THE EFFECT OF TECHNOLOGY TO THE BUSINESS PERFORMANCE OF SMALL AND MEDIUM- SIZED ENTERPRISES (SMES) IN MALAYSIA

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DECLARATION

I hereby declared that this thesis entitled

"THE EFFECT OF TECHNOLOGY TO THE BUSINESS PERFORMANCE OF SMALL AND MEDIUM- SIZED ENTERPRISES (SMES) IN MALAYSIA."

is the outcome of my own study, with the exception of the references listed. The thesis is not presently being submitted for consideration for any other degree and has not been approved for any degree.

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DATE : 25 JANUARY 2022

DEDICATION

This research paper is wholeheartedly dedicated

to dear parents which is my main source of motivation.

They always give us strength when we think of giving up, which continues to provide their moral, spiritual, emotional, and financial support.

To supervisors, family and friends who shared words of advice, encouragement, and support to complete this research project.

ABSTRACT

The Asian economy is supported by small and medium-sized businesses (SMEs). In the region's private economy, they support more than 98% of all Asian businesses and two out of every three employments. For Asia's economy to succeed, assistance initiatives for SMEs must be fully operational. SME development is, however, delayed for a variety of reasons, including the difficulties SMEs have with infrastructure and technology costs, information security, and the internet of things. As a result, this study has determined the implications of technical innovations, such as big data, cyber-physical systems, the internet of things, and interoperability, on the efficiency of Small and Medium-size Businesses (SMEs) in Malaysia. A pertinent questionnaire was created and sent at random throughout Selangor.

Keywords – Big Data, Cyber-physical systems, the Internet of Things, and interoperability, business performance, Small and Medium-sized Enterprises (SMEs)

ABSTRAK

Ekonomi Asia berasaskan perniagaan kecil dan sederhana (PKS). Mereka menyumbang lebih daripada 98% daripada semua perusahaan Asia dan dua daripada setiap tiga pekerjaan di pasaran swasta rantau ini. Oleh itu, mempunyai program sokongan operasi sepenuhnya untuk PKS adalah penting untuk kejayaan ekonomi Asia. Walau bagaimanapun, PKS menghadapi cabaran daripada Kos Infrastruktur dan Teknologi, Keselamatan Maklumat dan Internet Perkara yang merupakan beberapa sebab di sebalik pertumbuhan perlahan PKS. Kajian itu mendedahkan kesan teknologi seperti data besar, sistem fizikal siber, IoT dan kesalingoperasian terhadap prestasi perusahaan kecil dan sederhana (PKS) di Malaysia. Di Selangor, soal selidik yang berkaitan telah dibuat dan diedarkan secara rawak.

Kata kunci – Data besar, sistem fizikal siber, Internet of Things, dan kebolehoperasian, prestasi perniagaan, Perusahaan Kecil dan Sederhana (PKS)

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CHAPTER 1

INTRODUCTION

The impact of technology on SMEs in Malaysia will be covered in the first chapter. In this chapter, the entire research effort is summarized. It begins with the study's history, then moves on to its issue statements, research questions, and goal. By following that, the research's significance and a scope will be covered. Finally, the preparation process and conclusions of the study will be covered.

1.1 Background of Study

On May 2, 1996, the Malaysian government made the decision to create a special organisation to support the expansion of SMEs. Create strong, competitive SMEs in Malaysia that could compete on the global market was its aim (A. M. Selase, 2017). Malaysia's economy is significantly dependent on its small and medium-sized firms to flourish (SMEs). The National SME Development Council (NSDC), which legalised SME Corp. Malaysia (2013), asserts that the economy has been separated into the manufacturing sector, the services sector, and any additional general sector.

To guarantee that Malaysia's SMEs are effective not just locally but worldwide, a number of programmes and financial aid have been established and executed. Malaysia is a developing nation with a goal of becoming a developed nation by 2020. To attain a high-income level by 2020, Malaysia's economy must have to be based on SMEs. The Malaysian statistical department estimates that SMEs account for almost

99% of all commercial companies. However, there are more SMEs in the service sector in Malaysia. SMEs are more highly regarded in Malaysia than large businessesbecause of their greater contribution to economic development. For instance, according to the 2012 Economy Census Report, SMEs made up 97.3% of all commercial businesses in Malaysia.

For the economic and social development of many nations, SMEs are essential. SMEs typically have expertise in a particular field, are less bureaucratic, and are more flexible in their decision-making (J. C. Athapaththu, 2018). SMEs may have a competitive advantage over rivals if they adopt new technology (H. K. Mustafa, 2018). Reviewing the corpus of information about SMEs and technology is the goal of this study.

1.2 Problem Statement

Simon Willmet (2019) claims that starting a business is difficult and demands a lot of resolve, perseverance, and effort. According to Malaysia's Department of Statistics (2019), SMEs were responsible for 38.9% of the GDP, 48.4% of all jobs, and 17.9% of all exports in the nation. The traits and performance of SMEs has not only enhanced their resilience but have also resulted in a larger contribution to the country's economy in 2019. This is true regardless of the challenging economic climatethroughout the year.

Based on study, there are three problem that SMEs faced in their business. Firstly, is Cost of Infrastructure and Technology (Asif Ali Syed, 2021). Although there are still some early challenges, it is true that SMEs will experience economies of scale by using technology and reducing their overall expenses. Most academics have discussed how the infrastructure required for general setup and the upfront cost of implementing the technology are problems (Asmat Ara Shaikh, 2021). Investing in technological platforms that may or may not be fully utilized for your operations when operating a business on a tight budget may not be the best course of action (Ishaque Valasseri, 2022). However, the majority of SME's wind-up spending more on

technology than they earn, which finally leads them to stop making the investment altogether.

Second is the most crucial problem now confronting businesses is information or data security. The privacy of someone's personal accounts, property rights data, client information, and other personal data may not always be easy to manage, particularly when using a variety of apps or new technology. More sophisticated attacks are constantly emerging, and the cyber security landscape is constantly changing. Despite being the most vulnerable to one, the majority of SMEs are ill-prepared to defend themselves against a cyberattack (Mark Williams, 2022). This can be attributable to a variety of things, such as inadequate cyber security plans, unskilled staff, and out-of-date IT hardware and software. Small businesses are unable to implement new technology due to their concern of losing out due to such risks. Also, many businesses frequently worry about how to store their data securely (S Quach, 2022).

The third area is the Internet of Things, where IoT applications are now heavily used by both businesses and consumers. However, the Internet of Things may present a large, unforeseen IT challenge for an organization's network transformation plan (CL Niemeyer, 2020). When businesses build their IT infrastructure, IoT devices may frequently be overlooked, which might result in cybersecurity flaws. A malevolent actor could be able to use an unsecured IoT technologies device, like a smart speaker, to access the business's secured Wi-Fi network.

To sum up, technology is a crucial component of business, not only for creating goods for the market but also for boosting the economy. The skills required change along with industrial techniques, and this tendency is anticipated to persist in the coming years. Whether producing items for stock, orders, or assembly, manufacturing requires a perfect balance of power as well as the ability to discern market demands. Manufacturing has long been a crucial part of society, and it seems that this trend will continue as long as people need commodities like food, clothes, vehicles, and medications. Manufacturing technology can supply any tools and processes needed to maintain competitiveness, meet client demand, and be flexible. According to the

research, it is critical to provide a better organizational structure to adapt new technologies, increase people skills and maintain them updated, and proper planning.

1.3 Research Question

The primary goal of this research is to investigate the key factor related to evaluating the influence of technology on SMEs. The research question that will be addressed in this study is as follows.:

RQ1 What are the impact of technology to the SMEs in Malaysia?

RQ2 What are the type of technology that SMEs mostly uses for their business?

1.4 Research Objective

The researcher performs several investigations with the following goals for this research in order to attain the objectives:

RO1 To identify the impact of technology to the SMEs in Malaysia.

RO2 To analyze the relationship between the factors that influencing business performances towards SMEs.

1.5 Scope of The Research

Determine the beneficial effects of technology on Malaysian SMEs is the goal of the research. Distribution of respondents will take place to every firm in Selangor. This is because Selangor has a significant amount of SMEs. Through this study, researcher will also discuss the type of technology that SMEs mostly uses for their business. Several restrictions emerged during the course of this research, including time constraints, a confined site, and respondent honesty. The researcher has a strict time constraint because the data gathering must be completed within three months.

The researcher has no way of knowing if they answered the questionnaire honestly about their own experience with mental health contributing variables at work.

1.6 Research Significance

This study is likely to have a good impact on SMEs in terms of technology. One of the key determinants of how well a firm performs is the Internet of Things. Many of us really cannot see our lives without smartphones. Smart technology is not entirely new, but it is rapidly evolving as the trend of the coming for production.

Assume a place of work whereby related technology might communicate it through Internet and digital manufacturing equipment may "talk to others" and deliver system parameter alerts. Whenever a problem is discovered, a notice should be sent to other devices connected, letting the complete situation to be automatically altered. There would be less downtime, improved quality, less wastage, and lower prices as a result. This technology will result in the creation of new types of jobs for the manufacturing workforce.

1.7 Summary

The background of the study, which was connected to the current state of SMEs, was ended in this chapter. This chapter also discusses the issue that led to the need for this research. Additionally, two study aims and questions have been covered in this chapter. The investigation is the study's main goal on how technology affects business performance in SMEs. Time restrictions were a hindrance for doing this investigation. This study's significance lies in the information it offers on the variables that may affect how well businesses employ technology. It also will be benefit to the SMEs for them to know the factor that influencing business performances towards SMEs and will give the information regarding to the practice for SMEs to adopt technology in their business.

CHAPTER 2

LITERATURE REVIEW

This literature and research findings on the influence of SMEs researched through technology will be examined in this chapter. This chapter's literature and past study provide additional information on technology and SMEs, their relation, the benefits of technology, and an overview of SMEs in Malaysia. This section's information will aid in contextualizing the research question. At the end of this section, a summary was created and used as the study's framework.

2.1 Benefit of Technology to the SMEs

Improved quality of product throughout all phases of the manufacturing process, not just the finished product, is one of the many advantages of incorporating technology into production operations. Further enhancements to plant efficiency in terms of enhanced productivity and material waste reduction, as well as enhancements to the speed and value of communication between the production and operations teams, as well as the front-end sales team.

Technology and its impact on manufacturing, in both term of modernizing old things and inventing new manufacturing methods. Technology is improving production by helping organizations to develop larger quantities, more consistently, and more cost-effectively. Companies must endeavour to employ technology in a sensible way so that its difficulties do not outweigh its various benefits. They should

strike a few balances. The first concern is cost. Innovation is expensive to buy, but it reduces the cost of producing items. For example, utilizing machines to perform dangerous procedures avoids the need for a corporation to pay the higher compensation costs involved with dangerous jobs. This reduces costs while simultaneously increasing staff wellness.

Productivity is the second factor. Using technology to manage or mechanize portions of the production process boosts productivity. This means that a company may either raise its profit margins or lower its pricing to stay competitive. Quality is the third factor to think about. Products from the firm must continually be of good quality. To aid accomplish this, certain aspects of the production process can be industrialized or mechanized. The next quality is flexibility. A company frequently has to balance the flexibility of its people and technology resources. Automation worksgreat for large manufacturing but not for things that will be tailored to each customer'stastes. Customers can select from a variety of extra features in the premium automobile business, some of which may require hand-finishing.

2.2 Theoretical Framework

The aim of this research is to identify the factors that impact how technological innovations within SMEs using technology in their work lives because the hypotheses about relevant exceptions.

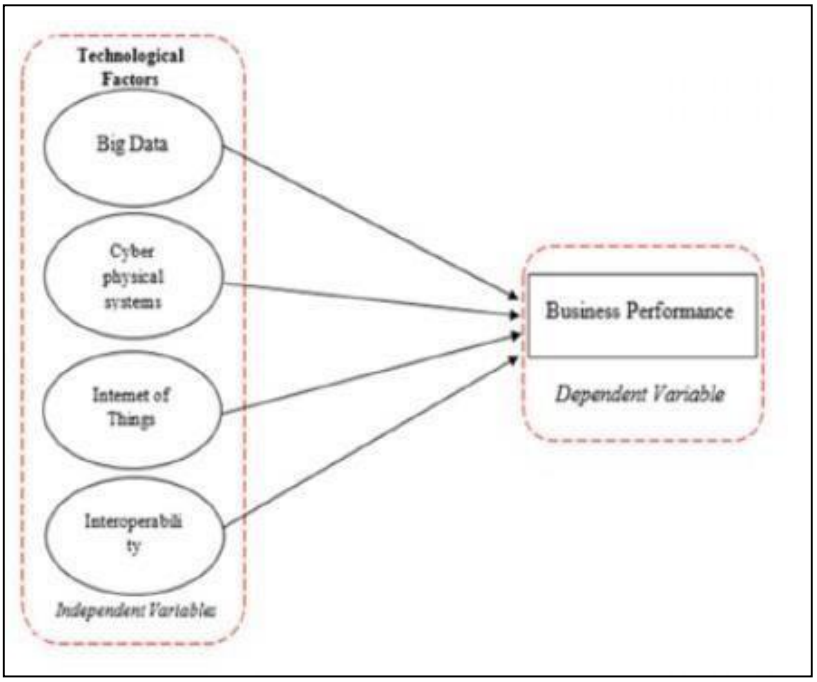

Figure 2.1: Theoretical framework (Source: Mobashar Mubarik, 2019)

2.3 Dependent Variable

As a result of an experimental modification of the independent variable or variables, the dependent variable should affect other measurable variables.

2.3.1 Business Performance

The ability of a corporation to adopt an ideal organizational structure with the goal of satisfying customer and customer needs determines business success, which is strongly tied to commercial effectiveness (E Rekarti, 2017). The final decades of the 18th century saw the beginning of the first industrial revolution. The characteristics of Cyber Physical System (CPS) manufacturing, based on a variety of data as well as knowledge synthesis, are part of the ongoing fourth industrial revolution (WP Neumann, 2021).

Industry 4.0 is a phrase that describes a variety of modern concepts and interconnected industry disciplines that seek to alter corporate procedures (V Alcácer, 2019). The idea behind this collection is that these qualities greatly support improved performance. Among the concerns related to digital transformation taken into account in this study are interoperability, big data, cyber physical systems, and the Internet of Things.

2.4 Independent Variable

The independent variable may be able to predict the dependent variables, according to some theories. The independents that researchers use include big data, cyber-physical systems, the internet of things (IoT), and interoperability.

2.4.1 Big Data

According to the (Doruk Sen, 2019) "Big Data." is the idea of the primary force behind the shift in how corporate ecosystems compete, the transformation of processes, and the facilitation of innovation. For SMEs, using big data to evaluate and forecast consumer and market behaviour is a paradigm change. It can result in more flexibility, productivity, reactivity, anticipation, and capacity to meet consumer needs when properly applied. This can be accomplished by looking at their prior success and combining it with outside data to predict market behaviour and produce fresh insights (Wamba et al., 2015). To handle and analyses structured and unstructured data, cloud computing and open-source Hadoop systems are regarded as cost-effective options. As they create and maintain more transactions data in digital form, SME's may obtain more detailed and comprehensive performance statistics regarding everything from product stock to sick days, which will highlight volatility and enhance performance.

Big data makes it possible to segment clients in ever-narrower ways, allowing for far more precise personalization of goods and services (Aytun Elebi, 2022). Major Data technologies offer several advantages to SMEs, even though they are typically associated with use by big businesses. SMEs can learn things about client behavior that aren't possible to learn using conventional data analysis techniques. According to the studies of (Zhou et al, 2016), Big Data can be used to enhance decision-making, find areas that are wasteful or inefficiency, and optimize company processes. Changing your company's operations strategy is necessary when using big data. Big Data can be used to enhance decision-making, find areas that are wasteful or inefficiency, and optimize company processes.

Any size of organisation should not ignore the significance and value of big data (Council Global, 2019). Small businesses can learn a lot about their clients' shopping preferences thanks to big data. With this knowledge, businesses will be able to personalise their items and services to precisely fulfil the demand of their clients, resulting in higher sales. Small businesses now have the chance to concentrate on the demands of local clients thanks to big data (Lenard, 2018). Zooming in to local market is made easier and more insightful with the use of data tools. Once small companies have a good grasp of how their customers experience them and what they like and hate, they will be able to add a special touch and achieve a competitive advantage.

Businesses are skilled at gathering data of various kinds from almost every corner and crevice (Max Freedman, 2022). While some methods of data collection are extremely technical, some are more deductive. One illustration is place advertising, which creates a tailored data profile using the IP address of a device that is connected to the internet. There are three ways to collect consumer information: directly asking consumers, indirectly tracking customers, and adding information from outside sources to your own data (Jagadish,2018). Big data becomes a more potent tool for distilling the ocean of data into manageable chunks of useful insights as machine learning techniques as well as other types of AI develop.

2.4.2 Cyber Physical Systems

According to a modern trend of platforms called Cyber-Physical Systems (CPS), which merge both physical and computational skills, individuals may communicate with one other in a variety of novel ways (G. Nawanir, 2016). Future technical advancements are greatly facilitated by the potential to interact with and enhance the capabilities of the physical environment through computing, communication, and control (M. S. Shahbaz, 2019).

Cloud computing, the Internet of Things, and digital twins are just a few of the linked concepts that fall under the broad heading of "cyber-physical systems" (Jose Ferreira,2020). These technologies enable businesses to replicate the reality of the actual world in digital settings. They have the capacity to carry out tests, simulations, forecasts, and a wide range of other conceivable operations. This can result in significant increases in a business's ability to compete. Physical twins and its digital twins frequently communicate with one another via cloud computing (André Luiz Oliveira, 2021).

According to Guy Doumeingts (2020), the term "Internet of Things" refers to the collection of data from gadgets, sensors, and other equipment that are networked with computers. Cyber-physical systems enable data analysis and artificial intelligence training to assist in decision-making. Cyber-physical system developments will pave the way for a revolution of "smart" systems and devices, from smart grids to smart autos, which together will result in smart cities. These developments have the potential to transform our world by creating systems that are more responsive, accurate, dependable, and efficient (Abio Lopes, 2020).

2.4.3 Internet of Things (IOT)

IoT technology presents SMEs with a significant chance to create a sustainable and profitable future (Nory Jones, 2020). IoT technology can reduce the environmental impact that organizations have by encouraging greater usage of renewable energy and enhancing energy efficiency. One of the main IoT use cases is predictive maintenance, which has a variety of potential applications fromstraightforward and reactive to intricate and analytical (C. Matt Graham, 2020). IoT devices may gather information from industrial machinery to build models thatforecastwhen interesting occurrences might happen.

This enables businesses to minimize downtime, foresee breakdowns, and plan for them (Ben Snedeker,2022). Adopting the technologies that would allow SMEs to operate more sustainably presents many difficulties. SMEs need strategic guidance to choose the appropriate use cases in addition to enabling elements like money and the requirement for qualified workers. Many SMEs are hesitant to invest fully in IoT and instead choose reliable & secure IoT technologies that are compatible with their company ecosystem.

These platforms enable SMEs to utilize IoT technology created by top IoT experts without requiring them to make large investments (AVAST BUSINESS TEAM,2019). The majority of those cited platforms as having significant scalability and customizability. SMEs can introduce their goods or services to the market considerably more quickly. The information gathered by IoT devices is transformed into business intelligence using big data analytics. A platform with the most cutting-edge IoT technology can be provided by a reputable IoT vendor. SMEs can acquire the greatest IoT technology in this way while staying within their financial means.

Customers' lives can be made more comfortable, safe, and convenient by using the Internet of Things (IoT). If you don't already have a smart lock or video intercom, think about getting wired or wireless security cameras (Market trends, 2022). The Internet of Things (IoT) is following improvement of things that can be networked via the internet or wireless technologies.

2.4.4 Interoperability

Interoperability is generally understood to be the capacity of different system entities to comprehend one another and make use of one another's functions through effective information exchange and communication (BS Chohan,2022). The purpose of interoperability research is to cover the incompatible and heterogeneous aspects of various entities through the process of interoperability (M Noura,2019). Enterprise interoperability develops when it is presented in enterprise computer environments against a backdrop of enterprise. There are three types of interoperability, or the capacity to communicate and work together (E Kajan, 2018).

Interoperability techniques focus on how software components are implemented internally. Each participant shares a common meta-information entity in the unified form of interoperability (L Wu ,2011). The federated interoperability form uses model verification, negotiation methods, and service behaviour monitoring. A process is the coordinated execution of mutual or automated tasks that follow a shared design. Despite being expensive, the solution is effective. A method of the system level paying more attention to interconnectivity involving activities' core is offered. Itis based on an integral framework for interoperability that is SMEs-oriented (M Noura,2019).

2.5 Hypothesis Development

Based on the research framework in Figure 2.1, there are four hypotheses had been made by the researcher to identify factors that will impact of business performance SMEs. The hypotheses are:

(Big Data)

H1: There is a significant relationship between big data and the business performance.