The Involvement of Muslim-Owned Small Medium Enterprises (SMEs) in E-Commerce: The Role of Technological Infrastructure and Digital Literacy During Pandemic of Covid-19 in Perlis, Malaysia

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ABSTRACT

The global outbreak of pandemic Covid-19 has shown an increase in E-business, particularly in E-commerce. As more people opt for E-commerce and online purchasing, SMEs must diversify their revenue and profitability by transitioning to online operations to sustain during the pandemic. Therefore, this study aims to obtain information, then descriptively analyse the technological infrastructure and digital literacy with respect to the involvement in E-commerce by Muslim entrepreneurs. This study used a questionnaire as the instrument of the research. It was done in the state of Perlis, Malaysia with Muslim entrepreneurs involved in SMEs was chosen using a convenient sampling technique. A total of 50 questionnaires were returned satisfactorily. Data were analysed and interpreted by using Statistical Package for Social Science (SPSS) computer software program. A descriptive study that includes mean, standard deviation and percentages for each component in technological infrastructure and digital literacy were employed. Most of the respondents have an uncertain view of technological infrastructure but agreed about digital literacy in the involvement of SMEs in E-commerce in Perlis during Covid -19.

Keywords: Covid-19, Digital Literacy, E-commerce, Technological Infrastructure

INTRODUCTION

On 12th January 2020, World Health Organization (WHO) announced the epidemic outbreak known as coronavirus disease 2019 (Covid-19) as a global emergency (WHO, 2020). It forced countries to implement a lockdown to contain the diseases. The Government of Malaysia executed the movement control order (MCO) on 18th March 2020 because the number of Covid-19 cases escalated rapidly (Sukumaran, 2020). To "flatten the curve", businesses and stores judged non-essential were ordered to shut down during MCO. All schools, institutes of higher learning, and houses of religion have been instructed to close during the period to limit venues where people could congregate (Bunyan, 2020).

Undoubtedly, the global outbreak of pandemic Covid-19 and the necessary countermeasures put in place have suddenly hurt the economies (Kuckertz et al., 2020). Due to that, small enterprises are most affected by the crisis due to the financial constraint of the business (Bartik et al., 2020). This resulted in most companies discontinuing their operation or suffering losses compared to larger firms (Hall and Wahab, 2007). This can be supported by Charlie and Azizah (2020) as their study revealed that due to the implementation of the orders to contain the disease as layout by the government of Malaysia, local entrepreneurs, especially Bumiputera-owned SMEs were more affected as they faced difficulties sustaining their business, mainly in acquiring the raw materials, supply chains and distribution channels, financial capability, and decreased customer transactions.

However, looking at the silver-lining, this pandemic has shown an increase in the field of E-business, particularly in E-commerce. According to the Malaysian Communications and Multimedia Commissions (MCMC), the emergence of the Covid-19 pandemic has shown more people spending time online; thus, the increase of five years in online business has occurred (Faziedah et al., 2020). As more people opt for E-commerce and online purchasing, SMEs must diversify their revenue and profitability by launching online or digital enterprises. Thus, SMEs must transition to online operations to sustain themselves during the pandemic. Furthermore, the Malaysian government fully supports local SMEs who want to go online and digitalise their operations (Karr, Loh, and Wirjo, 2020).

The question is, did the local SMEs, especially Muslim entrepreneurs are well digitally literate, and did technological infrastructure provided in the area good enough to support their involvement in E-commerce, especially during this pandemic Covid-19? Measuring the involvement of SMEs in E-commerce has piqued the interest of countless academics and sparked numerous debates and research because there are no universally accepted measurements of this concept (Ominu, 2019). Therefore, this study aims to obtain information, then descriptively analyse the technological infrastructure and digital literacy with respect to the involvement in E-commerce by Muslim entrepreneurs.

The findings of this study are expected to assist local SMEs in identifying key features that need to be addressed in each of these two areas to expand their businesses. This research is also intended to aid local governments in providing required facilities to local SMEs by utilising E-commerce as one of the economic activity enhancers.

LITERATURE REVIEW

Technological Infrastructure

Having infrastructure is very essential in order to provide E-commerce services, but most of the developing countries lack of it. A study conducted by Sleem (2005) claimed that the current evolution of E-commerce requires three types of infrastructure: technological infrastructure, financial infrastructure, and legislative infrastructure.

The shared foundation of technology capabilities for constructing business applications is provided by technological infrastructure, which is divided into two layers. The first layer is concerned with technology components such as computer and communications technologies, which are readily available commodities. The second layer refers to a collection of standard services such as data processing management, electronic exchange capability, and database management (Broadbent and Weill, 1997). This can be supported by Sleem (2005), stating that technological infrastructure is required to establish an internet marketplace. This is predicated on plenty of technologies, the improvement of that's intending at breakneck speeds for example interconnectivity amongst telecommunications, cable, satellite, or different internet backbones, internet service providers (ISPs) to attach marketplace members to that backbone, and end-person gadgets inclusive of PCs, TVs, or cell telephones (Sleem, 2005).

Integrating technological infrastructure in an organisation has enhanced business performance (Croteau et al., 2001). Croteau et al. (2001a) summarised an organisation technological infrastructure of an organisation in three dimensions: architecture, work processes, and skills. The architecture comprises applications, data, and technology. The work processes are fundamental for the operation of the technological infrastructure, which consists of the development and maintenance of the systems as well as the monitoring and control systems. Competencies involve the knowledge and skills necessary to effectively manage the technological infrastructure. In Tapscott and Caston (1993), organisational, technological infrastructure should include user involvement, connectivity, distributed computing, flexibility, and technology awareness.

For this research, we use the technological infrastructure in organisations to study the involvement of SMEs in E-commerce. We will apply the dimensions proposed by Tapscott and Caston (1993) as it suits our study. Table 1 below clearly defines all the dimensions or components in technological infrastructure.

Table 1: Components of Technological Infrastructure.

Component	Definition
User involvement	A psychological condition that indicates a user's conviction in the importance and personal relevance of a system (Harwik and Barki, 1994).
Connectivity	Connectivity in the form of global networking supports enterprise-wide applications and inter-organizational systems, enables cooperation, and communications (Tapscott and Caston, 1993).
Distributed computing	Many organizations have been restructuring their technical resources toward more decentralized business structures to streamline their operations and increase both efficiency and effectiveness. New IT parallels the organizational goal of empowerment by distributing information and processing power closer to the user (Tapscott and Caston, 1993).
Flexibility	Technology should be more flexible, being more versatile in collecting and processing, as well as a reduction in the time required to respond to changes in the company's market definition. This is needed to experience new opportunities (Dass, Zhara and Warkentin, 1991).
Technological awareness	Technology awareness entails a genuine interest in IT, both inside and outside the organization. As new technological innovations appear in the market regularly, practitioners and researchers must maintain an awareness of each other's efforts (Boynton and Zmud, 1987).

Digital Literacy

Digital literacy is a 21st-century skill set that every individual should acquire. The notion of digital literacy has changed dramatically as a result of several significant advancements. According to Mohammadyari and Singh (2015), being digitally literate means knowing about various technologies and understanding how to use them, and being aware of their impact on individuals and societies. Ng (2012) clearly defined digital literacy as the ability to access, search, evaluate, modify and distribute digital media and develop skills in using new technologies.

The utilisation of E-commerce by SMEs is part of digital literacy, and every entrepreneur needs to sustain itself in this competitive environment. Social media is a vital part today as people are always in touch with smartphones. Various applications make it very easy to manage businesses and expand the reach of the online market. Numerous groups, trending topics, and communities are significant for business entrepreneurs to follow. Such capabilities, developed with web management into E-commerce, supported by big data and coding, are conditions to launch a start-up where technology-based entrepreneurs can communicate and reach the broader market.

E-commerce by SMEs is a form of digital literacy, and any business must stay competitive in today's market. People are continually connected through their smartphones through various applications of social media. The available applications make it simple to run a business and broaden the internet market's reach. This can be accomplished, for example, by following a broader range of corporate companies to observe and learn about their business strategies and notice current concerns and community events, all while using smartphones. Technology-based entrepreneurs will be able to access a wider audience.

Lack of technical grasp of information technology, high cost of internet access, complaints from purchasers because the goods do not match the original, and other limits are barriers that SMEs face when using E-commerce (Candra and Ashari, 2014). Based on the advantages as mentioned above and disadvantages of digital literacies, this study will adopt six out of seven domains of the digital literacy model (SDDL), which was developed and validated by Kurtz and Peled (2016) to measure the involvement of SMEs in E-commerce during Covid-19 in Perlis, Malaysia. The seven domains or components of digital literacy (SDDL) are collecting information, evaluating data, information management, processing information, teamwork, integrity awareness, and social responsibility. Only six domains that exclude teamwork were selected to suit our study. All the components of digital literacy are clearly defined in Table 2.

Table 2: Components of Digital Literacy

Component	Definition
Collection of information	The ability to recognize information needs, access, understand and use information by employing the Internet, professional organization databases, and search engines (Lau and Yuen, 2014).
Evaluation of information	The ability to evaluate the quality, reliability, relevance, timeliness, completeness, credibility, usefulness, and efficiency of digital resources (Lau and Yuen, 2014).
Information management	The ability to protect personal data and information from threats such as unauthorized access, destruction, identity theft, impersonation, unauthorized alteration of data, or fictitious creation (Lau and Yuen 2014).
Processing information	The ability to use ICT to design or create new information from information already acquired (Lau and Yuen, 2014).
Integrity awareness	Relates to the ethical use of gathered information, it involves integrity, honesty, and fairness in searching and collecting information, as well as to how new knowledge based on it is created (Lau and Yuen 2014).
Social responsibility	Represents understanding the social and ethical implications/consequences of the use of digital resources (Lau and Yuen, 2014).

METHODOLOGY

The study was conducted in Perlis, Malaysia, and Muslim entrepreneurs in SMEs engaged in E-commerce were picked at random, regardless of their age or type of business. Perlis was selected because the state was ranked as one of the states in Malaysia with the minor gross domestic product (GDP) per capita in 2016, according to the Mid-Term Review of the 11th Malaysia Plan (RMK-11), because it dominates only the agricultural industry (Bernama, 2019). As a result, Perlis has become one of Malaysia's most backward and impoverished states. Investigating the involvement of SMEs in E-commerce in Perlis can help identify the crucial elements that they need to improve to expand their business.

A set of questionnaires consisted of four sections, and 24 items were developed and personally administered according to the research objectives. All items were designed using the Likert scale to ease the respondents in making their choices. Replies to the questionnaire were collected over two months to regularly alert and monitor sampling responses. To contain COVID-19 diseases, most of the businesses were shut down during the MCO, thus a convenient sampling technique was adopted and a

total of 50 questionnaires were returned satisfactorily. Despite this, only 40 sets of surveys were usable due to ten sets of incomplete surveys. It is worth mentioning that when this report was written, the data collection procedure was still in progress.

A descriptive study that includes mean, standard deviation and percentages for each component in technological infrastructure and digital literacy with respect to the involvement in E-commerce were employed in Perlis during Covid-19. Data were analysed and interpreted by using Statistical Package for Social Science (SPSS) computer software program. Before applying this analysis, the validity and reliability of the research questionnaire were examined using the Cronbach's Alpha values. Table 3 summarises the information of the questionnaire used in this study.

Table 3: Result of Reliability Test: Cronbach's Alpha

Variables	Number of Item	Source	Cronbach's Alpha
Section A : Demographic Profile	7	Designed by researchers	-
Section B : Involvement in E-commerce	6	Designed by researchers	0.717
Section C : Technological Infrastructure	5	Tapscott and Caston (1993)	0.852
Section D : Digital Literacy	6	Kurtz and Peled (2016)	0.867

Demographic Profile of the Respondents

The demographic profile of the participants is summarised in Table 4. Males made up 57.5% of Muslim business owners in Perlis, while females made up 42.5%. Kangar (35%), Arau (17.5%), Chuping (12.5%), and Wang Kelian (12.5%) are the main cities in Perlis where the business is concentrated. A sole proprietorship is the most basic type of business structure in which the owner owns the entire company and is entitled to all earnings (Miller, 2021). Muslim entrepreneurs in Perlis prefer sole proprietorship businesses to partnership and private limited companies due to their simplicity, with 77.5%, 15%, and 7.5%, respectively.

Foods and beverages (45%) is the most popular business sector among Muslim entrepreneurs, followed by clothing (15%), grocery (10%), and suppliers (10%). Homestay and engineering, manufacturing, and construction are the most popular business sectors (5%). In Perlis, the replies were primarily from the second and third sectors of the business. Covid-19 has been in Malaysia for about a year. The development of the epidemic has resulted in around 35% of new Muslim entrepreneurs who have been in business for less than a year. This confirms that the new business owners started their operations during the pandemic.

The variables influencing the rise of Muslim entrepreneurs during the epidemic will be the subject of a new study. About 30% of Muslim entrepreneurs who have been in business for more than five years could continue operating during the pandemic. The majority of Muslim entrepreneurs in Perlis are more focused on their businesses within the state (57.5%) than within the country (32.5%) or in neighbouring states (10%). The entrepreneurs use at most six applications in their business which is equal to 22.5% of respondents.

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Table 4: Demographic Profile of the Respondents

Category	n = 40		Category	n = 40	
	f	%		f	%
Gender	23	57.5%	**Years of Establishment**		
Male	17	42.5%	Below 1 year	14	35%
Female			1 – 3 years	6	15%
			3 – 5 years	8	20%
			More than 5 years	12	30%
Business' Location			**Business' Sector**		
Arau	7	17.5%	Food and Beverages	18	45%
Chuping	5	12.5%	Groceries	4	10%
Kangar	14	35.0%	Clothing	6	15%
Kuala Perlis	4	10%	Laundry and Car Wash	1	2.5%
Padang Besar	2	5%	Supplier	4	10%
Pauh	1	2.5%	Homestay	2	5%
Wang Kelian	1	2.5%	Engineering, Manufacturing, Construction	2	5%
Beseri	4	10%			
Santan	1	2.5%	Financial	1	2.5%
Other Parts of Perlis	1	2.5%	Printing	1	2.5%
			Technology	1	2.5%
Business' Type			**Business Market**		
Private Limited	3	7.5%	Within country	13	32.5%
Partnership	6	15%	Within state	23	57.5%
Sole Proprietorship	31	77.5%	Around the neighbouring state	4	10%
Number of Applications Used in Business					
2	3	7.5%	6	9	22.5%
3	7	17.5%	7	2	5%
4	6	15%	8	4	10%
5	8	20%	9	1	2.5%

*Frequency (f), Percentage (%), Number of sample (n)

Mean, Standard Deviation, and Percentage Analysis

Table 5 depicts the mean and standard deviation values, and Figure 1 shows percentages of each component regarding technological infrastructure. Five items or components were used to assess this variable.

The mean value of all components are from 1.8750 to 2.6750, with the overall mean value is 2.19, and a 0.3998 standard deviation. User involvement and technological awareness are among the highest mean with 2.6750 and 2.5750, respectively, compared to others. About 70% of the respondents agreed with technological awareness and user involvement in technological infrastructure in the participation of SMEs in E-commerce during Covid-19, as shown in Figure 1. Most of the respondents were uncertain with the connectivity, distributed computing, and flexibility in technological infrastructure on the involvement of SMEs in E-commerce during Covid-19, with the percentage of 57.5%, 75%, and 42.5%, respectively as shown in Figure 1. The findings revealed that most respondents had uncertain views on technological infrastructure in the involvement of SMEs in E-commerce during Covid-19.

The mean, standard deviation values, and percentages of each component in digital literacy are shown in Table 6 and Figure 2, respectively.

This variable was assessed using six components. The mean value of all the components are from 2.3750 to 2.7750, and the overall mean value is 2.5958 with a 0.1833 standard deviation. The collection of information, social responsibility, information management, and processing information, are among the highest mean value, with 2.7750, 2.7750, 2.6750, and 2.6000, respectively, compared to others. From Figure 2, we can see that 80% of respondents agree about information management in

digital literacy on the involvement of SMEs in E-commerce during Covid-19. Followed by social responsibility, information management and processing information with the percentage of 77.5%, 72.5% and 62.5% respectively.

In contrast, the mean for evaluation of information and integrity awareness is 2.3750. About 47.5% and 57.5% of respondents from evaluation of information and integrity awareness in digital literacy are uncertain. The findings show that most respondents agreed about the role of digital literacy in the involvement of SMEs in E-commerce during Covid-19.

Table 5: Technological Infrastructure

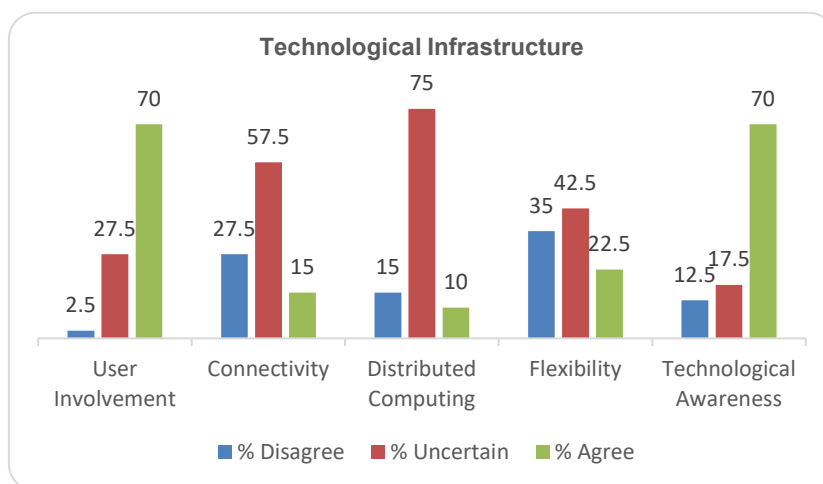| Components of Technological Infrastructure	Mean	Standard Deviation
User involvement	2.6750	0.5256
Connectivity	1.8750	0.6480
Distributed computing	1.9500	0.4038
Flexibility	1.8750	0.7574
Technological awareness	2.5750	0.7121
Overall Value	2.1900	0.3998

Figure 1: Percentage Components of Technological Infrastructure

Table 6: Digital Literacy

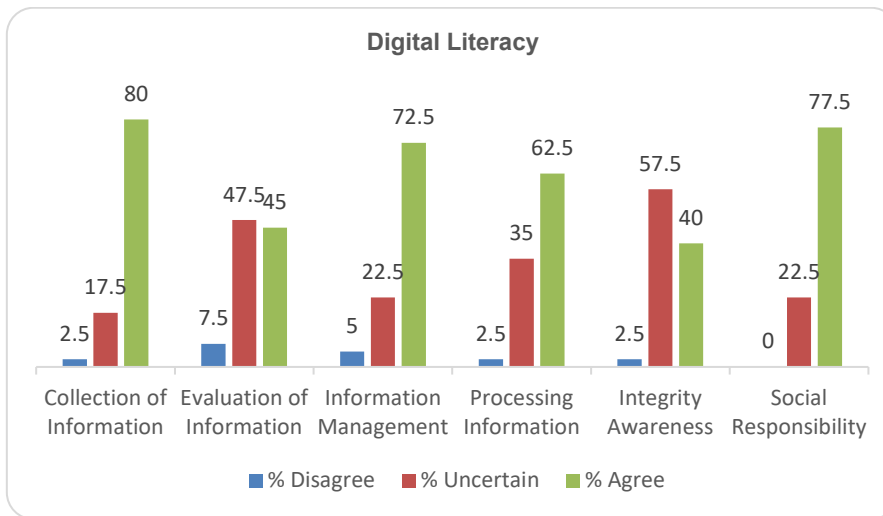| Components of Digital Literacy	Mean	Standard Deviation
Collection of Information	2.7750	0.4797
Evaluation of Information	2.3750	0.6279
Information Management	2.6750	0.5723
Processing Information	2.6000	0.5454
Integrity Awareness	2.3750	0.5401
Social Responsibility	2.7750	0.4290
Overall Value	2.5958	0.1833

Figure 2: Percentage Components of Digital Literacy

Discussion

Based on Table 5, the overall mean of technological infrastructure is 2.19, with a 0.3998 standard deviation. Findings revealed that most respondents had uncertain views on technological infrastructure in the involvement of SMEs in E-commerce in Perlis during Covid-19. Connectivity, distributed computing, and flexibility in technological infrastructure contribute to the highest percentage of respondents who are not sure about the involvement of SMEs in Perlis during Covid-19. A study by Candra and Ashari (2014) claim that having to bear the high cost of connectivity and services provided by telecommunication services in rural and least developed makes the entrepreneurs unable to operate online and sustain their business. Hence, the unsure result implies that the authority in Perlis should improve telecommunication services focusing on connectivity to encourage the SMEs' participation in E-commerce as they need to be more communicative, be able to apply distributed computing, and be more flexible during the outbreak.

Results in Table 6 show that digital literacy is 2.5958 and the standard deviation of 0.1833. The results show that most respondents agreed about digital literacy in the involvement of SMEs in E-commerce in Perlis during Covid-19. This finding can be supported by the research conducted by Sariwulan et al. (2020), which stated that digital literacy has the most significant influence on SMEs in E-commerce, both directly or indirectly. Revathi and Sathya (2020) also claimed that digital literacy is crucial to compete in the global digital market and provide a more ample opportunity for entrepreneurs. Collection of information, information management, processing information, and social responsibility in digital literacy plays an essential role in the involvement of SMEs in Perlis during Covid-19 as the percentage of respondents who agreed is highest among another component. The results imply that the entrepreneur in Perlis can utilise the digital-related knowledge to collect, manage, and process the information received from digital devices, plus having social responsibility in the digital world.

CONCLUSION

This study descriptively presented the factors of the involvement of SMEs in E-commerce in Perlis during Covid-19, which are technological infrastructure and digital literacy. Generally, most of the respondents have an uncertain view of technological infrastructure. Still, most of them agreed that digital literacy did play an essential role in the involvement of SMEs in E-commerce in Perlis during Covid-19. The findings demonstrate that Muslim entrepreneurs in SMEs are digitally literate. However,

the lack of technological infrastructure appears to be the factor limiting their participation in E-commerce.

Technological infrastructure such as connectivity especially in terms of network services is one of the fundamental things today, but if the connectivity of network service is still weak, the use of any device or having digital knowledge is not meaningful especially to those involved in E-commerce.

We hope that this study is helpful to local SMEs to identify the critical elements that they need to improve to expand their business. This research is also intended to aid local governments in providing required facilities to local SMEs by utilising e-commerce as one of the economic activity enhancers.

There are certain limitations to this paper. This study applied descriptive analysis in mean, standard deviation, and percentages on each component in each factor only. Thus, we aim to broaden the types of analyses, for instance, performing inferential analysis including correlation and regression analysis to dig up more detailed information on the collected data. It is worth mentioning that when this report was written, the data collection procedure was still in progress. Therefore, future research using more extensive samples should be conducted.

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AUTHORS' CONTRIBUTION

Mohd Zaki Shabuddin. and Izwan Nurli Mat Bistaman conceived and planned the experiments. Rozana Mohd Jamil carried out the experiments, data collection and data preparation. Fatimah Noni Muhamad involved in the interpretation of the results. Nor Izham Subri and Mohd Zaki Shahabuddin took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis and manuscript.

CONFLICT OF INTEREST DECLARATION

We certify that the article is the Authors' and Co-Authors' original work. The article has not received prior publication and is not under consideration for publication elsewhere. This research/manuscript has not been submitted for publication nor has it been published in whole or in part elsewhere. We testify to the fact that all Authors have contributed significantly to the work, validity and legitimacy of the data and its interpretation for submission to Jurnal Intelek.

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