
Factors Influencing the ICT Innovation Process in Small-Medium Enterprises: A Conceptual Framework

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Abstract - The emergence of the digital economy has the potential to spur innovation, boost productivity, and improve societal quality of life. The increase in ICT users in Malaysia can be seen during the Covid-19 crisis. Due to social restrictions on economic activities, many businesses have shifted to online platforms. However, it differs from small-medium enterprises (SMEs) owned by vulnerable populations. Their businesses were underperforming during the Covid-19 crisis as they could not deal with the operational stress generated by Covid-19 due to limited resources, resulting in poor company performance. Therefore, a conceptual model has been identified in this project on the factors that can lead SMEs to successfully innovate the processes of ICT in their businesses.

Keywords - digital economy, small medium enterprise, vulnerable groups, ICT innovation

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I. Introduction

Transformation towards a digital and knowledge-based new economy has driven economic, cultural, social, and political changes. Malaysia has made significant progress in establishing its Information and Communication Technology (ICT) industry, and it is currently ahead of most ASEAN countries in ICT adoption (IMD World Digital, 2020). This contributes to an increase in its digital economy. In Malaysia, the term “digital economy” refers to a more extensive range of activities. Most definitions of the digital economy involve the ICT industry and e-commerce. Malaysia’s ICT sector, on the other hand, includes wholesale and retail ICT trade, content and media activities, and various other ICT services (World Bank Group, 2018)

During the Covid-19 crisis, Malaysia’s use of ICT dramatically increased. Activities such as ordering goods or services online, seeking health information, using internet banking, taking an informal or formal online course, purchasing goods or services via e-Commerce, watching television online, and getting information from government organizations have all increased significantly above 7.0 percent (Department of Statistics Malaysia, 2021). Among the activities, ordering goods or services online showed the most significant increase. This indicates that during the Covid-19 period, most businesses shifted to online operations (Department of Statistics Malaysia, 2021). Since then, the usage of ICT in business significantly impact its operations. When businesses were forced to shift to online operations due to the pandemic, they had the advantage of being able to increase promotion through online applications (Winarsih et al., 2021). As a result, they were able to tackle sales and logistic issues.

However, despite the significant impact of ICT on Malaysia's economy, it is still burdened by two major issues affecting small businesses from vulnerable groups: underachieving performance of the small and medium enterprises (SMEs) owned by vulnerable groups and low level of ICT innovation of SMEs owned by vulnerable groups. Their businesses were underperforming because they could not deal with the operational stress generated by Covid-19, resulting in poor company performance. Plus, SMEs in Malaysia remain on the wrong side of the digital divide. Some SMEs are still unaware of the importance of digital business skills.

Therefore, the purpose of this paper is to present a conceptual model of the innovation process for SMEs owned by vulnerable groups to adopt ICT. The four states of the conceptual model, as well as the elements of the digital economy, vulnerable groups, and SMEs ICT innovation processes, will be described and defined in the following section.

II. Literature Review

Digital Economy

The concept of the digital economy has evolved since its establishment in the mid-1990s due to changes in the nature of technology and its usage by businesses and consumers (Barefoot et al., 2018). Bukht & Heeks (2018) described the digital economy as economic production obtained exclusively or mostly from digital technology, with a business model focusing on digital goods or services. The concept of the digital economy has recently concentrated on adopting digital technology, services, products, processes, and skills across economies. This is known as digitalization. Digitalization refers to the transition of businesses through digital technologies, products, and services (United Nations Conference on Trade and Development, 2019).

According to the United Nations Conference on Trade and Development (2019), the concept of a digital economy includes three levels. The digital sector, which includes the manufacture of electronic products and the provision of ICT services, is covered at the first level of the digital economy. The second level is the digital economy itself, which refers to certain areas of activity that would not exist or be conceivable without the use of ICT technologies. The final level is the digitalized economy, which includes economic activities that had existed prior to the widespread usage of ICT technologies, such as the use of digitized data in organizational operations.

In its official documents in 2019, OECD (2019) replaced the term "digital economy" with "digital transformation." Digital transformation, according to Winarsih et al. (2021), is a shift produced or impacted by the use of digital technology in all aspects of human life. However, Schallmo et al. (2017) defined digital transformation as using technology to increase a company's overall performance or penetration. This means that any activities that make use of ICT will be referred to as a digital economy (Schwertner, 2017). Activities such as ordering goods or services online, seeking health information, using internet banking, taking an informal or formal online course, purchasing goods or services via e-Commerce, watching television online, and getting information from government organizations are all categorized under digital economy (Department of Statistics Malaysia, 2021).

There are numerous statistical distortions in terms of the growth of a country's digital economy, as not every country has wholly employed ICT in their lives or business (Ganichev & Koshovets, 2021). This concept of digital transformation was implemented in Malaysia to determine the country's level of the digital economy where it includes wholesale and retail ICT trade, content and media activities, and various other ICT services (World Bank Group, 2018).

Vulnerable Groups

According to United Nations (2020), previously, the concept of "vulnerable groups" did not have a universal definition. However, during the Covid-19 crisis, the United Nations devised a framework for improving a country's socioeconomic situation. The United Nations has classified vulnerable groups as "at-risk groups," emphasizing that "this is a population that experiences the highest degrees of socioeconomic marginalization, which deserves special attention.

According to Economic Planning Unit (2021), vulnerable groups in Malaysia are only people from the low-income group (B40), women, and people with disabilities.

SMEs Owned by Vulnerable Groups

Vulnerable groups are more inclined to run small companies for a living since they have experienced many obstacles when working in a workplace. According to Ibrahim Mamat et al. (2016), low-income people come from various backgrounds, ages, and health levels. Due to their low level of education and lack of opportunities to advance in a company, this group has only one choice to manage small businesses.

Apart from that, according to Manaf et al. (2018) and Jing (2019), job concerns among people with disabilities (PWDs) are still not well addressed, even though these issues have long been contested. Manaf et al. (2018) stated that the engagement of PWDs in the workforce is still limited due to their competency limitations compared to ordinary people. Unequal access to education and training, inaccessible buildings and transportation, lack of accessible information, lack of assistive devices and support services, and other related insufficient facilities might hinder PWDs from entering the employment sector. As a result, being a business entrepreneur is ideal for them to work in a flexible environment (Mustaffa et al., 2020).

Furthermore, the growing number of women in business has become one country's new engines for economic growth. They tend to engage in business activities due to the unequal distribution of household work, which appears to be a substantial barrier to women's job advancement (Mair et al., 2012; United Nations, 2020). Besides, gender inequality and discrimination in the workplace are prominent factors motivating women to start their businesses rather than working for someone else (Kodagoda & Samaratunge, 2022; United Nations, 2020).

SMEs Business Performance during Turbulent Time

During the Covid-19 crisis, some businesses took advantage of the opportunity to carve out a new niche, while many SMEs struggled to adjust to the new environment (Bretas & Alon, 2020). Due to their low resources, SMEs are more sensitive to environmental crises, and COVID-19 is particularly harmful to them (Utomo et al., 2021).

Ministry of Finance Malaysia (2022) undertook two surveys to investigate the impact of the Covid-19 pandemic on micro and small businesses. The first survey was performed from August to October 2020, and the second was from July to August 2021. According to the first survey, SMEs' average monthly revenue had decreased by 60%. However, in the second survey, they discovered that the average monthly income of SMEs had decreased to 49 percent from 60 percent in the first analysis. This was due to standard operating procedures (SOPs) modifications, which allowed them to function for extended periods. Although both surveys received positive responses, they recovered due to changes in SOPs that allowed them to operate. The innovation of ICT continues to lag.

According to Loh et al. (2021) and Mohamad (2021), they lack the talents and skills to use this rapidly expanding technology. This is because, in order to innovate their business and successfully embrace ICT in business operations, they must focus not only on accepting ICT but also on how they can successfully adapt it in their organizational processes and contribute to good business results (Ndayizigamiye & Khoase, 2018; von Leipzig et al., 2017).

Therefore, this study will focus more on the organizational characteristics that can contribute to the success of the innovative process of ICT within SMEs businesses (Trott, 2011). The organizational characteristics include receptive to change, acceptance of risks, creativity, coordination within the organizational structure, and commitment.

ICT Innovation for SMEs Business

A successful and sustainable SME requires the combination of essential contextual factors such as strong leadership and organizational practices (Alraja et al., 2022). SMEs may start with enthusiasm and a strong vision, but in order to achieve the outlined performance goals and maintain a competitive advantage, the correct technological support, and aligned processes must be in place (Salim, 2020; Teresa Matriano & Firdouse Rahman Khan, 2019)

Information and communication technologies (ICT) enable various types of innovations due to their long-term evolutionary flow from assets that support information processing and automation of administrative activities to ubiquitous technologies that today can make products capable of processing and delivering information over the internet (Neirrotti & Pesce, 2019).

ICT innovation is also known as technological innovation. Some academics investigated the adoption of technological breakthroughs using various models and theories, such as the economic theory (Omri, 2020) and open systems theory (Cancino et al., 2018). Alraja et al. (2022), on the other hand, adopted the technology-Organisation-Environment (TOE) model developed by Tornatzky et al. (1983) to identify elements that can contribute to the successful adoption of technological innovation in an organization.

This study, however, adopted the Diffusion of Innovation Theory developed by Rogers (2003). Rogers' diffusion of innovations theory is ideally suited to studying technology adoption in business organizations, particularly small and medium-sized businesses. This is because technology is intended to reduce ambiguity in the cause-and-effect relationship involved in reaching the desired goal. From Figure 1.0, all five stages in the innovation-decision process developed by Rogers (2003) can relate to technological innovation. However, in order to successfully adopt technology in business organization processes, there are several factors that

organizations need to consider (Trott, 2011). According to Trott (2011), organizational factors that enable successful technology innovation include receptive to change, acceptance of risks, space for creativity, coordination of a diverse range of skills, cross-functional cooperation, coordination within the organizational structure, vigilance and commitment to technology.

III. Conceptual Framework

The Diffusion of Innovation Theory model developed by Rogers (2003) can also be referred to as the innovation-decision process. The innovation-decision process for technological innovation begins with the knowledge stage. Figure 1.0 shows that there are two antecedents in the knowledge phase, which are receiver variables and social system variables. The receiver's variable defines the personality and social characteristics toward change. Leaders can influence and shape such attributes when the owners of a company are committed to adapting and enhancing their business operations to attain long-term viability amid times of upheaval. At this point, business owners are eager to learn about technology advancements and seek knowledge on the subject. Aside from that, the social system helps at this stage because they share common goals and objectives with the leaders. Individuals, informal groups, organizations, or subsystems can all be members or components of a social system.

The persuasion stage is the second stage in the innovation-decision process for technological innovation, where business owners begin to shape their attitudes toward innovation. They begin to assess the benefits of innovation in order to determine whether or not to apply the new idea. Figure 1.0 depicts how members of the social system view the features of innovation based on five aspects: relative advantage, compatibility, complexity, testability, and observability. Because of the unique nature of their enterprises, the innovation process of small and medium-sized firms is distinct and diverse from those of other industries. As a result, it is expected that members of the social system in Malaysian small and medium-sized firms will respond differently to innovation activities.

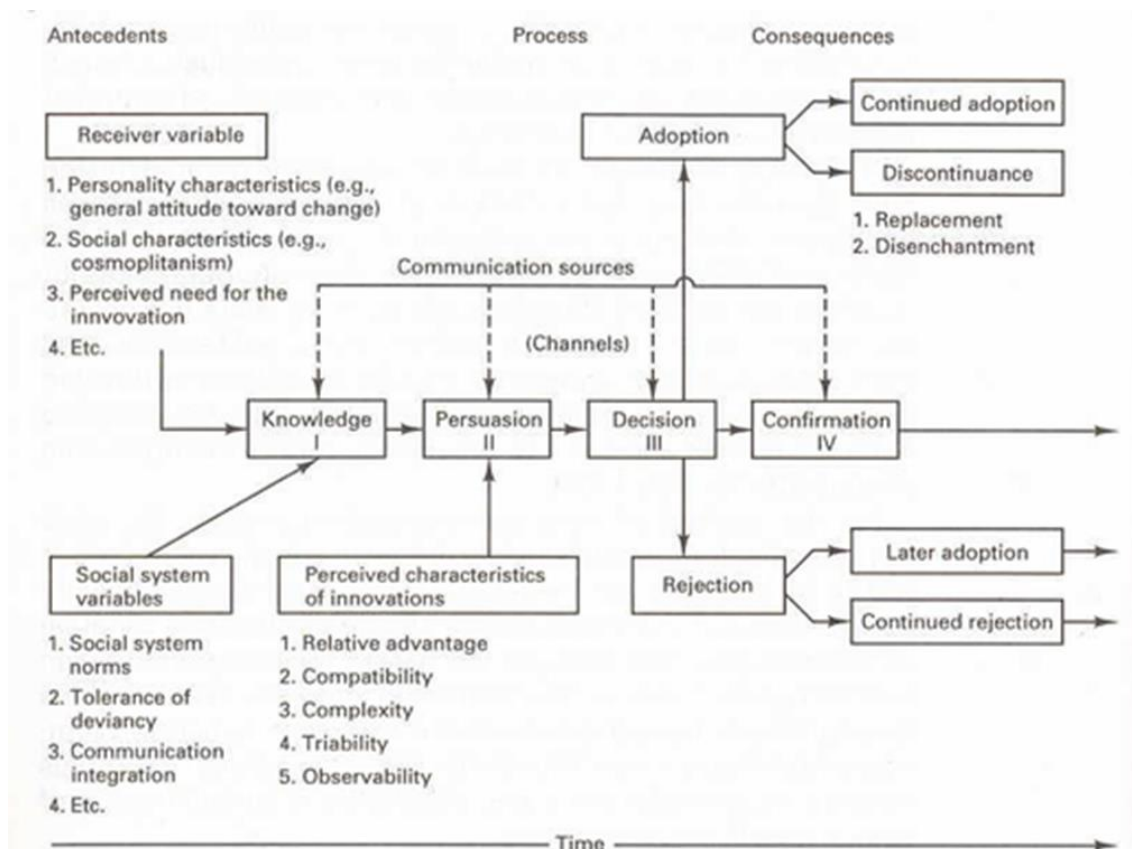


Figure 1.1: Diffusion of Innovation Theory Model based on Rogers (2003)

When a decision is made to embrace a new idea, the implementation process begins, during which innovation is put to use. Finally, the confirmation phase occurs when business owners analyze the decision made throughout the innovation-decision process to determine whether to continue employing the innovation and maximize its potential.

For this study, the innovation-decision process of Rogers (2003) only analyzes from the knowledge phase to the decision phase as this study aims to examine whether the organizational characteristics significantly impact the ICT innovation process in SMEs business.

As illustrated in Figure 1.2, the organizational characteristics are classified under the receiver variable, which is the business owners' personality characteristics to implement the change in their business operation. Apart from that, ICT innovation is classified under perceived characteristics of innovation where the attribute of ICT innovations is in line with perceived characteristics of innovation: relative advantage, compatibility, complexity, trialability, and observability. Lastly, the decision of business owners to classify their business to successfully implement the ICT innovation by organizational characteristics is under the decision phase. Thus, the proposed conceptual framework has been illustrated in Figure 1.3.

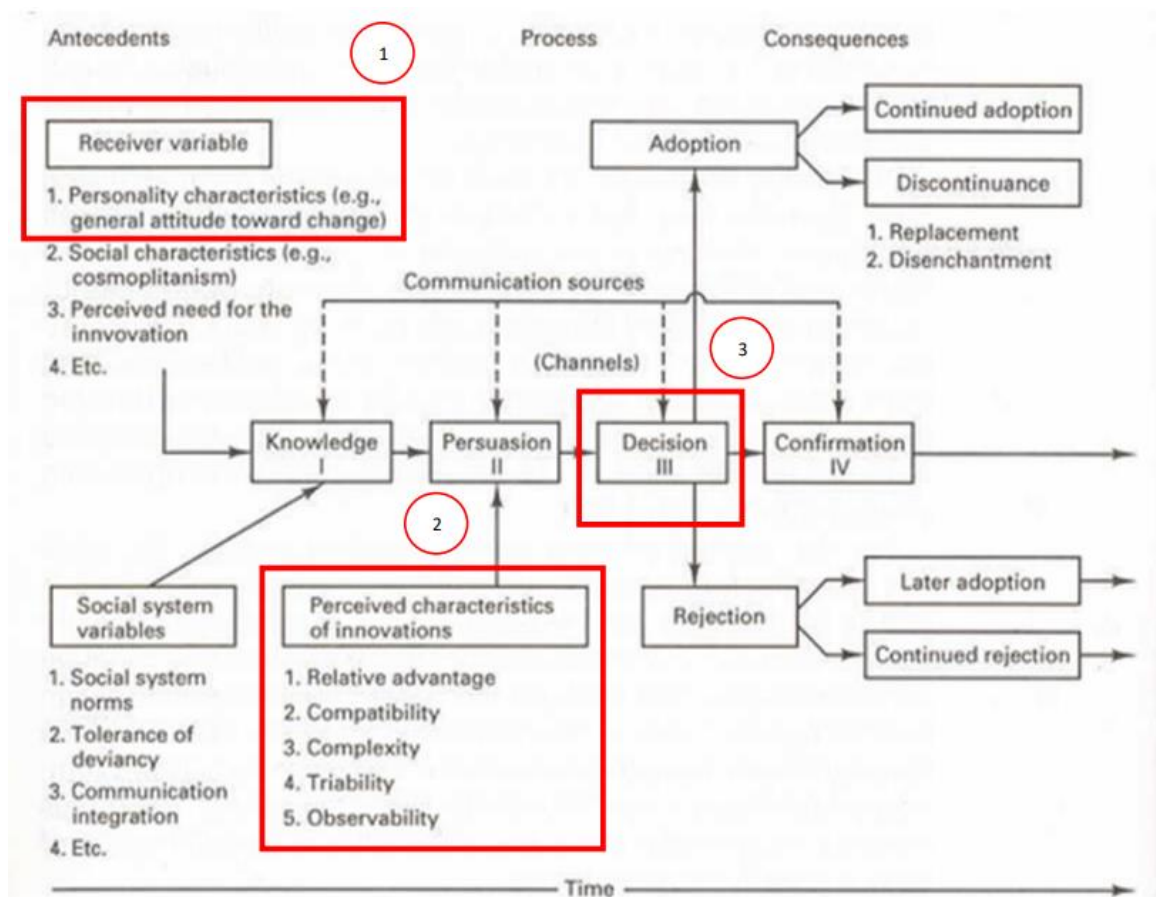


Figure 1.2: Diffusion of Innovation Theory Model
Source: Rogers (2003)

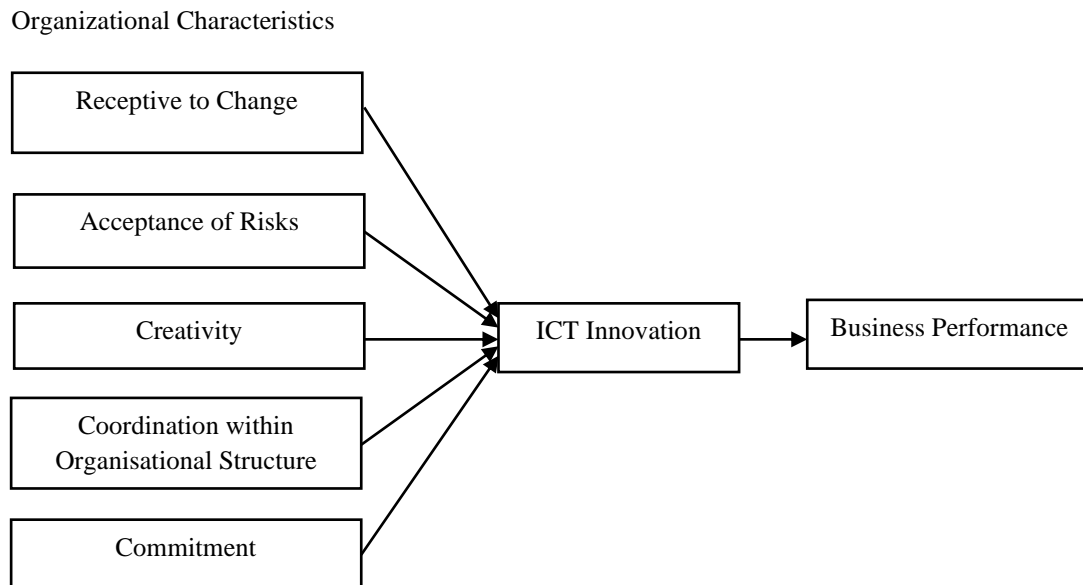


Figure 1.3: Proposed Research Framework
Source: By Author

IV. Methods

This study used a systematic review approach which involved collecting and analysing articles that pertaining to the topic of this paper. Journals such as the Journal of Business Research, the Journal of Business Venture Insights, the Journal of Industrial Marketing Management, and others have been reviewed as quantitative and qualitative reference databases. Keywords such as "COVID-19," digital economy," "small and medium enterprises," "vulnerable group," "digital innovation," "innovation process," "low income people," "people with disabilities," "women entrepreneur," "discrimination," and "ICT innovation" were used to search for and adopt references in this study. The papers from 2018 to 2022 were accessed from Scopus, Elsevier, Science Direct, and Emerald Insight.

V. Conclusion

This paper presents a model for SMEs that want to enhance the role of ICT in increasing their business resilience during turbulent times. Previously, the Covid-19 pandemic had impacted their lives and livelihoods as most SMEs were owned by vulnerable populations such as low-income earners, women, and people with disabilities. Therefore, a conceptual framework has been proposed in this study that can contribute to the success of SME businesses based on the current digital environment through ICT innovation in business processes. In order to successfully innovate business and adopt ICT in business operations, companies must focus not only on adopting ICT but also on knowing how to adapt it successfully in their organization to produce good business results.

Further studies can be conducted by validating the framework design. The data can be collected through questionnaire surveys and in-depth interviews with creative industry players.

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