile technologies usage and high internet penetration in the region has resulted to the increase in latest technology adoption, improving the digital economy growth by 6.4 times from USD31 billion in 2015 to USD197 billion by 2025 (Economic Research Institute for ASEAN and East Asia, 2019)."'

This research found that the key challenges experienced by ASEAN SMPs in technology adoption include:

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Technology is expensive and time consuming

SMPs have the same capacity as SMEs and thus, have limited financial resources to invest on technology. Several SMPs are concerned about the cost of adopting technology. They also perceive learning as time consuming and requires a lot of resources.

Mismatch in technology between SMPs and SMEs

Although some SMPs may use high end technology for their business operation, their clients may not adopt the same level of technology. A percentage of their clients may still use the traditional physical filing system.

Inadequate regulatory policy and support

There is no unified policy and regulation on SMPs' technology utilisation, thus the firms are not forced to adopt any standard or system. They are free to use any system that is compatible with their business process and clients demand.

IT workforce shortage and poor IT skills

Lack of analytical and IT skills among the SMPs hinders the process of integrating the latest technology into their daily operation and process. This circumstance is made worse due to the lack of IT personnel in the company. Findings in this study show that a large number of SMPs are not ready to enter this agile environment despite having new, "user-friendly" technology – they require a lot of IT training to tackle this issue.

Integration with legacy system

The findings show that most SMPs prefer to practise current business processes instead of adopting new technology. They choose to maintain the current process to minimise disruption and limit the need for additional training to integrate new technology into their current system. Lack in facility and infrastructure also contribute to their readiness level.

4

Age variance factor

5

A wave of new generation being employed in the SMPs creates situational pressure due to different knowledge and IT skills between the new and old generations. The new generation is usually more acceptable to new technology while the older generation tends to prefer traditional method and usually are not interested to learn and adopt new technology. Getting everyone on board to embrace a new technology will become a major concern since most of the accountants in SMPs seek comfort in the familiar.

Lack of motivation to adopt technology

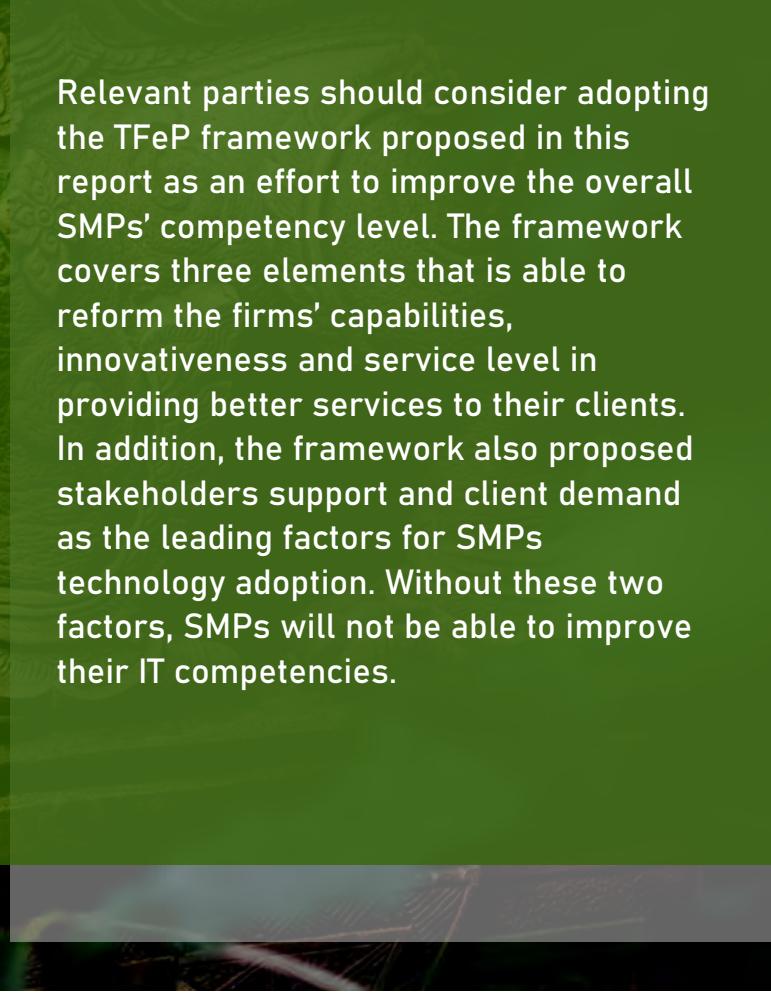
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SMPs are not required to incorporate latest technology in performing their daily operations of preparing financial statements for their customers. There is no motivating factor for them to adopt advanced technology into their operation.

6



PART 6 PROPOSED ASEAN SMPs TECHNOLOGICAL COMPETENCY SKILLS FRAMEWORK



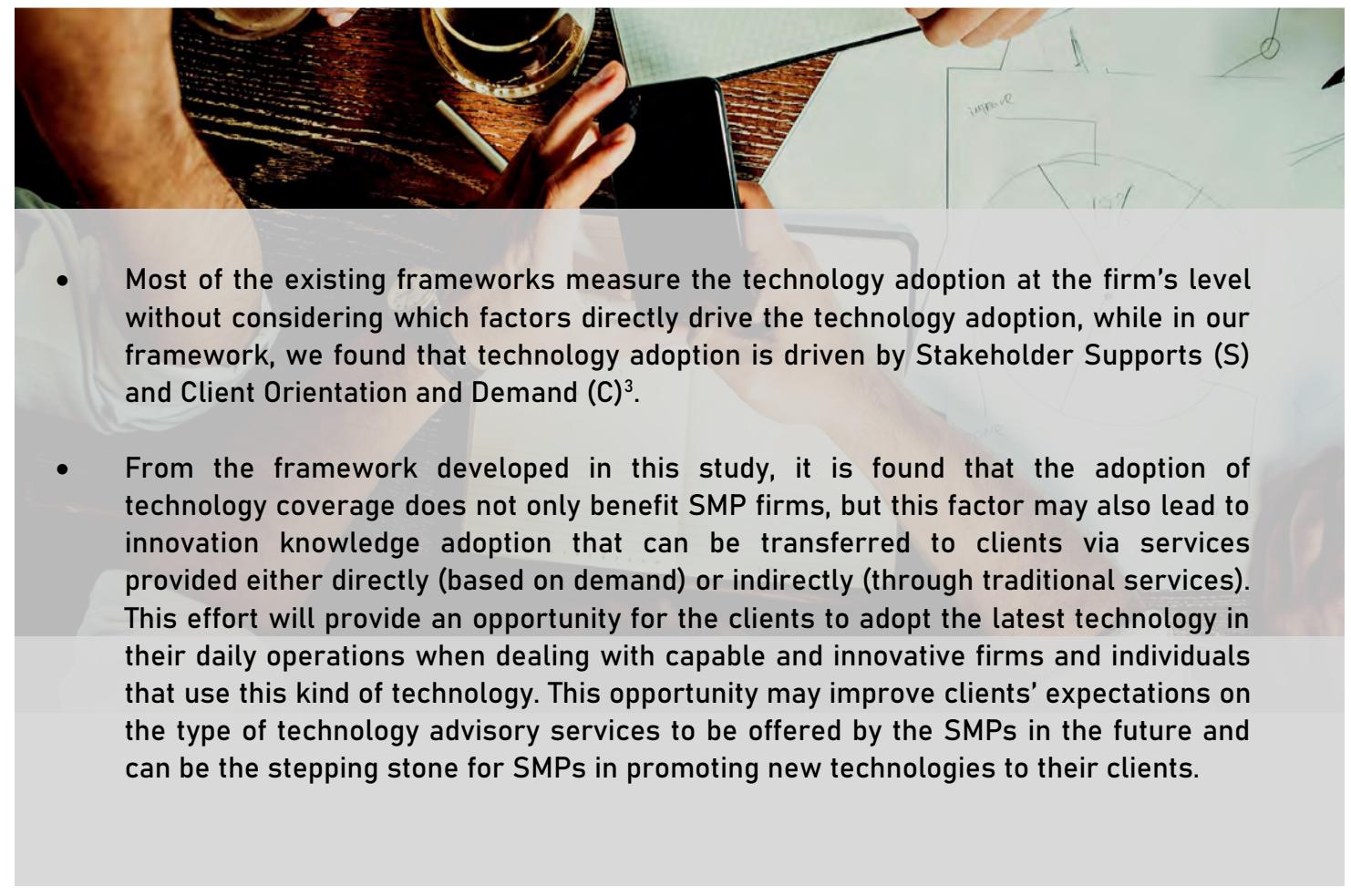
Relevant parties should consider adopting the TFeP framework proposed in this report as an effort to improve the overall SMPs' competency level. The framework covers three elements that is able to reform the firms' capabilities, innovativeness and service level in providing better services to their clients. In addition, the framework also proposed stakeholders support and client demand as the leading factors for SMPs technology adoption. Without these two factors, SMPs will not be able to improve their IT competencies.



- The TFeP framework in **Figure 15** is a comprehensive framework on technology adoption that can be used to examine and improve ASEAN SMPs technological competency skills from both firm and individual levels.
- The framework illustrates how Stakeholder Supports (S) and Client Orientation and Demand (C) as the leading factors¹ for technology adoption can influence the main determinants of SMPs skills namely Technology Capability (TC), Firm Innovativeness (FI) and E-Business Practices (eP)². The implementation of TFeP at firm level will indirectly influence future technological competency skills at individual level. It is important for a firm to identify their employees' current competency level for them to provide the necessary training programs to improve their workers' technology competencies in order to cater for current and future clients' expectations.
- This research contributes to the existing technology adoption framework by adding two new leading factors (Stakeholder Supports (S) and Client Orientation and Demand (C)) that may drive technology adoption process while incorporating other perspectives in order to examine whether the effect of its adoption would be appropriate and compatible with existing related accounting and advisory practices and technology competency skills.

¹The factors that contribute to technology adoption were adopted from Sulaiman et al. (2010). The proposed TFeP framework refines Sulaiman et al.'s model to make it clearer by focusing on other perspectives which are external forces, firm and individual levels, and client impact.

²For example, Sulaiman et al. (2010) suggested that technology capability (TC), Firm Innovativeness (FI) and E-Business Practices (eP) have an impact on technology adoption, while Rosli et al. (2013) investigated technology adoption based on Technology-Organisation-Environment (TOE).



- Most of the existing frameworks measure the technology adoption at the firm's level without considering which factors directly drive the technology adoption, while in our framework, we found that technology adoption is driven by Stakeholder Supports (S) and Client Orientation and Demand (C)³.
- From the framework developed in this study, it is found that the adoption of technology coverage does not only benefit SMP firms, but this factor may also lead to innovation knowledge adoption that can be transferred to clients via services provided either directly (based on demand) or indirectly (through traditional services). This effort will provide an opportunity for the clients to adopt the latest technology in their daily operations when dealing with capable and innovative firms and individuals that use this kind of technology. This opportunity may improve clients' expectations on the type of technology advisory services to be offered by the SMPs in the future and can be the stepping stone for SMPs in promoting new technologies to their clients.

³The framework identifies that the three factors proposed by Sulaiman et al. (2010) required the extension of support from stakeholders as well as client orientation and demand as the leading factors that will drive technology adoption at the firm level. Without considering these two leading elements, the objective of technology adoption at the firm level will not be achieved because client supports (financial and non-financial supports, policy interference and specific client demands) are the main drivers of technology adoption in SMPs.

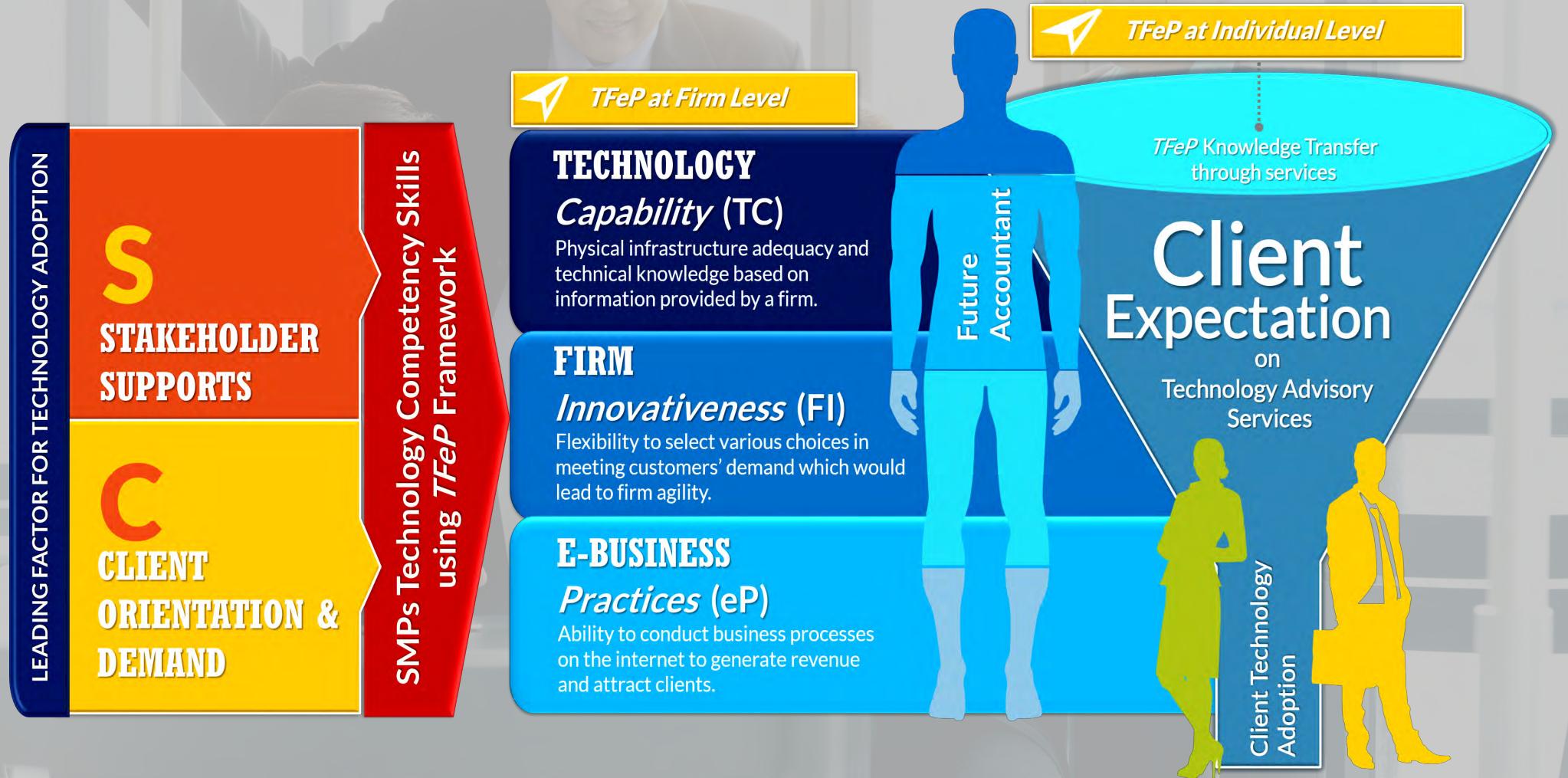


Figure 15: ASEAN-APTCs: Proposed ASEAN accounting professional technological competencies skills using TFeP framework



PART 7 CONCLUSION AND MOVING FORWARD

Government's role is critical in technology adoption. Usually, SMEs do not have the capability to invest in the latest technology due to cost constraints. Support from the government (in terms of grants, financing, laws, and policies) is required in embracing such initiative.

If technology is made mandatory, there won't be the issue of technology mismatch between SMEs, SMPs, and other stakeholders, thus improving the entire economic ecosystem of the country.



Conclusion

This report presented the findings on ASEAN SMPs' technology adoption and technology competency skills in five countries namely Cambodia, Indonesia, Malaysia, Singapore, and Thailand.

This study successfully demonstrated the SMPs' current level of technology competency according to three themes namely technology capability, firm innovativeness and e-business practices based on the framework developed by Sulaiman et al. (2010).

This research found that the main factors influencing technological adoption among ASEAN SMPs are stakeholders support and client orientation and demand.



Key Contributions

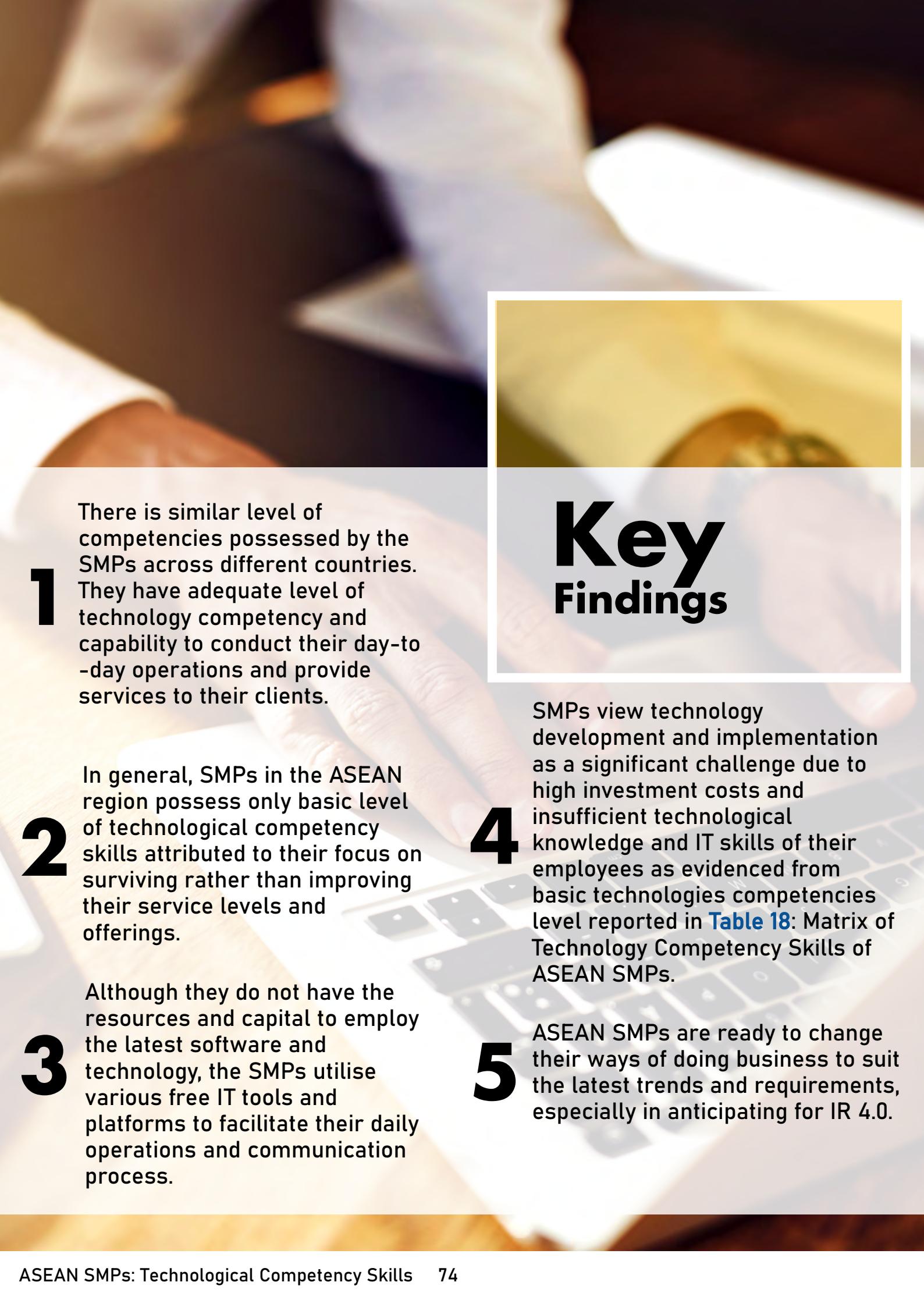
1 **Definition:** There is no common definition for ASEAN SMPs. To work around this issue, definitions of SMPs in the five countries are obtained to derive to a common definition of SMPs for the ASEAN context. This new definition can be used as a benchmark for future studies.

2 **Framework:** There is no existing framework to determine a region's level of technological competency skills. This research introduced an approach to assess this matter by developing a new framework based on findings from an existing study.

3 **Regional SMPs technological skills:** There is no data on regional SMPs level of technological competency skills. Using the developed framework, this research successfully determined the current ASEAN SMPs' level of technological competency skills.

4 **Improvement framework:** There is no framework on ways to improve SMPs technological competency skills. This research proposed a novel framework on means to improve SMPs skills and services to better serve their customers.

5 **Challenges:** This research provided better understanding on challenges faced by SMPs. Stakeholders (accounting bodies and governments) should develop better initiatives to tackle the issues and assist SMPs in the region.



1 There is similar level of competencies possessed by the SMPs across different countries. They have adequate level of technology competency and capability to conduct their day-to-day operations and provide services to their clients.

2 In general, SMPs in the ASEAN region possess only basic level of technological competency skills attributed to their focus on surviving rather than improving their service levels and offerings.

3 Although they do not have the resources and capital to employ the latest software and technology, the SMPs utilise various free IT tools and platforms to facilitate their daily operations and communication process.

Key Findings

4 SMPs view technology development and implementation as a significant challenge due to high investment costs and insufficient technological knowledge and IT skills of their employees as evidenced from basic technologies competencies level reported in **Table 18: Matrix of Technology Competency Skills of ASEAN SMPs.**

5 ASEAN SMPs are ready to change their ways of doing business to suit the latest trends and requirements, especially in anticipating for IR 4.0.

Moving Forward

We suggest that several initiatives be undertaken by relevant parties (such as Government, professional accountancy organisation, related institutions etc.) to assist the SMPs:

Relevant parties should consider adopting the TFeP framework proposed in this report as an effort to improve the overall SMPs' competency level. The framework covers three elements that are able to reform the firms' capabilities, innovativeness and service level in providing better services to their clients.

In addition, the framework also proposed stakeholders' support and clients' demand as the leading factors for SMPs technology adoption. Without these two factors, SMPs will not be able to improve their IT competencies.

2

Related stakeholders could assist the SMPs by focusing on areas that need improvements. For example, in Indonesia, IAPI have made their effort to develop an audit software to facilitate and equip the SMPs with technology at affordable cost. The software is practical and appropriate to cater for SMPs needs as it is developed after taking into consideration feedbacks from SMPs.

Other ASEAN accounting bodies can follow suit and develop similar software. The development of such software has greatly improved SMPs technological utilisation and provides the firms with a system to improve their daily operations.

Moving Forward

3

It is crucial to improve SMPs personnel's skills and capabilities. Thus, relevant authorities can focus on providing training programmes in order to improve and develop SMPs technological skills.

Online / recorded training programmes should be offered to provide inexpensive training sessions to improve accountants' and auditors' skills and capabilities. CPD points should be provided from such training programmes.

4

On-going training programmes on advisory and consultancy services that aim to train the SMPs to embark on high level consultancy should be seriously considered. This is imperative as the accountants' provision of services in the future is expected to change due to changes in the overall business process as well as IR 4.0 factor. New environment requires new and improved human capabilities in terms of technological, commercial and management aspects.

5

Awareness programmes should be conducted on the importance of using technology to improve auditing and accounting processes. For example, in Malaysia, we found that there are audit firms that have started to use artificial intelligence in their daily work flow. Such awareness programmes are imperative to increase the SMPs' level of technological readiness and improve their overall service offerings.



Moving Forward

6

The government's role is critical in technology adoption. Usually, SMEs do not have the capability to invest in the latest technology due to cost constraints. Support from the government (in terms of grants, financing, laws, and policies) is required in embracing such initiative. If technology is made mandatory, there won't be the issue of technology mismatch between SMEs, SMPs, and other stakeholders, thus improving the entire economic ecosystem of the country.

7

Most importantly, SMPs themselves need to prepare their firms and employees to embrace the latest IT developments, especially IR4.0. They need to be aware of the gadgets and systems that can improve their overall efficiency, reduce costs, improve work quality, and facilitate overall business dealings. This will become the firms' competitive advantage over their rivals to ensure their survival in the cruel business world.

Moving Forward

8

The effects of COVID-19 pandemic are felt around the world and carry a significant impact on technology adoption among ASEAN SMPs. The disruption can accelerate the acceptance of remote working policies and rapid focus on evaluating and de-risking the end-to-end value chain. SMPs with remote working technologies are already seeing increased demand for their services as businesses increase their remote working capabilities.

Demand for cloud infrastructure services and specialised software will increase due to the increase in remote working culture among the SMPs. Cloud storage allows data to be accessed anywhere and anytime from any device, encouraging employees to work

from home and elevating their technology competency skills. To cater for this new norm, SMPs need to improve the speed and reliability of their internet connection, hence, support from the Government is relevant during this challenging time to accelerate the adoption of relevant technologies for the SMPs.

COVID-19 pandemic will permanently change ASEAN SMPs mindset and acceptance on technology adoption in a short period of time. Future research can consider the impacts of COVID-19 pandemic on technology adoption and digital transformation to identify and compare the change in competencies level.



APPENDICES

On-going training programs on advisory and consultancy services that aim to train the SMPs to embark on high level consultancy should be seriously considered. This is imperative as the accountants' provision of services in the future is expected to change due to changes in the overall business process as well as IR 4.0 factor.

New environment requires new and improved human capabilities in terms of technological, commercial and management aspects.

APPENDIX 1

Prior Literature

Definition of Technology Competency

Several studies have provided the definition of technology competency from the accounting perspective. Initially, technology competency refers to the ability of accountants to use specific software packages (Bean & Medewitz, 1987). Over the decades, there is a change in this definition as accountants are expected to be aware of accounting information systems, management information systems, expert systems, computer science and mathematical programming, among others (Ghani & Mohammad, 2019). On the other hand, a study argued that accountants should know how to transfer files, upload and download data, use local area networks, perform electronic commerce and utilize the World Wide Web (Chen, Damtew, Banatte and Mapp, 2009).

Other studies defined accountants technology competency to include spreadsheets, database management systems, telecommunications, accounting systems, systems development and other information technology topics (Carnaghan, 2004). IFAC noted that technology is important for the accounting profession (IFAC, 2003), and accountants are required to be users, assurance providers and evaluators, as well as managers and designers of an information system (IFAC, 2014). Hence, technology competency can be viewed as the technological knowledge and skills possessed by accountants in providing better service quality to their clients (Ku Bahador & Haider, 2012).

Concept of Technology Competency

Many studies have examined the concept of technology competency, however, it seems that there is no standard instrument on how to measure technology competency (Thuraisamy, Mohamad, Omar & Marimuthu, 2009). Several research suggested that different measures should be used to assess technology competency concept as different firms have different levels of technological adoption.

A study argued that smaller firms often have less resources compared to larger firms which deter them to invest in technology (Kula and Tatoglu, 2003). In addition, sector types also influence technology adoption, for example, technologies suitable for the construction sector may not necessarily be suitable for professional service sector. The reason is because different sectors face different opportunities and challenges (Sulaiman et al., 2010). Professional services firms such as the SMPs need to adhere to regulations and standards imposed by various professional bodies such as the Kampuchea Institute of Certified Public Accountants and Auditors (KICPAA). In addition, emergence of new technologies brought new challenges and opportunities, thus defining how accountants perform their tasks (Che Abdul Rahman, Tengku Abdullah, Agus & Rahmat, 2011).

APPENDIX 1

Prior Literature

Categories of Technology Competency

A research classified technology competency into four categories namely, programming, software, hardware and networking and communication (Bean and Medewitz, 1987). Another study stated that there are two main components of technology competency namely technology related knowledge and technology related experience, where technology related knowledge means specific knowledge that an individual has while technology related experience means technical knowledge that someone obtained from his previous interaction with technology (Basselier, Benbasat and Reich, 2003). Tippins and Sohi (2003) came out with similar categories namely technology knowledge, technology operation and technology object. However, all these studies only examined technology competency from an individual perspective. From organisational perspective such as SMPs, Sulaiman et al. (2010) in their study on professional services firms categorized technology competency into three main components which are technical capability, firm innovativeness and e-business practices.

Technical Capability

Technical capability refers to the firms' physical infrastructure and technical knowledge. Firms can increase their technical capability, thus enhancing their advantages by acquiring new technology (Sulaiman et al., 2010). Usually, technical capability cannot be acquired easily as it takes time and varies across sectors. For example, technical capability in manufacturing sector includes production engineering and manufacture of capital goods (Eckaus, 1991), while for professional services sector, such capability includes technical support and quality of service. Technical capability can assist firms in growing faster and increase their market share and business performance. A study found that accountants have low level of advanced technology knowledge such as Artificial Intelligence and Electronic Data Interchange although they are proficient in general computer and professional accounting skills (Damasiotis et al., 2015). However, the use of technology and perceived importance of technology may vary among accountants. It is expected that the same scenario holds true for SMPs.

APPENDIX 1

Prior Literature

Firm Innovativeness

One of the pathways for firms to obtain competitive advantage is through innovation (Tajeddini, Trueman, & Larsen, 2006). Innovation has become an important factor due to volatility and uncertainty in the business environment (Skerlavaj, Song, & Lee, 2010). Innovation offers firms the flexibility to select various choices in meeting customers' demand which would lead to improved firm agility. Innovativeness describes the tendency and ability of the firms in introducing innovations (Lumpkin & Dess, 1996; Hult, Hurley, & Knight, 2004). Additionally, Tsai and Yang (2013) suggested that firm innovativeness is likely to encourage its members to be creative and experiment with novel ideas and products. Firm innovativeness is often measured at product and organisation levels, encouraging employees to support unique business ideas, perform research and develop new products or services (Dibrell, Fairclough, & Davis, 2015). Innovation focuses on the ways for a firm to become competitive by searching for opportunities, performing strategic planning and conducting R&D (Lin & Chen, 2007).

E-Business Practice

E-business practice means conducting business processes via the internet. It is a platform that allows firms to adapt to the needs of customers and reduce costs (Watson, Leyland, Berthon & Zinkham, 2002). E-business also allows faster expansion from local market to global market – allowing firms to alleviate their capacity constraints, capitalize on emerging market opportunities and serve as a catalyst for transformation (Volery & Lord, 2000). It provides business opportunities to new audiences, transforms current business approach and delivery, and alters the competitive landscape. E-business processes include buying and selling goods and services, servicing customers, processing payments, managing production, collaborating with business partners, and sharing information. SMPs can grab this opportunity to establish an online presence for their business. SMPs are also encouraged to adopt the current technology, trend and be innovative in running their business.

APPENDIX 2

Research Methodology

This study involved several phases of data collection which focuses on ASEAN SMPs. To develop our research methodology, this study relied on few sources:

Phase 1: Interviews and Desktop Research

Phase one of this study involved interviews with large companies, collecting documents and performing analysis. The interviews were conducted to describe and identify current technologies adopted by large companies especially related to financial services. Next, publicly available documents were collected from SMPs websites and relevant accounting bodies. These documents include:

- 1) Business nature, number of employment opportunities created and contributions of SMEs and SMPs in the five ASEAN countries namely, Malaysia, Singapore, Cambodia, Indonesia and Thailand.
- 2) Definitions of SMPs based on legal and institutional frameworks in the five ASEAN countries, if available.
- 3) Statistics of SMPs in the five ASEAN countries.

Phase 2: Institutional Surveys

Phase two involved an institutional survey with the aim to collect relevant documents related to the SMPs. This study approached AFA and professional accounting bodies in the five ASEAN countries, namely Malaysian Institute of Accountants (MIA), Indonesia Institute of Certified Public Accountants (IAPI), Institute of Singapore Chartered Accountants (ISCA), Thailand Federation of Accounting Professions (TFAC) and Kampuchea Institute of Certified Public Accountants and Auditors (KICPAA). Majority of the professional accounting bodies welcomed this initiative and provided assistance to complete the study.

Phase 3: Questionnaire

Phase three involved a questionnaire involving the SMPs. The aim of this survey is to identify the characteristics of technologies adopted by the SMPs. This section also requested the SMPs to identify their main types of client as well as types of services provided to their clients. The questionnaire was prepared in three languages namely Indonesian, Thai and English.

The SMPs were approached via email and also through the assistance of AFA and accounting bodies of the respective countries. Despite aiming for 500 respondents for this survey, this study received 222 responses, and this amount is considered appropriate for analytical purposes. From this number, 111 questionnaires were collected through physical copies while the remaining 111 were collected through online survey via Google Form. [Table 19](#) shows the respondents' country of origin.

APPENDIX 2

Research Methodology

Table 19: Respondents' country of origin

Respondents' Country	%
Indonesia	48.6
Singapore	6.3
Malaysia	30.6
Thailand	7.2
Cambodia	7.2

Phase 4: In-depth Interviews

Phase four involved interviews with professional accounting bodies and SMPs from the five countries to represent the case studies for this project. The aim of this phase is to get an in-depth understanding on the SMPs' accounting technological competency skills as well as obtaining an understanding on the clients' demand of services from the SMPs. In addition, this phase also allowed the researchers to obtain an understanding on the challenges faced by the SMPs. **Table 20** shows that in total, 11 SMPs have been interviewed.

Table 20: Interviewed SMPs

Country	SMPs	N
Malaysia	A	3
	B	
	C	
Singapore	D	2
	E	
Cambodia	F	2
	G	
Indonesia	H	2
	I	
Thailand	J	2
	K	

APPENDIX 3

Limitations

This research provides a comprehensive quantitative and qualitative study in examining SMPs technology competency skills in providing services to the SMEs. The SMPs technological competency skills depend highly on their technological adoption which is determined by clients' needs and demands, and support from stakeholders in matters including technology development and implementation. This study is subject to several limitations:

- 1) Participants for in this study are limited to professional accountants registered with professional accountancy organisations only, this limits the total number of eligible participants, and consequently, rate of responses to the questionnaire. Fortunately, the number of questionnaire responses obtained for this study is sufficient to achieve the study's objectives.
- 2) The quantitative method used in this study is limited to descriptive statistics analysis. Detailed correlation or regression analysis was not able to be conducted due to time limitation.
- 3) Participants in the qualitative case study are limited to a maximum of three participants for each country. The findings are considered sufficient as the total interviews done are relatively similar in all five countries.
- 4) Language barrier is another limitation in this study. Due to different geographical locations involved, some of the information gathered needs to be translated to English, resulting to some delay in completing the report.
- 5) This research started in September 2019 – a busy period for auditing and accounting firms to complete annual financial audit and producing quarterly financial reports. This issue affected the process of getting questionnaire responses from the auditors and accountants because they have a lot of workloads and do not have much time to spare in completing the survey.
- 6) The research report only covers five selected countries in ASEAN (Malaysia, Singapore, Thailand, Indonesia and Cambodia) and does not cover the entire ASEAN region. Therefore, the results obtained does not reflect and comprehensively validate the ASEAN technology adoption and professional accountancy technological competency skills. This limitation is due to the strict timeline given for the study and researchers' inability to cover the remaining six countries.

APPENDIX 4

Steps to Determine ASEAN SMPs Definition

To come up with a definition for ASEAN SMPs, this study followed these steps:

Step 1

Search for general definitions of SMEs and SMPs. The purpose of this step is obtain an understanding on the characteristics and criteria of SMEs and SMPs.

Step 2

Identify definitions of SMPs provided by professional accounting bodies, as well as factors defining them. This study found that IFAC (2010, p.1) Small and Medium Practices (SMP) Committee provided a definition on SMPs as:

Practices that exhibit the following characteristics: its clients are mostly small-and medium-sized entities (SMEs); it uses external sources to supplement limited in-house technical resources; and it employs a limited number of professional staff. The SMEs that SMPs serve include not only small businesses, but also public sector organisations, such as small government agencies and not-for-profits. SMPs typically offer a broad range of professional services that help their clients both comply with regulation and enhance their business performance.

These services range from traditional accountancy-based services, such as audit, other assurance, accounting, and tax, to various forms of value-adding business advisory services, including advice on strategic planning, financial management, financing, and risk management.

Step 3

Determine whether there is an actual definition for ASEAN SMPs. Based on the literature and professional bodies' reports, this study could not find a definition for ASEAN SMPs.

APPENDIX 4

Steps to Determine ASEAN SMPs Definition

Step 4

Examine the definitions of SMPs in the five ASEAN countries based on interviews conducted in this study. The purpose is to identify the similarities and differences on the criteria in defining SMPs in these countries. This study showed that the definitions of SMPs in the ASEAN region vary due to the different laws governing the respective countries.

The SMPs in the ASEAN countries are generally defined based on several categories such as number of employees, total assets and total sales turnover/revenue and customer types. However, not all countries adopted the same metrics.

Figure 16 presents the steps taken in this study to come up with a definition for ASEAN SMPs .

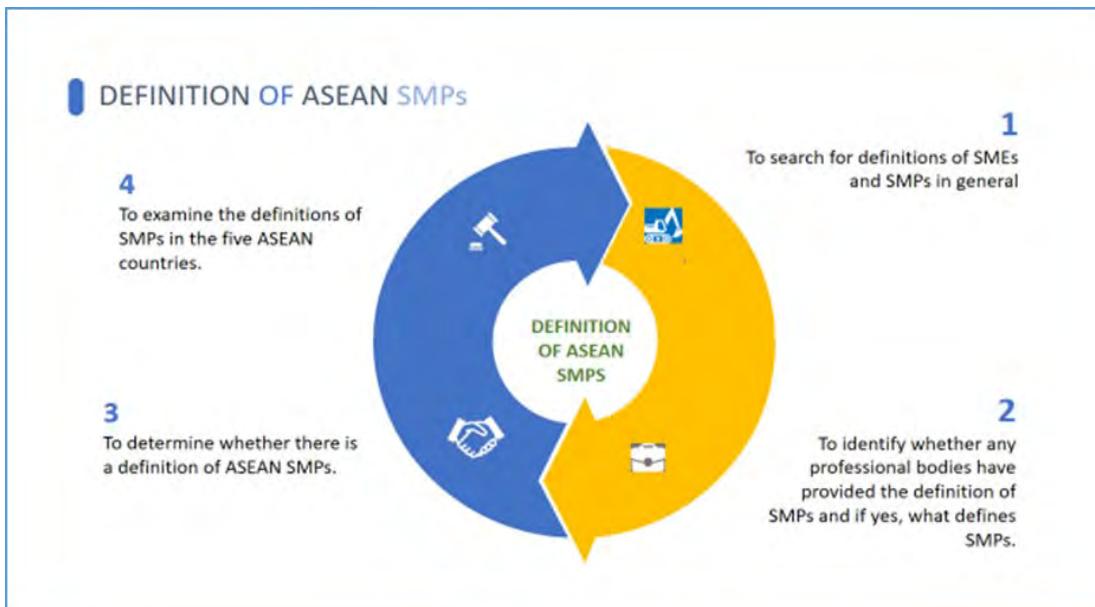


Figure 16: Steps taken to obtain definition of ASEAN SMPs

APPENDIX 5

Software and Systems Identified

No.	Technologies
1	Computer / Laptop / Notebook
2	Office Productivity Tools (e.g. MS Office, MS Outlook, MS Excel, MS Access)
3	Accounting Software (e.g. UBS, SQL, Xero)
4	Accounting & Financial Management Software (e.g. UBS, SQL, QuickBooks)
5	Server
6	Time Cost Management Software (e.g. Superior Time cost & e-timesheet)
7	Audit Management Software (e.g. Audit Express – AXP, CCH)
8	Tax Software (e.g. iBizzTax)
9	Company Secretarial Software (e.g. COSEC, XBRL)
10	IT Audit Services
11	IT Governance and IT Risk Assessment
12	Human Resources Software
13	Planning and Scheduling (e.g. Project Management Software)
14	Generalised Audit Software (e.g. ACL, Arbutus, IDEA, EAS)
15	Specialised / Customised Audit Software (written by the auditors)
16	IT Internal Audit
17	Analytics Tools / Visualisation
18	Business Process Modelling
19	Business Process Management
20	VMware Fusion
21	VMware Workstation
22	Data Governance
23	Governance, Risk and Compliance
24	IoT (Data Sensor)
25	Robotic Process Automation
26	Enterprise Resource Planning (e.g. SAP, Oracle)
27	Analytic & Reporting Software
28	Machine Intelligence and Artificial Intelligence
29	Visualisation Tools (e.g. Tableau, Qlikview, Qlik Sense, PowerBI)
30	Statistical Package (e.g. SAS)
31	IT Tax Investigation and Tax Audit
32	IT General Control (ITGC) Assessment

APPENDIX 5

Software and Systems Identified

33	IT Project Management and Advisory
34	IT Risk Management and Assurance
35	E-Learning Applications
36	Database-to-Database Integration (e.g. Pervasive Integration Architect, Data Mirror's Castellar Hub, SAP solution)
37	Enterprise Application Integration (EAI) (e.g. SAP solution, Oracle, IBM, Web Methods)
38	Business-to-Business (B2B) Integration (e.g. Electronic data interchange (EDI), Extensible Mark-up Language (XML))
39	Automated Control Testing
40	Penetration Testing
41	Cybersecurity Preparedness Review
42	ISO 27001:2005 Gap Analysis and Mapping
43	Disaster Recovery and Business Continuity Planning
44	System Security and Hardening Assessments
45	Digital Audit
46	Extensible Business Reporting Language (XBRL) Adoption
47	Voice Mail
48	Presentation Software
49	Social Media (Presentation Software)
50	Sales & Customer Management
51	Vulnerability Assessment
52	Personal Data Protection
53	Data Visualization (e.g. graphs, image, tables)
54	Enterprise Content Management
55	Business Intelligence (e.g. Crystal Report, Business Objects)
56	Data Warehouse Integration: (e.g. Logistics Integrated Database (LIDB), SAP solution, Oracle)
57	Application Server Integration: (e.g. Oracle application server, Siebel's Java Data Beans, SAP's JCA (J2EE Connector Architecture))
58	IT Sourcing / Outsourcing
59	Certified Information System Auditor (CISA)
60	Qualified Security Assessor (QSA)
61	Certified Information System Security Professional (CISSP)

APPENDIX 5

Software and Systems Identified

62	Service Oriented Architecture (SOA)
63	Service Oriented Integration (SOI)
64	Simple Object Access Protocol (SOAP)
65	Software Development and Customisation
66	E-mail
67	High Speed Internet
68	Official Company Website
69	Smartphones or Tablets (On-The-Go Gadgets)
70	Internet Service (Fixed or Mobile Broadband)
71	Discussion and Chat Technologies (e.g. Messaging, Video Conferencing)
72	Web Services
73	Website Design and Development
74	Cloud Computing
75	Chatbot (Cloud Messaging)
76	Blockchain
77	Point-to-Point Integration (e.g. IBM MQ Series, WebSphere)
78	Java API for Web Services

APPENDIX 6

Technology Identified

Technical Capability

No	Technologies
1	Computer / Laptop / Notebook
2	Office Productivity Tools (e.g. MS Office, MS Outlook, MS Excel, MS Access)
3	Accounting Software (e.g. UBS, SQL, Xero)
4	Accounting & Financial Management Software (e.g. UBS, SQL, QuickBooks)
5	Server
6	Time Cost Management Software (e.g. Superior Time cost & e-timesheet)
7	Audit Management Software (e.g. Audit Express – AXP, CCH)
8	Tax Software (e.g. iBizzTax)
9	Company Secretarial Software (e.g. COSEC, XBRL)
10	IT Audit Services
11	IT Governance and IT Risk Assessment
12	Human Resources Software
13	Planning and Scheduling (e.g. Project Management Software)
14	Generalised Audit Software (e.g. ACL, Arbutus, IDEA, EAS)
15	Specialised / Customised Audit Software (written by the auditors)
16	IT Internal Audit
17	Analytics Tools / Visualisation
18	Business Process Modelling
19	Business Process Management
20	VMware Fusion
21	VMware Workstation
22	Data Governance
23	Governance, Risk and Compliance
24	IoT (Data Sensor)
25	Robotic Process Automation
26	Enterprise Resource Planning (e.g. SAP, Oracle)
27	Analytic & Reporting Software
28	Machine Intelligence and Artificial Intelligence
29	Visualisation Tools (e.g. Tableau, Qlikview, Qlik Sense, PowerBI)
30	Statistical Package (e.g. SAS)
31	IT Tax Investigation and Tax Audit
32	IT General Control (ITGC) Assessment

APPENDIX 6

Technology Identified

33	IT Project Management and Advisory
34	IT Risk Management and Assurance
35	E-Learning Applications
36	Database-to-Database Integration (e.g. Pervasive Integration Architect, Data Mirror's Castellar Hub, SAP solution)
37	Enterprise Application Integration (EAI) (e.g. SAP solution, Oracle, IBM, Web Methods)
38	Business-to-Business (B2B) Integration (e.g. Electronic data interchange (EDI), Extensible Mark-up Language (XML))
39	Automated Control Testing
40	Penetration Testing
41	Cybersecurity Preparedness Review
42	ISO 27001:2005 Gap Analysis and Mapping
43	Disaster Recovery and Business Continuity Planning
44	System Security and Hardening Assessments
45	Digital Audit
46	Extensible Business Reporting Language (XBRL) Adoption

Firm Innovativeness

No	Technologies
47	Voice Mail
48	Presentation Software
49	Social Media (Presentation Software)
50	Sales & Customer Management
51	Vulnerability Assessment
52	Personal Data Protection
53	Data Visualization (e.g. graphs, image, tables)
54	Enterprise Content Management
55	Business Intelligence (e.g. Crystal Report, Business Objects)
56	Data Warehouse Integration (e.g. Logistics Integrated Database (LIDB), SAP solution, Oracle)
57	Application Server Integration (e.g. Oracle application server, Siebel's Java Data Beans, SAP's JCA (J2EE Connector Architecture))
58	IT Sourcing / Outsourcing
59	Certified Information System Auditor (CISA)

APPENDIX 6

Technology Identified

60	Qualified Security Assessor (QSA)
61	Certified Information System Security Professional (CISSP)
62	Service Oriented Architecture (SOA)
63	Service Oriented Integration (SOI)
64	Simple Object Access Protocol (SOAP)
65	Software Development and Customisation

E-Business Practices

No	Technologies
66	E-mail
67	High Speed Internet
68	Official Company Website
69	Smartphones or Tablets (On-The-Go Gadgets)
70	Internet Service (Fixed or Mobile Broadband)
71	Discussion and Chat Technologies (e.g. Messaging, Video Conferencing)
72	Web Services
73	Website Design and Development
74	Cloud Computing
75	Chatbot (Cloud Messaging)
76	Blockchain
77	Point-to-Point Integration (e.g. IBM MQ Series, WebSphere)
78	Java API for Web Services

APPENDIX 7

Assessment of SMPs Level of Technological Competency Skills

No	Technologies	Theme of Technology Competency	Category or Level of Competency
1	Computer / Laptop / Notebook	Technical Capability	Basic
2	Office Productivity Tools (e.g. MS Office, MS Outlook, MS Excel, MS Access)	Technical Capability	Basic
3	Accounting Software (e.g. UBS, SQL, Xero)	Technical Capability	Basic
4	Accounting & Financial Management Software (e.g. UBS, SQL, QuickBooks)	Technical Capability	Basic
5	Server	Technical Capability	Basic
6	Time Cost Management Software (e.g. Superior Time cost & e-timesheet)	Technical Capability	Intermediate
7	Audit Management Software (e.g. Audit Express – AXP, CCH)	Technical Capability	Intermediate
8	Tax Software (e.g. iBizzTax)	Technical Capability	Intermediate
9	Company Secretarial Software (e.g. COSEC, XBRL Related Software)	Technical Capability	Intermediate
10	IT Audit Services	Technical Capability	Intermediate
11	IT Governance and IT Risk Assessment	Technical Capability	Intermediate
12	Human Resources Software	Technical Capability	Intermediate
13	Planning and Scheduling (e.g. Project Management Software)	Technical Capability	Intermediate
14	Generalised Audit Software (e.g. ACL, Arbutus, IDEA, EAS)	Technical Capability	Intermediate
15	Specialised / Customised Audit Software (written by the auditors)	Technical Capability	Intermediate
16	IT Internal Audit	Technical Capability	Intermediate
17	Analytics Tools / Visualisation	Technical Capability	Advanced
18	Business Process Modelling	Technical Capability	Advanced
19	Business Process Management	Technical Capability	Advanced
20	VMware Fusion	Technical Capability	Advanced
21	VMware Workstation	Technical Capability	Advanced
22	Data Governance	Technical Capability	Advanced
23	Governance, Risk and Compliance	Technical Capability	Advanced
24	IoT (Data Sensor)	Technical Capability	Advanced
25	Robotic Process Automation	Technical Capability	Advanced

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26	Enterprise Resource Planning (e.g. SAP, Oracle)	Technical Capability	Advanced
27	Analytic & Reporting Software	Technical Capability	Advanced
28	Machine Intelligence and Artificial Intelligence	Technical Capability	Advanced
29	Visualisation Tools (e.g. Tableau, Qlikview, Qlik Sense, PowerBI)	Technical Capability	Advanced
30	Statistical Package (e.g. SAS)	Technical Capability	Advanced
31	IT Tax Investigation and Tax Audit	Technical Capability	Advanced
32	IT General Control (ITGC) Assessment	Technical Capability	Advanced
33	IT Project Management and Advisory	Technical Capability	Advanced
34	IT Risk Management and Assurance	Technical Capability	Advanced
35	E-Learning Applications	Technical Capability	Advanced
36	Database-to-Database Integration (e.g. Pervasive Integration Architect, Data Mirror's Castellar Hub, SAP solution)	Technical Capability	Advanced
37	Enterprise Application Integration (EAI) (e.g. SAP solution, Oracle, IBM, Web Methods)	Technical Capability	Advanced
38	Business-to-Business (B2B) Integration (e.g. Electronic data interchange (EDI), Extensible Mark-up Language (XML))	Technical Capability	Advanced
39	Automated Control Testing	Technical Capability	Advanced
40	Penetration Testing	Technical Capability	Advanced
41	Cybersecurity Preparedness Review	Technical Capability	Advanced
42	Iso 27001:2005 Gap Analysis and Mapping	Technical Capability	Advanced
43	Disaster Recovery and Business Continuity Planning	Technical Capability	Advanced
44	System Security and Hardening Assessments	Technical Capability	Advanced
45	Digital Audit	Technical Capability	Advanced
47	Voice Mail	Firm Innovativeness	Basic
48	Presentation Software	Firm Innovativeness	Basic
49	Social Media (Presentation Software)	Firm Innovativeness	Basic
50	Sales & Customer Management	Firm Innovativeness	Intermediate

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Assessment of SMPs Level of Technological Competency Skills

51	Vulnerability Assessment	Firm Innovativeness	Intermediate
52	Personal Data Protection	Firm Innovativeness	Intermediate
53	Data Visualization (e.g. graphs, image, tables)	Firm Innovativeness	Intermediate
54	Enterprise Content Management	Firm Innovativeness	Intermediate
55	Business Intelligence (e.g. Crystal Report, Business Objects)	Firm Innovativeness	Advanced
56	Data Warehouse Integration (e.g. Logistics Integrated Database (LIDB), SAP solution, Oracle)	Firm Innovativeness	Advanced
57	Application Server Integration (e.g. Oracle application server, Siebel's Java Data Beans, SAP's JCA (J2EE Connector Architecture))	Firm Innovativeness	Advanced
58	IT Sourcing / Outsourcing	Firm Innovativeness	Advanced
59	Certified Information System Auditor (CISA)	Firm Innovativeness	Advanced
60	Qualified Security Assessor (QSA)	Firm Innovativeness	Advanced
61	Certified Information System Security Professional (CISSP)	Firm Innovativeness	Advanced
62	Service Oriented Architecture (SOA)	Firm Innovativeness	Advanced
63	Service Oriented Integration (SOI)	Firm Innovativeness	Advanced
64	Simple Object Access Protocol (SOAP)	Firm Innovativeness	Advanced
65	Software Development and Customisation	Firm Innovativeness	Advanced
66	E-mail	E-Business Practices	Basic
67	High Speed Internet	E-Business Practices	Basic
68	Official Company Website	E-Business Practices	Basic
69	Smartphones or Tablets (On-The-Go Gadgets)	E-Business Practices	Basic
70	Internet Service (Fixed or Mobile Broadband)	E-Business Practices	Basic
71	Discussion and Chat Technologies (e.g. Messaging, Video Conferencing)	E-Business Practices	Intermediate

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Assessment of SMPs Level of Technological Competency Skills

72	Web Services	E-Business Practices	Intermediate
73	Website Design and Development	E-Business Practices	Intermediate
74	Cloud Computing	E-Business Practices	Intermediate
75	Chatbot (Cloud Messaging)	E-Business Practices	Intermediate
76	Blockchain	E-Business Practices	Advanced
77	Point-to-Point Integration (e.g. IBM MQ Series, WebSphere)	E-Business Practices	Advanced
78	Java API for Web Services	E-Business Practices	Advanced

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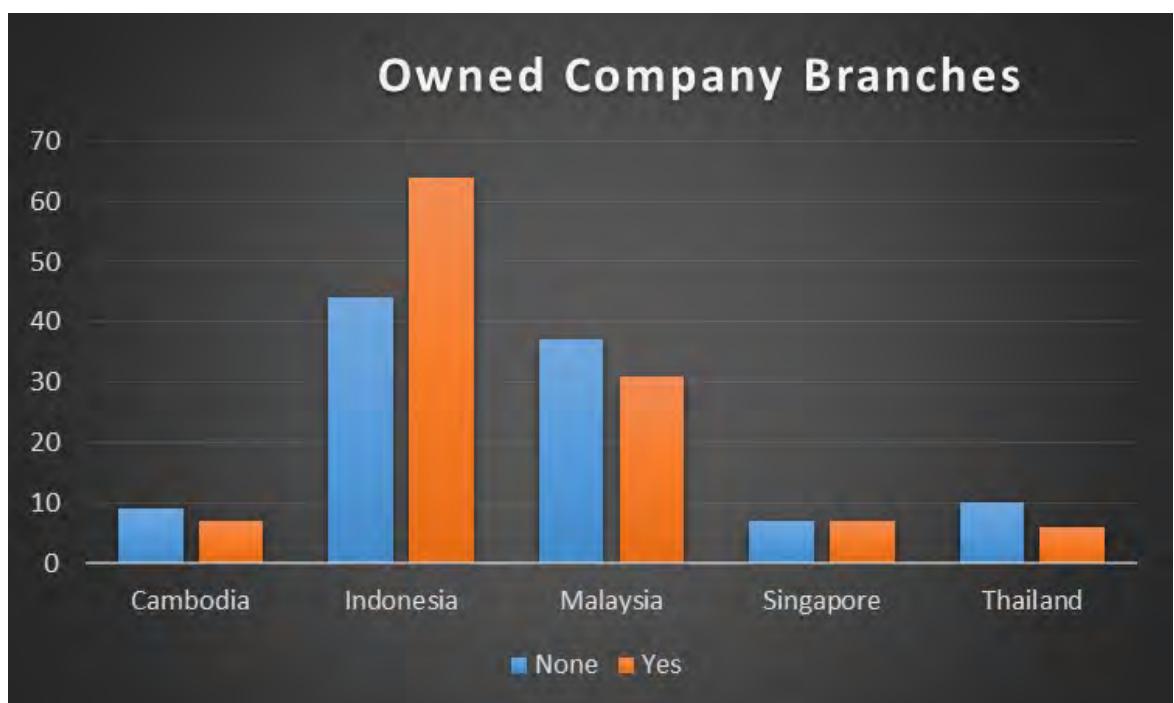
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Section A – Business Profiles



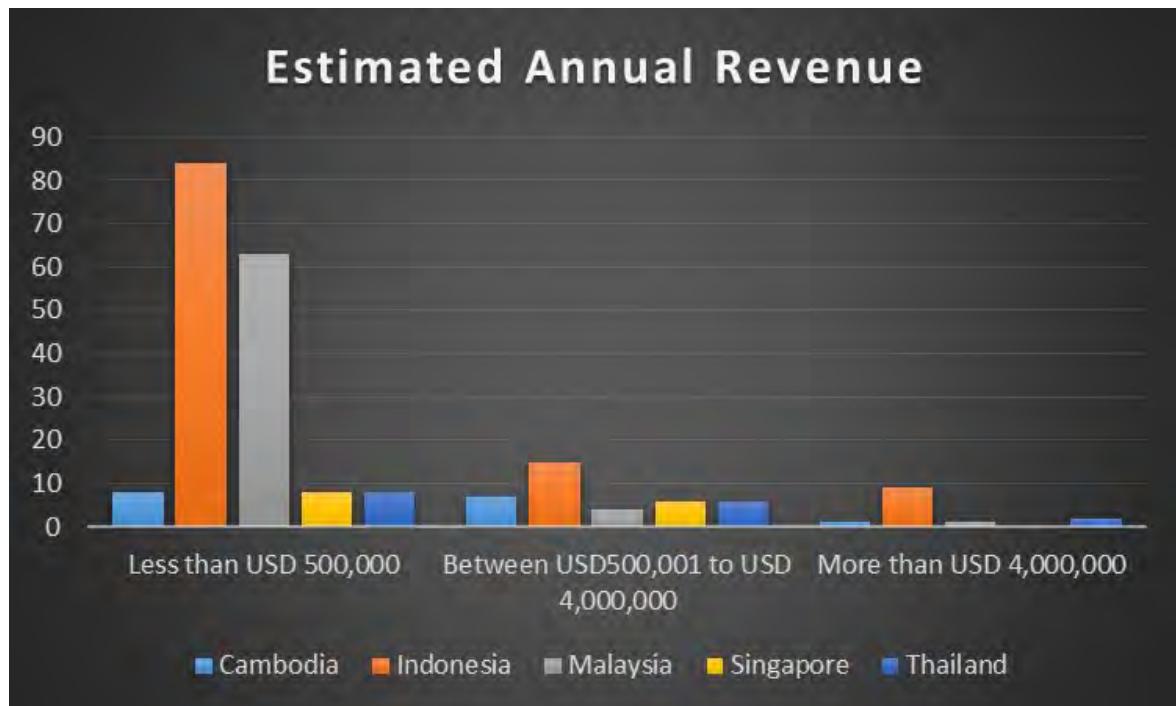
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Section B – Technology Development

- 1) Your firm is aware about the internet of things that affects current business environment.

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Strongly Disagree	1	2	1	1	2	7	3.15%
Disagree	3	3	2	0	1	9	4.05%
Neutral	3	11	5	1	5	25	11.26%
Agree	4	68	32	4	4	112	50.45%
Strongly Agree	5	24	28	5	4	66	29.73%
Total	16	108	68	14	16	222	100.00%

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- 2) Your firm views technology development and implementation as a significant challenge.

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Strongly Disagree	0	0	2	1	0	3	1.35%
Disagree	0	8	3	0	0	11	4.95%
Neutral	1	6	7	0	0	14	6.31%
Agree	8	57	36	6	6	113	50.90%
Strongly Agree	7	37	20	7	10	81	36.49%
Total	16	108	68	14	16	222	100.00%

- 3) Your firm is ready for current technology adoption to its operation.

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Strongly Disagree	1	2	1	1	6	11	4.95%
Disagree	4	2	6	6	2	20	9.01%
Neutral	5	15	16	3	3	42	18.92%
Agree	2	68	30	3	3	106	47.75%
Strongly Agree	4	21	15	1	2	43	19.37%
Total	16	108	68	14	16	222	100.00%

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- 4) Your firm is familiar with the following current technology environment (You may tick more than one answer).

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Mobile Technology	13	77	59	14	15	178	80.18%
Cloud Computing	10	37	43	11	5	106	47.75%
Machine Intelligence	4	11	24	3	1	43	19.37%
Big Data Analytics	6	28	26	10	4	74	33.33%
Internet of Things	7	49	42	5	2	105	47.30%
Artificial Intelligence	1	4	23	5	0	33	14.86%
Robotics	1	3	8	2	1	15	6.76%
Other	0	2	1	0	1	4	1.80%

- 5) Your firm's investment in information technology in terms of percentage of revenue:

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Less than 1% of revenue	3	20	8	5	7	43	19.37%
Between 1% - 5% of revenue	6	49	29	6	3	93	41.89%
Between 6% - 10% of revenue	3	20	19	1	3	46	20.72%
Between 11% - 15% of revenue	1	8	7	0	1	17	7.66%
Between 16% - 20% of revenue	0	8	1	1	0	10	4.50%
Above 20% of revenue	3	3	4	1	2	13	5.86%
Total	16	108	68	14	16	222	100.00%

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6) Your firm's expectation from technology adoption (You may tick more than one answer).

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Better Planning and Controlling	13	80	50	10	8	161	72.52%
Higher Customer Satisfaction	8	45	37	4	5	99	44.59%
Greater Flexibility	13	39	43	11	9	115	51.80%
Agility	7	11	24	9	8	59	26.58%
Increase Productivity and Efficiency	15	82	57	13	14	181	81.53%
Faster Time	13	62	50	11	15	151	68.02%
Encourage A Desired Culture	1	19	26	2	4	52	23.42%
Human Skills Enhancement	11	53	36	11	10	121	54.50%
Other	0	1	0	0	0	1	0.45%

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- 7) Your firm's challenges to successful technology adoption (You may tick more than one answer).

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Insufficient Knowledge of Employees	14	50	44	9	14	131	59.01%
Unresolved Questions Concerning Data Security	5	29	26	4	3	67	30.18%
Lack of Standards Regulations or Certifications	8	25	21	0	8	62	27.93%
Unclear Economic Benefits	4	8	15	8	10	45	20.27%
Unclear Legal Situation Concerning The Use of External Data	2	18	12	1	1	34	15.32%
High Investment Costs	12	75	44	13	14	158	71.17%
Lack of Support from Government (e.g. Fund & Infrastructure)	8	14	28	1	9	60	27.03%
Insufficient Skilled and Ability of Employees	13	36	35	10	13	107	48.20%
Cultural Readiness	4	26	9	5	11	55	24.77%
Other	0	1	0	0	0	1	0.45%

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Section C – Technology Adoption and Usage

- 1) Your firm uses information technology tools and platform in facilitating business and client.

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Strongly Disagree	1	0	2	1	7	11	4.95%
Disagree	3	0	3	5	2	13	5.86%
Neutral	2	0	12	3	4	21	9.46%
Agree	6	0	35	4	2	47	21.17%
Strongly Agree	4	1	16	1	1	23	10.36%
Total	0	107	0	0	0	107	48.20%
	16	108	68	14	16	222	100.00%

- 2) Your firm uses business system and software in improving productivity.

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Strongly Disagree	0	0	1	0	2	3	1.35%
Disagree	0	0	2	0	3	5	2.25%
Neutral	4	0	14	1	5	24	10.81%
Agree	8	0	31	8	4	51	22.97%
Strongly Agree	4	1	20	5	2	32	14.41%
Total	0	107	0	0	0	107	48.20%
	16	108	68	14	16	222	100.00%

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- 3) Your firm understands the positive and negative impact of technology on everyday life of business environment.

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Strongly Disagree	0	0	1	0	0	1	0.45%
Disagree	1	0	1	1	4	7	3.15%
Neutral	4	0	13	0	2	19	8.56%
Agree	8	0	36	12	10	66	29.73%
Strongly Agree	3	1	17	1	0	22	9.91%
Total	0	107	0	0	0	107	48.20%
	16	108	68	14	16	222	100.00%

- 4) Your firm uses the following information technology tools and platform in facilitating business. (You may tick more than one answer).

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Computer / Laptop / Notebook	16	103	67	14	16	216	97.30%
Smartphones or Tablets (On-The-Go Gadgets)	15	52	60	13	14	154	69.37%
Video Conferencing (e.g. Skype & WhatsApp Video)	14	61	27	13	9	124	55.86%
Presentation Software	8	51	30	6	0	95	42.79%
Internet Service (Fixed or Mobile Broadband)	15	67	53	11	11	157	70.72%

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	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Social Media (e.g. Facebook & Instagram)	13	37	27	10	6	93	41.89%
Official Company Website	11	66	23	11	4	115	51.80%
Cloud Computing	4	18	1	0	3	26	11.71%
Storage Device	9	39	32	11	7	98	44.14%
VMware Horizon Flex	0	0	0	0	0	0	0.00%
Server	8	49	26	11	6	100	45.05%
VMware F3Fusion	0	1	0	0	0	1	0.45%
VMware Workstation	0	1	0	0	0	1	0.45%
Voice Mail	4	9	5	10	3	31	13.96%
Email	15	88	58	14	12	187	84.23%
Analytics Tools / Visualisation	1	12	5	6	1	25	11.26%
Data Governance	1	5	4	2	1	13	5.86%
Governance, Risk and Compliance	3	10	4	1	0	18	8.11%

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	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Business Process Modelling	3	10	2	3	0	18	8.11%
Business Process Management	3	8	6	3	2	22	9.91%
Internet of Things	6	30	17	0	0	53	23.87%
Blockchain	0	2	0	1	0	3	1.35%
None	0	1	0	0	0	1	0.45%
Other	0	0	0	0	0	0	0.00%

- 5) Your firm uses the following systems and softwares in improving productivity (You may tick more than one answer).

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Chatbot	5	9	6	2	1	23	10.36%
Accounting and Financial Management Software	13	61	61	13	4	152	68.47%
Time Cost Management Software	4	20	11	5	2	42	18.92%
Robotic Process Automation	0	2	0	0	0	2	0.90%
Enterprise Resource Planning	0	15	2	3	1	21	9.46%

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	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Analytic and Reporting Software	0	22	10	7	1	40	18.02%
Human Resources Software	3	17	15	4	1	40	18.02%
Sales and Customer Management	2	6	6	3	0	17	7.66%
Planning and Scheduling	4	12	3	8	2	29	13.06%
Enterprise Content Management	0	2	41	1	3	47	21.17%
Machine Learning and Artificial Intelligence	0	3	3	0	0	6	2.70%
Office Productivity Tools	12	66	42	0	14	134	60.36%
None	0	7	1	0	2	10	4.50%
Other	0	2	3	0	0	5	2.25%

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Data Collected by Countries

- 6) Your firm uses the following Computer-Assisted Audit Technique (CAAT) in providing services (You may tick more than one answer).

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Visualisation Tools	0	6	2	2	0	10	4.50%
Business Intelligence	0	7	4	1	0	12	5.41%
Audit Management Software	3	17	24	5	3	52	23.42%
Generalised Audit Software	3	39	3	4	0	49	22.07%
Statistical Package	1	8	2	5	2	18	8.11%
Specialised Customised Audit Software	4	30	7	11	9	61	27.48%
None	7	36	34	0	4	81	36.49%
Other	1	4	0	0	1	6	2.70%

- 7) Your firm uses the following software in providing other services (You may tick more than one answer).

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Accounting Software	11	57	57	13	5	143	64.41%
Company Secretarial Software	0	6	21	6	0	33	14.86%
Tax Software	4	21	18	5	1	49	22.07%
None	5	40	7	1	10	63	28.38%
Other	0	4	1	1	0	6	2.70%

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Data Collected by Countries

Section D – Information Technology Services and Advisory Provision

1) Your firm has employed IT professionals for IT advisory services?

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
No	13	53	59	10	13	148	66.67%
Yes	3	55	9	4	3	74	33.33%
Total	16	108	68	14	16	222	100.00%

2) Your IT advisory team obtained the following certifications.

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Certified Information System Auditor (CISA)	1	37	4	2	2	46	20.72%
Certified Information System Security Professional (CISSP)	0	8	4	2	0	14	6.31%
Qualified Security Assessor (QSA)	1	4	3	1	0	9	4.05%
None	13	67	58	10	14	162	72.97%
Other	1	3	2	1	0	7	3.15%

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- 3) Your firm provides the following integration system services (You may tick more than one answer).

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Service Oriented Architecture	0	5	2	0	0	7	3.15%
Service Oriented Integration	0	14	1	3	0	18	8.11%
Web Services	1	15	4	7	4	31	13.96%
Simple Object Access Protocol	0	0	1	0	0	1	0.45%
Representational State Transfer Architecture	0	0	0	0	0	0	0.00%
Java API for Web Services	0	1	0	0	0	1	0.45%
Point-to-point Integration	0	3	0	2	1	6	2.70%
Database-to-Database Integration	0	3	0	0	1	4	1.80%
Data Warehouse Integration	0	6	1	1	2	10	4.50%
Enterprise Application Integration	0	9	3	2	1	15	6.76%
Application Server Integration	0	3	1	1	0	5	2.25%
Business-to-Business Integration	1	3	2	2	0	8	3.60%
None	14	67	55	7	11	154	69.37%
Other	0	4	1	0	0	5	2.25%

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- 4) Your firm provides the following IT Advisory services (You may tick more than one answer).

	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
IT Audit Services	3	32	4	9	2	50	22.52%
IT General Control Assessment	3	19	3	4	2	31	13.96%
Automated Control Testing	1	10	0	0	0	11	4.95%
ISO 27001 2005 Gap Analysis and Mapping	1	1	1	1	0	4	1.80%
IT Governance and IT Risk Assessment	1	14	3	4	1	23	10.36%
IT Project Management and Advisory	2	6	1	2	1	12	5.41%
Vulnerability Assessment	1	5	0	1	0	7	3.15%
Personal Data Protection	1	4	4	1	0	10	4.50%
Digital Audit	1	11	0	3	1	16	7.21%
Penetration Testing	1	3	0	0	0	4	1.80%
IT Internal Audit	4	23	2	7	1	37	16.67%
IT Risk Management and Assurance	1	10	0	3	1	15	6.76%
Software Development and Customisation	0	6	3	0	0	9	4.05%

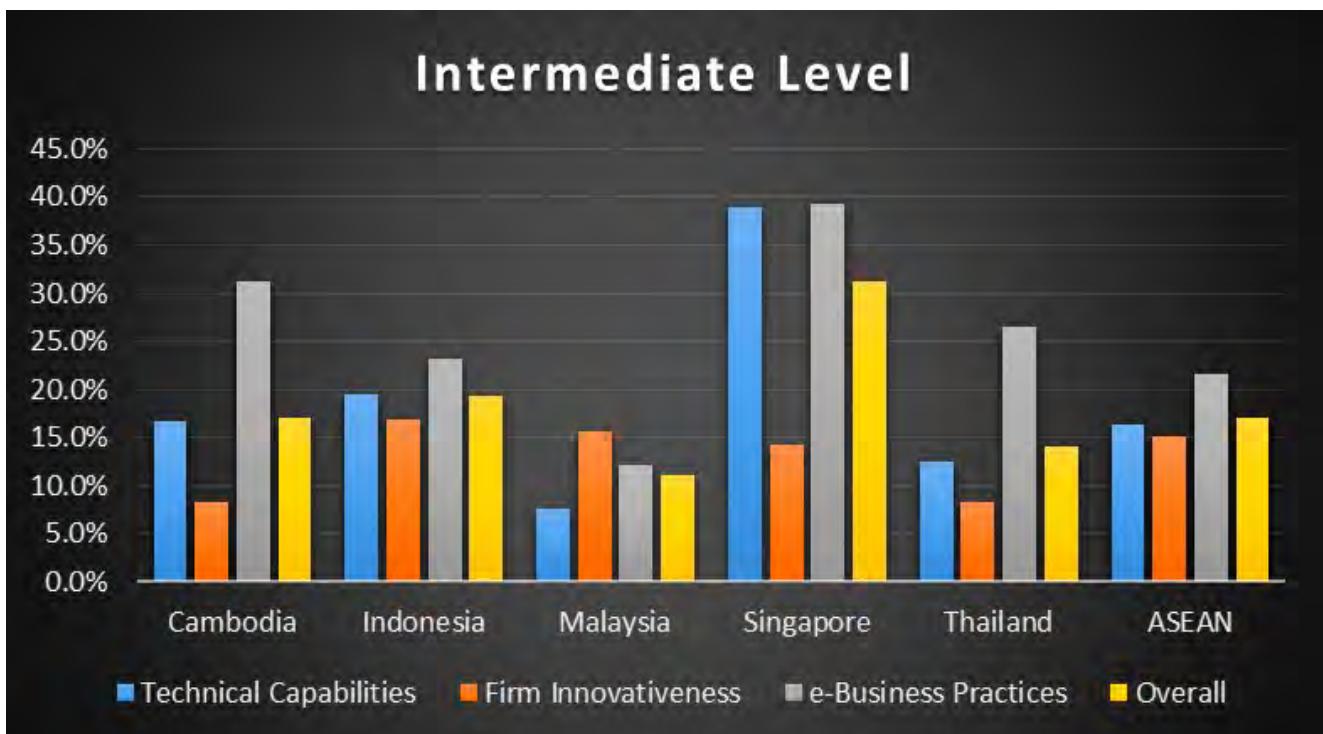
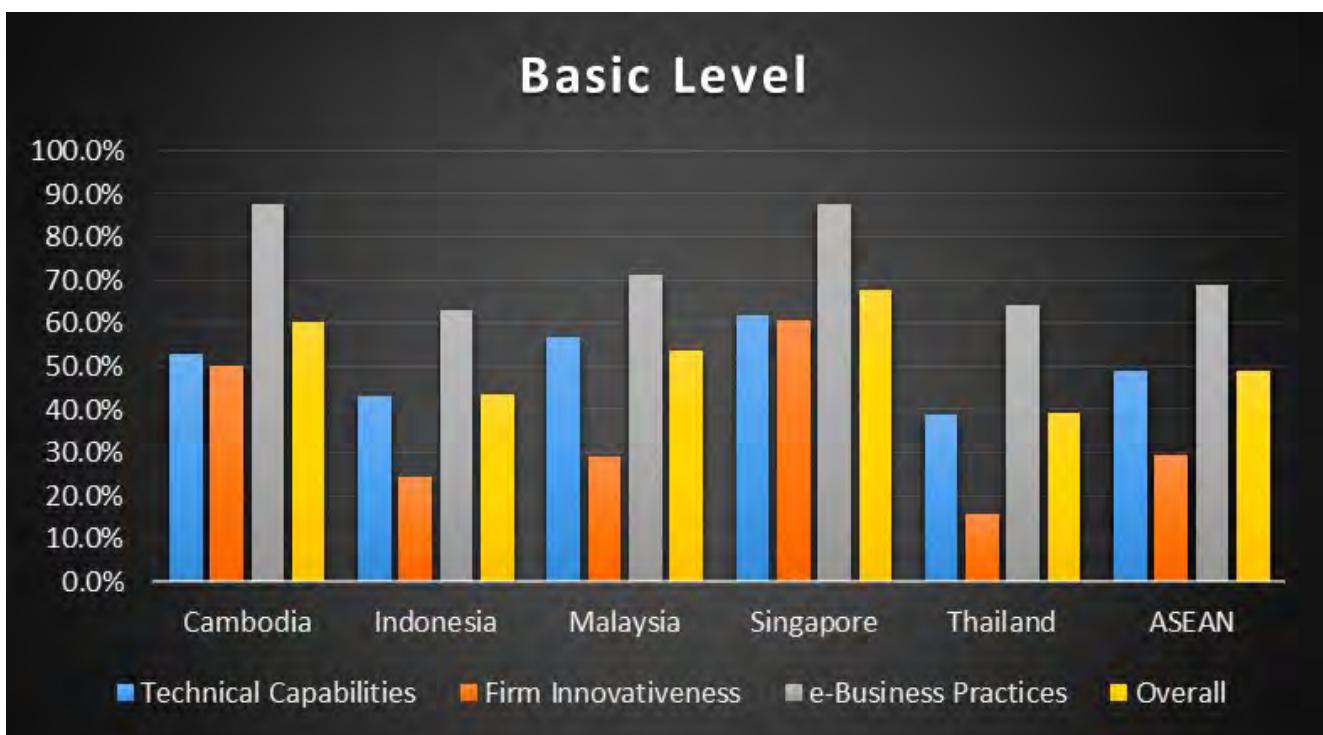
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	Cambodia	Indonesia	Malaysia	Singapore	Thailand	Total	Percent
Website Design and Development	1	6	1	2	1	11	4.95%
IT Tax Investigation	1	6	0	0	0	7	3.15%
XBRL Adoption	0	0	2	2	0	4	1.80%
Cybersecurity Preparedness Review	2	2	0	1	1	6	2.70%
Disaster Recovery and Business Continuity Planning	2	6	1	0	1	10	4.50%
IT Sourcing or Outsourcing	4	2	2	3	1	12	5.41%
System Security and Hardening Assessments	0	2	0	0	1	3	1.35%
IT Training	7	9	17	8	1	42	18.92%
None	5	50	41	1	12	109	49.10%
Other	1	1	1	0	0	3	1.35%

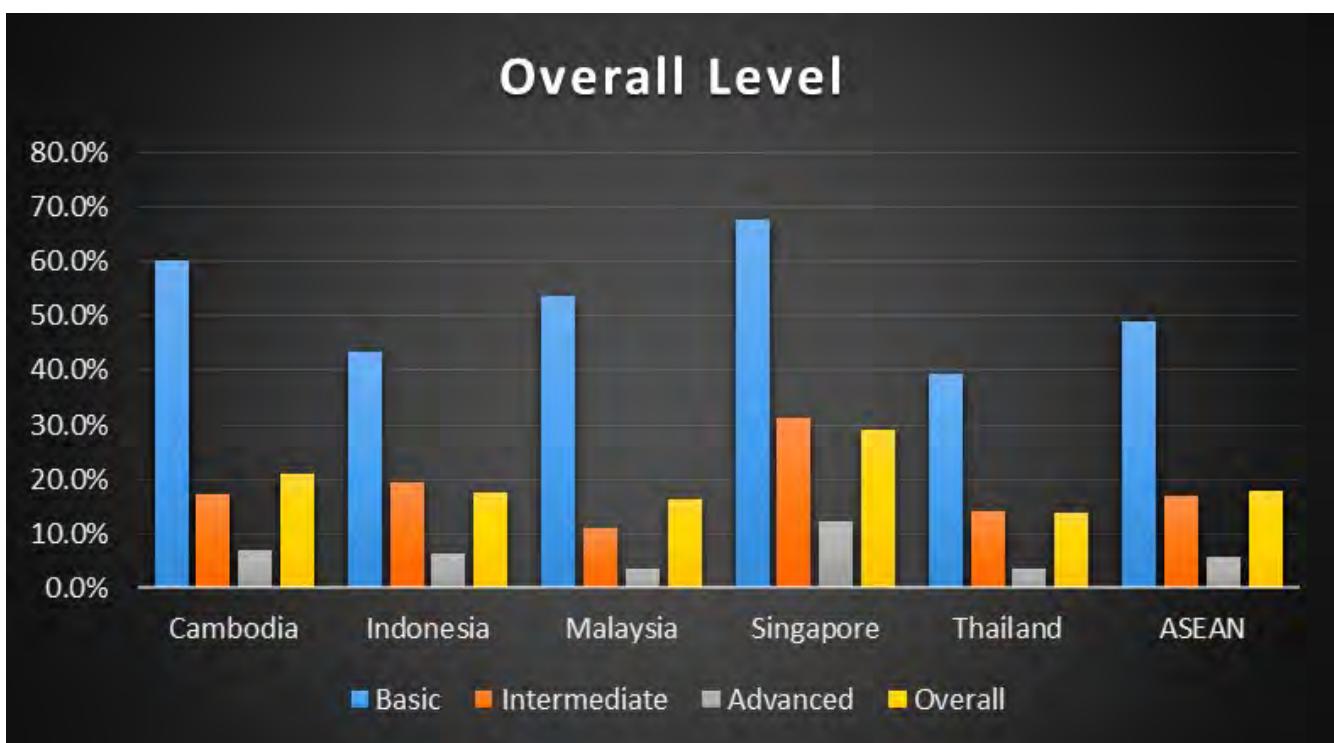
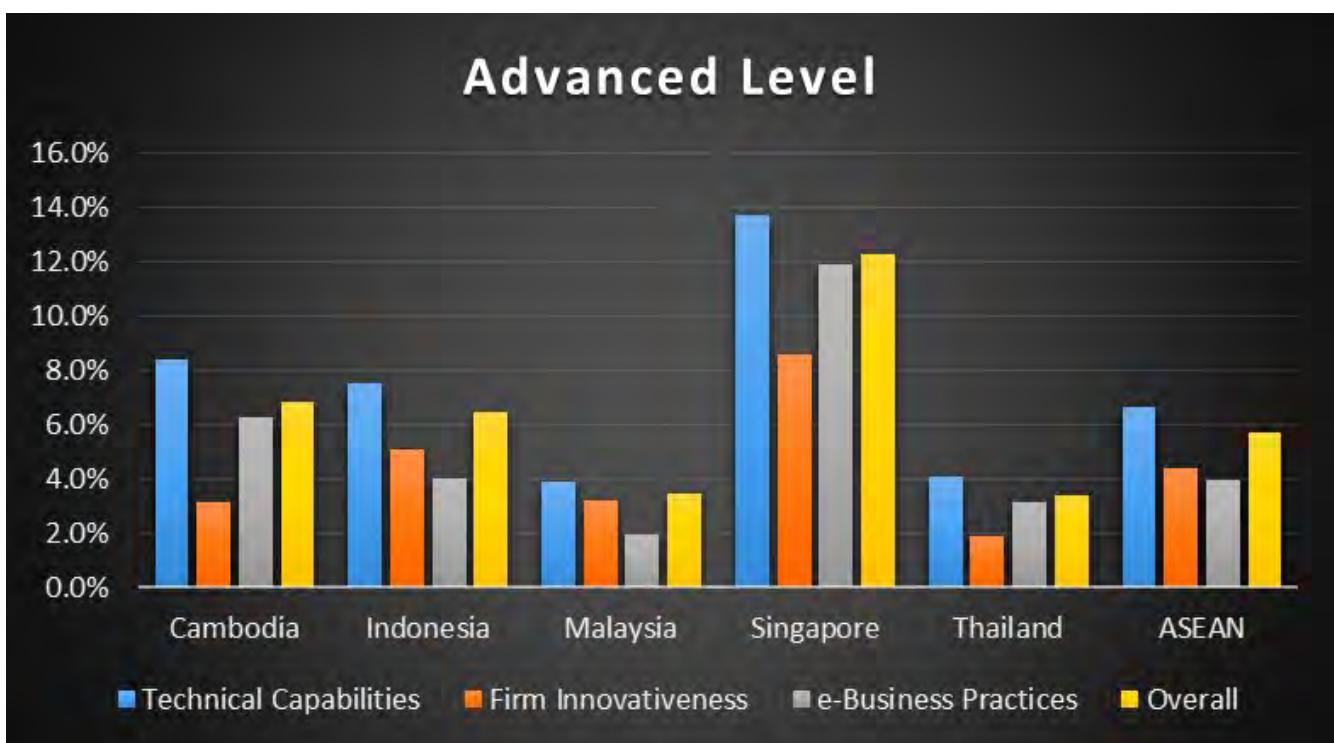
APPENDIX 9

Level of Technological Competency Skills by Countries



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