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Digital Transformation in Mses: A Story from Indonesia

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ABSTRACT: The emergence of digital technology (DT) or information and communication technology (ICT) has created a drastic change in business practices which presents a serious challenge to the success of the implementation of the inclusive development strategy in Indonesia. This chapter discusses how the digitalization process occurs in micro and small enterprises (MSEs) in Indonesia and what are the main challenges faced by this business group. The study that underlies this chapter focuses on MSEs in the manufacturing industry in Indonesia. It shows that only a very small number of MSEs utilize digital technology, especially e-commerce for marketing, although the percentage varies by industry group. There are some causes, including a lack of insight or knowledge about the importance of digital technology especially in facing competition, limited capital, lack of ICT infrastructure in their area, and entrepreneurs think no need to use the Internet or e-commerce because they only sell their goods in the local market in small amounts.

KEYWORDS: MSEs, MSMEs, MIEs, ICT, manufacturing, digital economy, internet

INTRODUCTION

It is undeniable that information and communication technology (ICT) has changed many things in the business. It not only has changed the way businesses communicate with each other or deal with their customers, distributors, and suppliers but also through digital marketing or e-commerce it has changed the way they promote and sell their products or purchase their raw materials. Digital Marketing has now become the trend in targeting both current and prospective customers. Most people now have daily access to the Internet via computer, laptop, or smartphone. Social media is one of the best channels of online marketing, and Instagram is one of the fastest-growing platforms available today (Balakrishnan and Boorstin, 2017). More and more businesses are eager to establish a strong presence on this network and encourage their prospects' engagement.

However, evidence from many studies shows that the implementation of Internet technologies in small and especially micro-businesses has been slow. Many micro and small enterprises (MSEs) resist using Internet technologies and instead continue to use printed materials to market themselves and use more traditional means to search for information and communicate with others. Many MSEs are unlikely to adopt sophisticated Internet technologies if they are not familiar with more basic ones. But, as for all other companies, MSEs have no other options than to adopt this technology if they want to survive. Sooner or later, MSEs which do not adopt this new technology and business practice will be displaced by their competitors and abandoned by their customers (e.g. Ahmada et al., 2015; Ocha (2011), Azam and Quaddus, 2009a,b; Barry and Milner, 2002).

Governments in many countries have given considerable attention to the utilization of ICT, particularly the adoption of e-commerce, by micro, small and medium enterprises (MSMEs) by issuing policies and regulations to assist them to adopt this technology. In Indonesia, in the past few years, the government has taken many measures to encourage or support MSMEs to use ICT in running their business. The measures include providing training for MSMEs in utilizing such as Facebook, Instagram, and other application systems, and to create their websites to promote and market their goods and services; creating a special web portal (SMESCO Trade) by the Ministry of Cooperatives and Small Medium Enterprise (SME) that all MSMEs can use it for marketing their products; and issuing various regulations to provide a sense of security for business actors in utilizing ICT such as e-commerce for marketing and internet banking for financial transactions.

Given the above background, a study on which this paper is based was conducted to explore the use of the Internet by micro and small enterprises (MSEs) in Indonesia. More specifically, the study aims to address the following two research questions. First, how many MSEs in Indonesia use the Internet for their businesses? Second, what main challenges for the digital transformation in MSEs in Indonesia

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Development of Digital Economy

In the last few years, the use of ICT in Indonesia showed rapid development. The emergence of this technology has created a drastic change in business practices which presents a serious challenge to the success of the implementation of the inclusive development strategy in Indonesia. Simply because digital technology (DT) has given birth to new business models that encourage higher economic growth and increase per capita income more rapidly. The most important indicator of the digital economy phenomenon is the level of internet usage.

Data from BPS and the Ministry of Communication and Information (Kemkominfo) (BPS. 2019, 2020a, 2021a) show in 2018 internet penetration (IP) in Indonesia grew rapidly, from 21.98 in 2015 to 53.73 2020 per 100 people. Meanwhile, in terms of IP by households (HHs), 78.17 percent of HHs have access to the internet in 2020, an increase from 41.98 percent in 2015 (Figure 1). This growth of household internet users was in line with the growth of inhabitants using cellular phones from 2016 to 2020, reaching 62.84 percent. In 2020, there was 89.09 percent of households in Indonesia owned/used at least one active cell phone number. This number has increased compared to 2015 with only 88.04 percent.

Computer ownership is an indicator of ICT usage. HH's computer ownership continues to increase every year. In 2020, the percentage of HHs that owned computers reached 18.83 percent, compared to only 14.86 percent in 2012, although the percentage varied by region (Table 1). During the period 2012-2020, computer ownership in HHs grew about 0.50 percent per year (BPS, 2021a). No doubt that this development can encourage the development of internet use in economic and financial activities or the digital economy phenomenon.

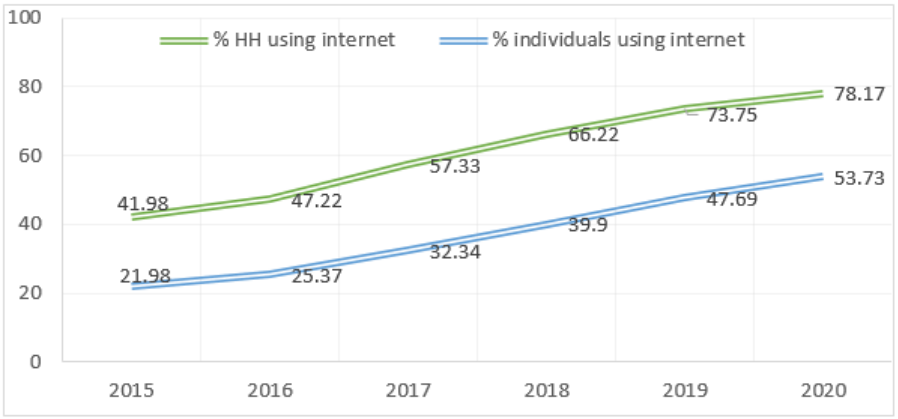


Figure 1. Percentages of HHs and Individuals Using the Internet, 2015-2020 (%)
Source: BPS (2020a, 2021a).

Table 1. Percentage of HHs Owning/Using Computer by Region, 2012-2020

	Urban	Rural	National
2012	24.54	5.61	14.86
2013	24.98	6.33	15.61
2014	27.33	7.34	17.3
2015	28.6	8.74	18.71
2016	28.5	9.24	19.14
2017	27.88	9.18	19.11
2018	28.43	9.93	20.05
2019	26.11	9.45	18.78
2020	26.09	9.58	18.83

Source: BPS (2021a)

Further, based on data from the Socio-economic National Survey (SUSENAS), computer penetration in Indonesia is still low, although the trend increased yearly. Table 2 shows the distribution of HH computer ownership in Indonesia according to the island. As can be seen, the highest percentage of HHs that owned a computer in 2019 and 2020 was in Kalimantan Island, which

amounted to 22.57 percent and 21.27 percent, respectively. Meanwhile, Maluku and Papua islands had the lowest computer ownership percentage, respectively, at 15.52 and 15.93 percent.

Table 2. Percentage of HHs Owning/Using Computer by Island, 2019 and 2020

	2019	2020
Sumatera	16.82	16.94
Java	19.14	19.41
Kalimantan	22.57	21.27
Sulawesi	21.03	19.94
Bali & Nusa Tenggara	16.91	16.95
Maluku & Papua	15.52	15.93

Source: BPS (2021a)

The e-commerce phenomenon is probably the most important indicator of the development of the digital economy. In 2018, BPS published statistics on the use and utilization of ICT in the business sector based on the results of a survey of 4,537 companies spread across 34 provinces, covering 129 districts/cities in Indonesia in 2017 (BPS, 2018b). The scope of the survey covers five main activities, namely the manufacturing sector, trade, the provision of accommodation, the provision of food and beverage, and the information and communication sector.

The survey results show that the network facilities owned by the companies surveyed vary, ranging from the internet, intranet, local area network (LAN), and extranet. Most of the respondents have the internet as their network facility, namely 69.53 percent. Meanwhile, companies that have an intranet, LAN, and extranet facilities are respectively 48.00 percent, 56.13 percent, and 16.80 percent of the total respondents.

In terms of types of internet access, internet connections are divided into 4 types, namely fixed narrowband, fixed broadband, mobile broadband, and satellite antenna (VSAT). Of the total companies surveyed using the internet, those using fixed narrowband access were 10.25 percent, fixed broadband 71.44 percent, mobile broadband 24.66 percent, and VSAT 7.70 percent.

For the main indicators describing e-commerce, BPS in its survey of 4,537 companies spread across 34 provinces, covering 129 districts/cities in Indonesia in 2017 (BPS, 2018b) used the proportion of companies that receive orders/make sales via the internet and the proportion of companies that make orders/purchase goods/services via the internet. The result presented in Table 3 shows that as many as 28.78 percent of companies in the sample have received orders/made sales via the internet, and the proportion of companies that have ordered/ purchased goods/services via the internet is 24.49 percent. It also shows that the proportions of making sales and placing orders via the internet vary by sector.

Table 3. Percentage of Companies that Make Sales and Purchases through the Internet by Main Sector, 2017

Sector	Sale	Purchase
Manufacturing industry	30.34	31.28
Trade	25.61	23.15
Accommodation provision	49.69	21.96
Food and drink preparation	37.80	15.36
Information and communication	30.69	39.46
Business sector	28.78	24.49

Source: BPS (2018b).

Another important finding from this survey is the purpose of using the internet, as shown in Table 4, the largest proportion of internet use is for sending and receiving e-mail (85.92 percent), followed by looking for information about goods and services (71.57 percent), and for using instant services (64.93 percent).

Table 4. Percentage of Companies by the Purpose of Using the Internet, 2017

Purpose	Proportion
Sending & receiving email	85.92
Looking for information about goods and services	71.57

Using instant services	64.93
Banking transactions	54.80
Social media	54.47
Looking for information about government institutions	44.79

Source: BPS (2018b).

Covid-19 has brought humanity around the world into an unprecedented phase of isolation. Various efforts were made including social restrictions which were considered the most effective in slowing the spread of the virus until the discovery of a Covid-19 control vaccine. This forced business managers including MSMEs to transform their business into digital form and to adopt e-commerce to market their products if they wanted to survive. On the other side, the Covid-19 pandemic crisis has also pushed households or consumers to purchase online all their necessities as much as possible. Figures 2 and 3 show that the use of e-commerce in Indonesia has experienced significant growth during 2020.

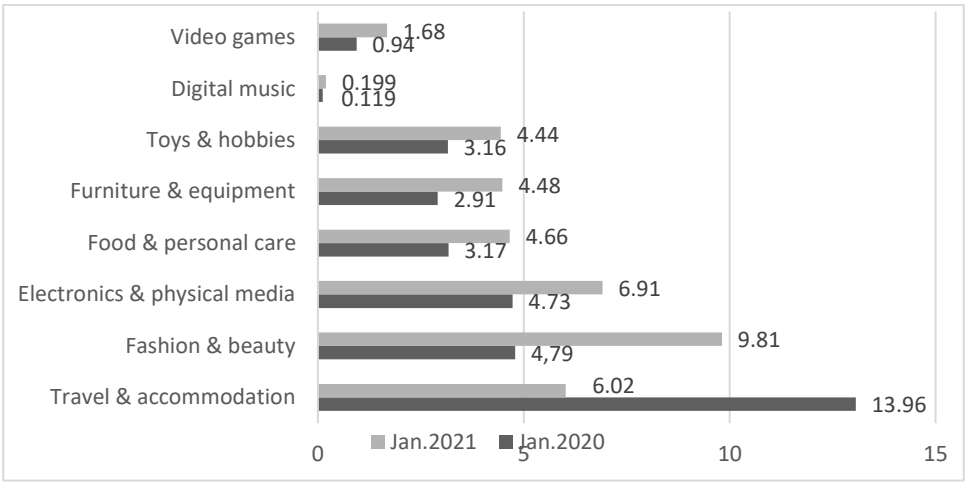


Figure 2. Total E-commerce Shopping in Indonesia, January 2020-January 2021 (bill. USD)
Source: Kompas (2021a)

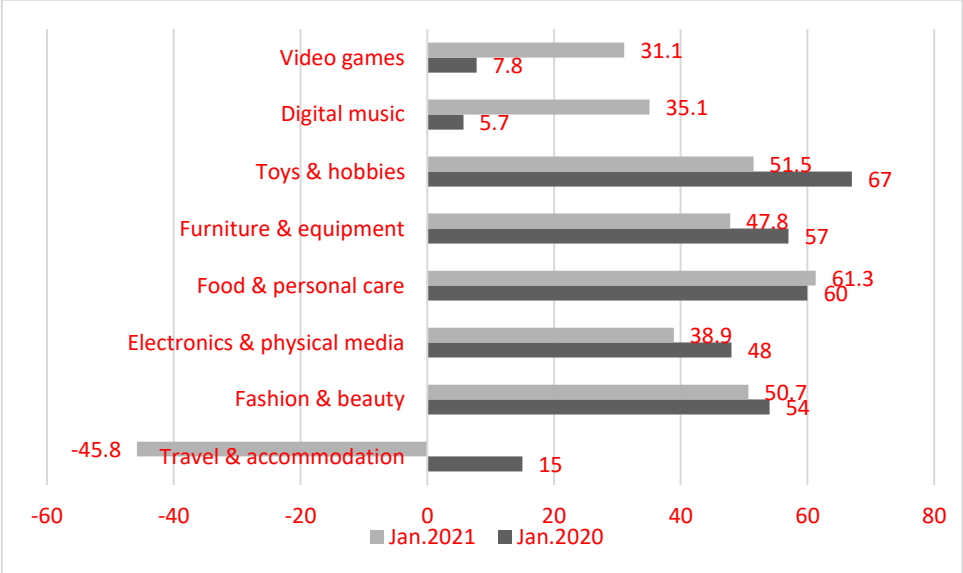


Figure 3. Growth of E-commerce in Indonesia, January 2020-January 2021 (%)
Source: Kompas (2021a)

Data from the Ministry of Cooperatives and SMEs show that because of Covid-19, around 2 million MSMEs entered digital platforms. Meanwhile, the results of a survey conducted by the United Nations Development Program (UNDP) in collaboration with the University of Indonesia found that around 44 percent of respondents joined e-commerce sites during the pandemic. Most of the respondents admitted that at first, it was hard and difficult to learn and use digital facilities, but now they are familiar with this technology (Kompas, 2021b).

Data from Indonesia's central bank, Bank Indonesia (BI), suggests that the digital economy and finance In Indonesia will be more vibrant. BI projects that electronic trade transactions in 2021 will increase by 33.2 percent annually to IDR 337 trillion. An increase is also predicted to occur in digital banking transactions by 19.1 percent annually during the same period. Meanwhile, the use of electronic money will grow by 32.3 percent (Kompas, 2021c).

In the context of mapping e-commerce in Indonesia, BPS collected data on e-commerce in 2019 based on HH and company businesses to obtain an overview of the development of e-commerce businesses in Indonesia, from the perspective of business owners. The sample survey consisted of 17,063 companies in all provinces, covering 101 districts/cities, throughout Indonesia. It shows that most of the companies surveyed (90.18%) sold goods/services through the internet during 2020 (up to 31 August); although the ratio between using and not using e-commerce varies between provinces. Many factors can explain this, including access to ICT or internet infrastructure (especially broadband access in rural areas); the respondent's location (whether in a remote village or a city); market conditions (e.g., market size, competition) served by the respondent; or personal reasons such as preferring to sell directly (offline), not interested in selling online, or lack of knowledge or expertise in e-commerce about selling online. Nearly half of the companies surveyed using e-commerce (48.42 percent) are in the wholesale and retail trade, car and motorcycle repair, and maintenance sectors (BPS, 2020c).

In 2020 BPS (2021b) continued to collect data on e-commerce. Some of the important things obtained from the results of the survey data collection include:

1) up to December 31, 2021, about 25.25 percent of the surveyed companies were carrying out e-commerce activities, while up to June 30, 2021, it was recorded at 25.92 percent. This shows that although there is an increase, businesses that received orders or sold goods/services via the internet in Indonesia were still relatively low, and were dominated by conventional types of business,

2) a total of 1.774.589 e-commerce businesses or 75.15 percent of the total e-commerce businesses in Indonesia (2.361.423 businesses) were concentrated in Java Island, the most developed region in the country. This phenomenon of course related to the region located close to the center of the economy and the availability of business support facilities such as adequate internet access (Table 5),

Table 5. Number and Percentage of E-Commerce Companies, 2021

	Total e-commerce	%
Aceh	18.393	0.78
North Sumatera	73.092	3.10
West Sumatera	26.082	1.10
Riau	25.577	1.08
Jambi	20.215	0.86
South Sumatera	28.746	1.22
Bengkulu	20.988	0.89
Lampung	47.559	2.01
Bangka Belitung	9.536	0.40
Kep. Riau	20.533	0.87
DKI Jakarta	218.582	9.26
West Java	473.283	20.05
Central Java	406.911	17.23
DI Yogyakarta	147.781	6.26
East Java	467.996	19.82
Banten	60.036	2.54
Bali	67.589	2.86
West Nusa Tenggara	25.281	1.07
East Nusa Tenggara	10.297	0.44
West Kalimantan	17.939	0.76
Central Kalimantan	12.403	0.53
South Kalimantan	24.972	1.06

East Kalimantan	38.483	1.63
North Kalimantan	5.535	0.23
North Sulawesi	12.133	0.51
Central Sulawesi	10.226	0.43
South Sulawesi	42.367	1.79
Southeast Sulawesi	10.021	0.42
Gorontalo	4.777	0.20
West Sulawesi	4.047	0.17
Maluku	3.518	0.15
North Maluku	1.817	0.08
West Papua	1.685	0.07
Papua	3.023	0.13
Indonesia	2.361.423	100.00

Source: BPS (2021b).

3) most of the age of the person in charge/owner of the e-commerce business was in the range of 35-44 years (33.07 percent) and 25-34 years (24.79 percent). This phenomenon indicates that the person in charge/owner of the e-commerce business was mostly the millennial generation who interact a lot with the rapid development of technology, including e-commerce,

4) the majority of education responsible for/owner of e-commerce business is a high school/vocational high school (SMA/SMK) and below (75.36 percent), followed by 17.22 percent with Diploma IV/S1 education. The majority of e-commerce business owners with high school/vocational education or lower were found in the trade sector, while e-commerce businesses with between 20 to 99 employees, or more than 100 people are led by educated people with Diploma IV/S1,

5) of the entire scope of businesses that use the internet, businesses belonging to category G (wholesale and retail trade, repair and maintenance of cars and motorcycles) dominated e-commerce activities, with a percentage of almost half of the total business (i.e. 46.05 percent). The second-largest e-commerce business activity (17.10 percent) comes from category c (processing industry). Meanwhile, the businesses included in category I (accommodation and food and drink provision) were the third-largest e-commerce businesses with a percentage of 15.81 percent,

6) when compared between the year it started operating and the year it started doing e-commerce activities, it shows that 50.71 percent of businesses directly conduct e-commerce activities when they just started operating. About 15.98 percent of new businesses started e-commerce activities 1-2 years after operating, 11.27 percent of businesses just started e-commerce activities after 3-5 years of operation, and 22.04 percent of businesses just started more than 5 years after opening business operations,

7) in the e-commerce business, there are several sales models, namely a seller (seller), a reseller (reseller), as well as an intermediary between sellers and buyers (drop shippers).In 2020, the sales model in e-commerce was dominated by sellers (sellers) at 79.91 percent, followed by resellers (resellers) as much as 13.09 percent, and the smallest was an intermediary between sellers and buyers with a total of 7.00 percent,

8) more than half (54.66 percent) of e-commerce businesses sold online through social media, such as Facebook, Instagram, Twitter, and so on. Furthermore, only 21.64 percent of businesses have sales accounts
on digital marketplaces/platforms. So, it means that 78.36 percent of e-commerce businesses have not utilized this sales media. Furthermore, there was 10.42 percent of businesses used e-mail in selling online. In the final order, there were 2.38 percent of businesses that used the website,

9) more than half of e-commerce businesses in Indonesia or 63.76 percent sent their products directly to buyers. A total of 21.54 percent of e-commerce businesses have chosen a shipping method by which buyers pick up orders directly at stores or certain pick-up points. Only 1.85 percent of e-commerce businesses export trade, while import activities were only carried out by 1.38 percent of e-commerce businesses, and

10) about 8 percent of the e-commerce businesses have received training related to the use of information technology for digital marketing. Most of them received training from the private sector (77.24 percent). Meanwhile, only 25.36 percent of businesses claimed to have received training from government agencies. Judging from the level of training, most of the e-commerce businesses attended training related to the use of information technology at the basic level, namely 69.27 percent.

Finally, the 2016 Economic Census shows that the types of businesses that most MSEs utilize the internet are retail trade and car and motorcycle repair and care services with around 39.64 percent (Figure 4). Especially in the retail trade, the use of online

transactions by both consumers (buying) and producers (selling) in Indonesia has grown tremendously in recent years. This development is also encouraging or even forcing more and more MSEs in this sector to utilize the internet, both in the form of using existing marketing websites and creating their websites. Other types of businesses that are also run by many MSEs by utilizing the internet are information and communication with 11.73 per cent, the manufacturing industry with 10.66 per cent, and education with 8.09 per cent. Meanwhile, the least types of businesses carried out by MSEs that utilize the internet are real estate business and human health and social activities. Only about 0.56 percent of total MSEs in the real estate sector utilize the internet, and in human health and social activities, it is only 1.30 percent. The low percentages do not show low internet utilization rates of MSEs in these two sectors but mainly because of the low number of MSEs in both categories of businesses, especially when compared to the number of MSEs in the trade sector.

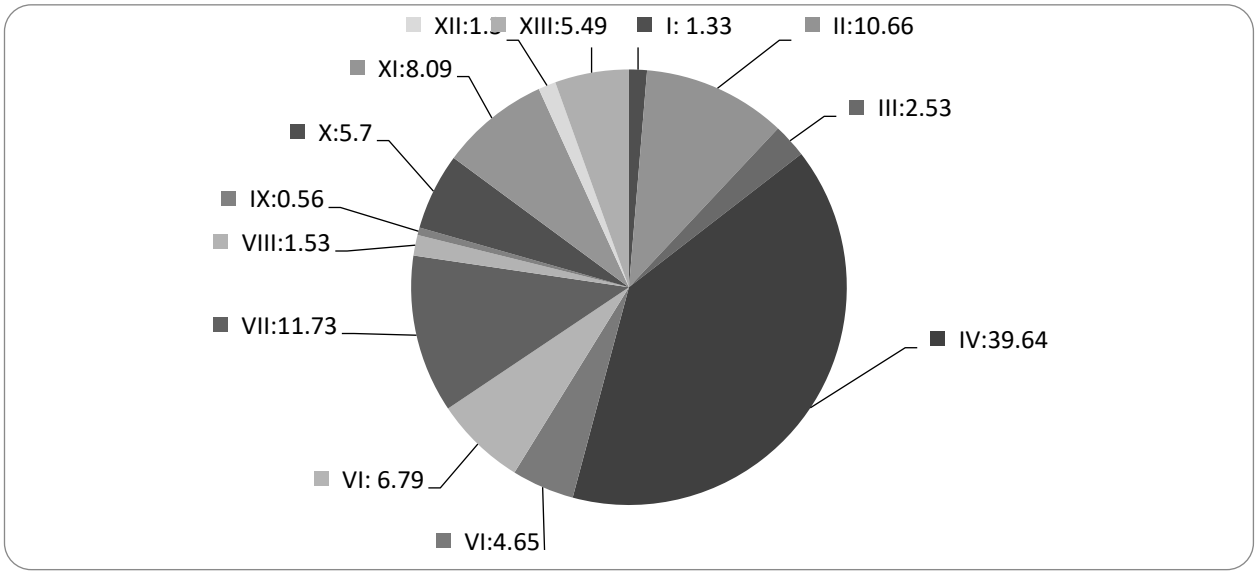


Figure 4. Distribution of MSEs in Indonesia Using the Internet by Type of Business

Notes: I: Mining and quarrying; procurement of electricity, gas, and drinking water; water management, wastewater management, waste management, recycling, and remediation activities; II: manufacturing industry; III: construction; IV: retail trade, and car and motorcycle reparation and maintenance; V: transportation and warehouse; VI: accommodation and food and beverages; VII: information and communication; VIII: finance and insurance; IX: real estate; X: business services; XII: education; healthcare and social activities; XIII: other services.
Source: BPS (2017).

Factors Affecting the DT Adoption of MSMEs

As the competition faced by MSMEs becomes increasingly tight, these enterprises use modern technologies, including DT as among their sources of competitive advantages. There are many indications from various sources that in the past decade more and more MSMEs utilised DT or adopted e-commerce; although still many more MSMEs, especially MIEs, do not/have not (yet) utilised this technology in running their business activities for various reasons. With this development, Internet use, especially e-commerce, among these enterprises has recently become a popular topic for researchers not only in the fields of MSMEs but also in electronic business, information management, information systems, and entrepreneurship; though research investigating the adoption of e-commerce by MSMEs is still small in number. Some of these studies also made a good summary of the findings from previous studies.

The literature can be grouped into two categories, namely studies that focus on the main factors that influence the decision of MSMEs to utilize DT or the Internet, and studies that give more attention to the benefit of utilising DT and applications to support their business activities. From the first group (determinant factors), recent articles are including from Blackburn and Athayde (2000), Fallon and Moran (2000), Matlay (2000), and Riquelme (2002) who conclude that type of business or sector and size and characteristics of enterprises are the most decisive factors for a company to use the Internet. Others such as Poon and Swatman (2005), Chong and Pervan (2007), Shih (2008), Poorangi and Khin (2013), Ahmada, et al. (2015), and Rahayu and Day (2015) mention many factors that have strong influences a company's decision to utilize the internet or to adopt e-commerce in selling their products, which include perceived relative advantage, organisational compatibility, and benefits; firm owner's or manager's strategic vision; a company's level of innovativeness; DT knowledge, expertise, experience, and willingness of company leaders or managers to utilize DT as well as to adjust the way they do businesses to the requirements related to the utilisation of

DT; business planning; organisational complexity; government policies; availability of skilled labor in DT and software/hardware vendors; and pressures from trading partners, customers and competitors.

Neale, et al. (2006), Saffu, et al. (2008), Azam and Quaddus (2009b), and Poorangi, et al. (2013) found that besides perceived organisational compatibility, relative advantages and organisational complexity, trialability, observability, and company's culture are also important determinant factors of e-commerce adoption by small businesses. Whereas, studies conducted by such as Migiro (2006), Jones, et al. (2011), and Zaied (2012), reveal that resources, i.e. capital to finance-related costs (e.g. training of employees, organizational change, investment in tools, and others), and human resources, especially technical know-how/expertise; and internet security or trust to use online transactions are the main decisive factors for a company to utilise the Internet in marketing its products and purchasing raw materials.

In Indonesia, from their survey finding of more than 200 owners/managers of MSMEs, Rahayua and Daya (2015) conclude that the adoption of e-commerce by MSMEs is affected by several factors which include perceived benefits, technology readiness, owners' innovativeness, owners' DT experience, and owners' DT ability. Their findings also show that the individual factors play a significant role in the adoption of e-commerce technology by MSMEs in Indonesia. In their study, MSMEs refer to a business that has less than 100 employees, assets less than 10 billion rupiah, and total sales per year below 50 billion rupiahs. Based on their finding.

Media Indonesia, a newspaper, discussed several research reports from various research institutes in Jakarta regarding the penetration of DT in MSMEs. Delloite Access Economics, among the reports, shows that around 36% of MSMEs in Indonesia still use conventional marketing methods and only 18% of MSMEs can use social media and websites to promote their products. According to this report, low technological knowledge and an unskilled workforce are considered obstacles to digitizing MSMEs. The Center for Indonesian Policy Studies (CIPS) shows that as many as 37% of MSMEs are recorded as only being able to operate computers and the internet in a simple way. The report confirms that digitalization can be accelerated if the competent authorities work together to provide and ensure sustainable and affordable internet connectivity. Meanwhile, the Danareksa Research Institute shows that around 41.67% of MSMEs in DKI Jakarta are already using social media and digital marketing in their activities. business operations. Meanwhile, only 29.18% of MSMEs in Java Island and 16.16% of MSMEs outside Java Island have utilized digital marketing (https://mediaindonesia.com/ekonomi/403910/literasi-digtal-umkm-jadi-kendala-dalam-transformasi-digital).

From the second group (benefits), according to such as Daniel, et al. (2002), Migiro (2006), Lai (2007), Azam and Quaddus (2009a), Hunaiti, et al. (2009), Standing, et al. (2010), Farhad, et al. (2011), and Savrula, et al. (2014), using the Internet provides benefits for companies in various forms such as improves productivity, efficiency, and competitiveness; increases the ability to operate in international markets; provides a tool for providing cost-effective ways to market their products and launch new products; streamlining of business processes; market expansion; and creates value-added, new services and new business models. By using the internet, a company also improves or accelerates its communications with suppliers, distributors, trading partners, consumers, creditors, and others. It also gathers information and identifies potential business partners, new suppliers, and new customers easier and faster. Additionally, others such as Neale, et al. (2006), and Poorangi, et al. (2013) found that using the internet also provides internal and external process integration; makes closer relationships with customers, suppliers, trading partners, and other important stakeholders; and increases the expertise for growth and development of business.

From discussions in the literature, it can thus be formulated that the willingness or ability of MSMEs to adopt DT is influenced by many factors in a complex combination. These factors can be distinguished between demand-side factors and supply-side factors. Demand-side factors are from the company side so can be considered internal factors. These factors can be distinguished further into two categories, i.e. personal factors from the owner or manager and company factors. While the supply-side factors are external factors consisting of supporting factors, policy factors, and market factors. The main important elements of each of these factors are shown in Figure 5.

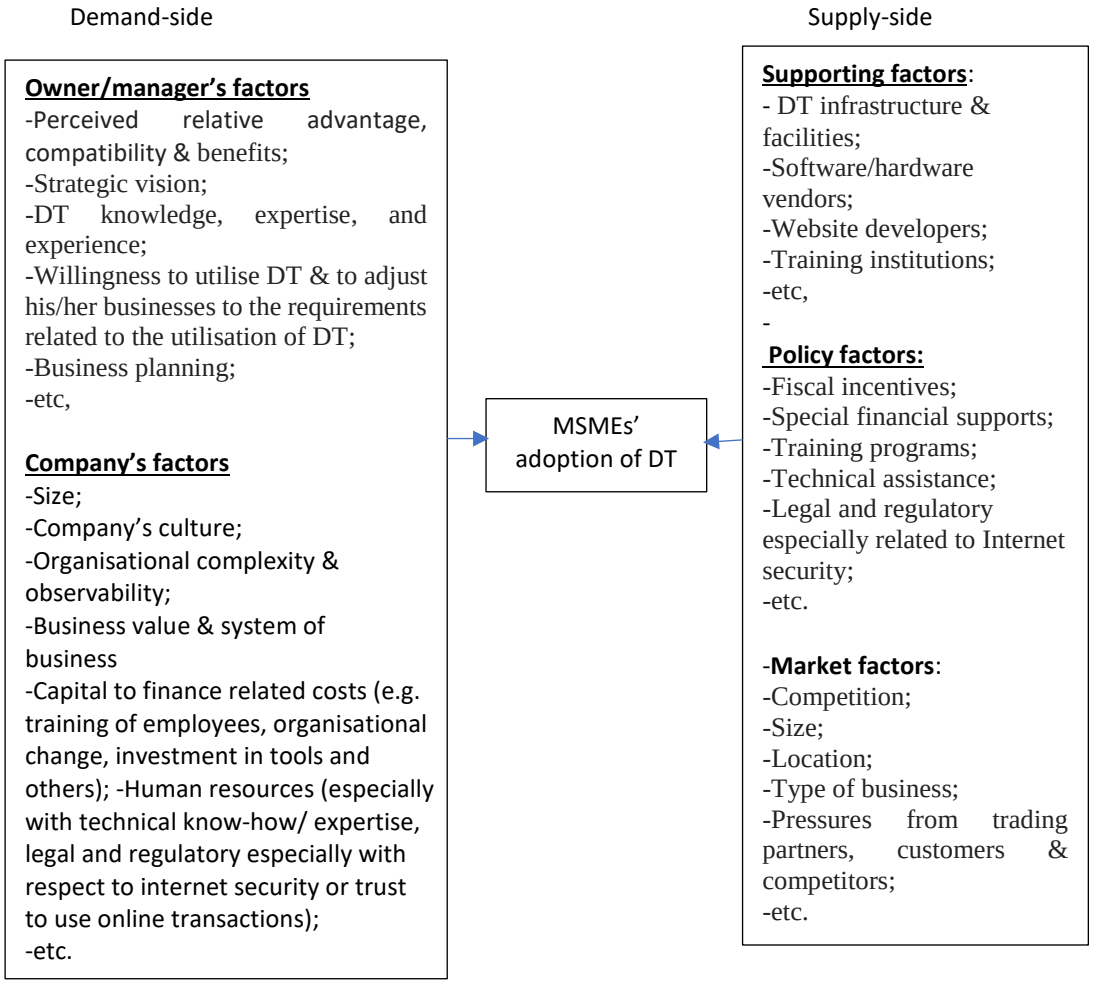


Figure 5. Main Factors Affecting Directly the Willingness or Ability of MSMEs to Adopt DT

But the literature that examined or discussed these factors does not pay attention to the difference in the degree of internet or DT usage by MSMEs between regions (e.g. countries or provinces within a country). Meanwhile, many other studies that used using the concept of the "digital divide" (DD) have examined the gap between individuals, companies, regions, and countries in accessing and using DT. Important studies on this DD include Viswanathan and Pick (2005), Arendt (2008), Fong (2009), Stiakakis et al (2009), Oliveira and Martins (2010), Srinuan and Bohlin (2011), and Bach et al. (2013).

The DD is nowadays evolving to digital inequality, i.e., the socio-economic disparities inside the 'online population'. Srinuan and Bohlin (2011) presented a literature review and classification scheme for DD research. The review covered journal articles published between 2001 and 2010. The results showed that the DD is a multifaceted phenomenon, due to the many dimensions of determinant factors. Recent studies covered by their review have included socio-economic, institutional, and physiological factors to gain a greater understanding of the digital divide. Stiakakis et al (2009) examined two main dimensions of digital inequality, namely 'skills' and 'autonomy' of Internet users. The level of formal education was selected as a representative variable for the skill dimension, as well as the density of population in different geographical areas as a representative variable for the autonomy dimension. The research was focused on the member states of the European Union (EU). The data, provided by Eurostat, included the daily use of computers for the last three months and the average use of the Internet at least once per week. The findings indicate that the EU already faces the problem of digital inequality to an extended degree since there are significant disparities among the European countries about the aforementioned variables. Whereas, Fong (2009) assessed the impact of DTs on Gross National Income (GNI) per capita in developing countries using data from 2005. Her regression analysis showed a significant relationship between GNI per capita (in PPP international dollars) and adoption of each DT (mobile phone, personal computer, and telephone), except for Internet technology. Thus, based on this DD literature, in addition to the factors mentioned in Figure 6, socio-economic factors also play a role in influencing the rate of adoption of DT by MSMEs maybe not directly but through their effects on market development especially market size, structure, and level of competition (Figure 6).

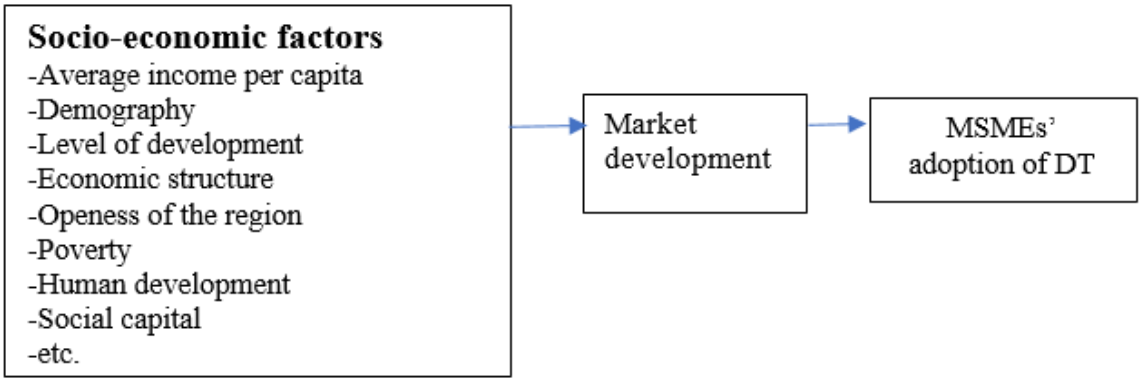


Figure 6. Socio-economic Factors Affecting Indirectly the Willingness of MSMEs to Adopt DT

Internet Usage by MSEs in the Manufacturing Industry

MSEs consist of microenterprises (MIEs) and small enterprises (SEs). In terms of the number of workers, MIEs employ less than five (5) full-time equivalent employees; SEs are enterprises with 5 to 19 workers; medium enterprises (MEs) are those with 20 to 50 employees more. In terms of monetary, MIEs are those with assets less than 50 million or sales of less than 300 million Indonesian rupiahs (IDR) (or with an average exchange rate in 2020, approximately 3.571 and 21.438 US$, respectively); SEs with assets of 50-500 million or sales 300 million – 2.5 billion IDR (3.571-35.714 and 21.438-178.571 US$ respectively).

The data from the State Ministry of Cooperatives and SMEs (Menegkop & UKM) as well as the Central Statistics Agency (BPS) showed that there were approximately 39.765 million MSEs and MEs (medium enterprises (which represents 99.8 percent of the total business establishments in Indonesia in 1997. The number was observed to be growing every year except in 1998 when the Asian financial crisis of the 1997-98 period hit Indonesia which caused the Indonesian rupiah (IDR) exchange rate to depreciate against the United States dollar (USD) by more than 200 percent. This forced several domestic companies out of business while some others reduced their production volume due to various reasons such as the high cost of foreign debt (loan repayment plus interest) in rupiah, high domestic inflation, high-interest rates on the domestic money market which, along with many domestic banks experiencing financial difficulties due to bad debts and losses in USD trading, made it difficult for domestic businesses to obtain credit at the time, and high import prices for raw materials and other production inputs in rupiah.

The crisis also caused the national economy to experience the biggest recession in Indonesian history since the 1945 independence and even the Dutch colonial period as indicated by a negative GDP rate of 13 percent. The number of MSMEs at the time reduced to approximately 36.8 million units which is a 7.42 percent reduction. Moreover, Menegkop & UKM estimated that nearly 3 million MSEs stopped doing business during the crisis while the MEs and LEs that closed down were estimated to be 4.2 percent and 12.7 percent, respectively, of the total enterprises (Tambunan, 2019). However, when the national economy began to recover in 1999, the number of MSMEs started growing again to 37.9 million units which is an increase of 2.98 percent and the growth continued afterward.

Table 6 shows the number of MSMEs was nearly 61.7 million companies which are approximately 99 percent of the total business units in Indonesia in 2016 and the number increased to slightly more than 65 million in 2019. The MIEs are dominant in the MSME sector with approximately 98 percent while the SE portion is only about 1 percent and MEs are even less than that. This means the discussion of Indonesian MSMEs is usually concerning MIEs.

Table 6. Number of MSMEs and Their Workers by Sub-Category in Indonesia, 2016-2019

Description	unit of measure	2018		2019	
		Total	Share (%)	Total	Share (%)
MSMEs	Unit	64,194,057	99.99	65.465.497	99.99
Les		5,550	0.01	5.637	0.01
Total companies		64,199,607	100,00	65.471.134	100.00
MSMEs	People	116,978,631	97.00	119.562.843	96,92
Les		3.619,507	3.00	3.805.829	3,08
Total workers		120,598.138	100.00	123.368.672	100.00

Source: Menegkop & UKM (http://www.depkop.go.id/)

In Indonesia, despite the rapidly growing Internet media, the number and percentage of MSEs that have utilised the Internet are still very low. According to the 2016 Economic Census, only as many as 563 thousand enterprises or about 2.14 % of total MSEs in

Indonesia have utilised Internet media for their business activities (BPS, 2017). From the government side, according to Julianto (2016), there are various obstacles faced by the Indonesian government, in this case, the State Ministry of Cooperative and Small Medium Enterprise) in encouraging MSE owners to utilise DT. The obstacles include their low understanding of this kind of technology, their mindset which is not in favor of using the Internet in doing their businesses, and their lack of knowledge on how to operate this technology. Especially MSEs located in rather isolated/rural areas; many of them are unfamiliar with the online marketing system. Therefore, they prefer to do marketing with conventional methods, by utilising the distribution networks that they have been using for a long time or involving many distributors who have long been their customers.

The same fact is also shown by the findings from the 2021 national survey that of all businesses that do not carry out e-commerce activities in 2020, most of them (73.07%) said that it is more convenient to sell directly (offline), which is. Around 17.55 percent said they lack knowledge or expertise; 33.47 percent are not interested in selling online; and the remaining 8.40 percent for various other reasons (BPS, 2021).

Another thing that is also interesting to know is whether there are differences in internet usage by business actors between regions, for example between provinces, in Indonesia. This is also at the same time to prove the DD concept as previously discussed. By using 2019 national survey data on MSEs in the manufacturing industry, Figure 7 shows the distribution of MSEs using the internet by the province in the country. As can be seen, most MSEs that utilize the internet for businesses are located in Java Island, the most developed and populated region in the country (Figure 8). Provinces in Java with the highest proportion of manufacturing MSEs using the internet are Central Java with around 22.22 percent of all manufacturing MSEs using the internet in Indonesia, followed by East Java and West Java with, respectively 20.70 percent and 16.92 percent. While outside Java Island, especially in the eastern region, the percentage is much lower. For instance, in Papua only 0.1 percent, the lowest in Indonesia.

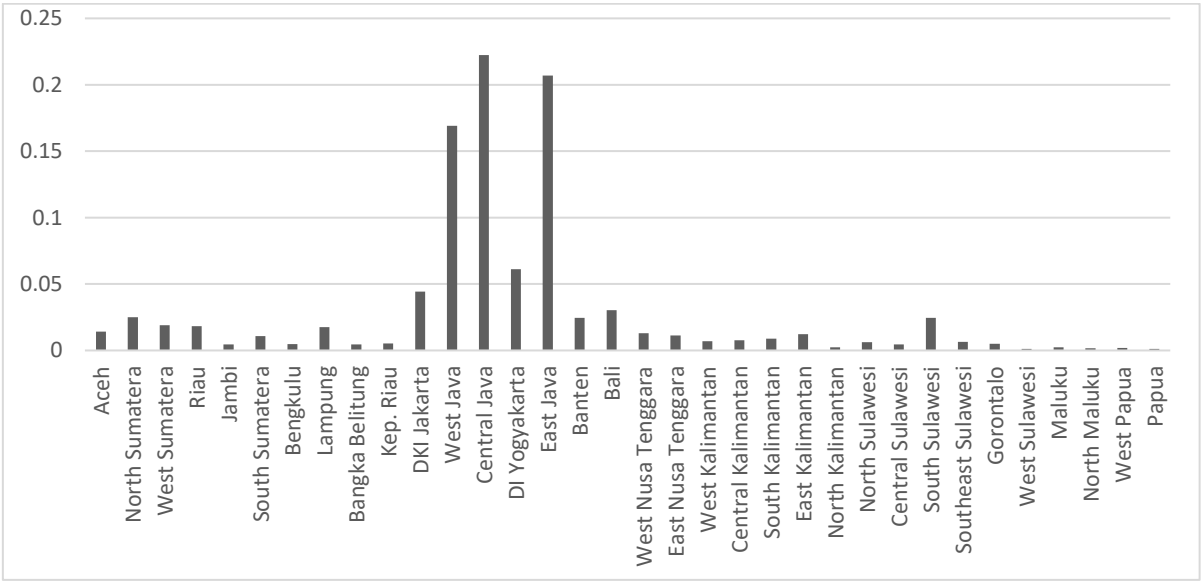


Figure 7. Percentage Distribution of MSEs using the internet by the province in Indonesia, 2019
Source: BPS (2019).

Figure 7 does not, however, show the difference between provinces in the intensity of internet usage by MSEs. For this, Figure 8 shows the percentage of total MSEs that use the internet per province. For instance, in Java, the province with the highest percentage of MSEs that use the internet is D.I Yogyakarta with near to 6 per cent. In the second place is DKI Jakarta, the Capital city of Indonesia, with almost 40 percent. By combining the data in Figure 8 with data on total income and population per province, the intensity of the internet usage by MSEs is found to have a positive relationship with the level of income per capita (Figure 9).

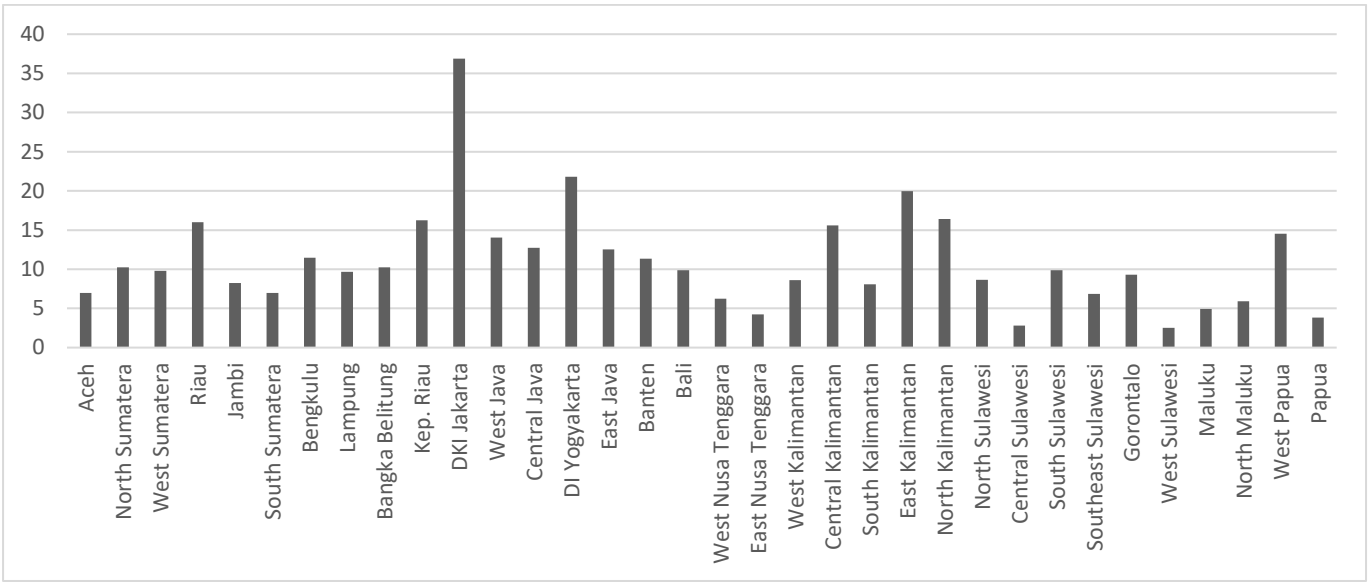


Figure 8 Percentage of MSEs using the internet per province, Indonesia, 2019
Source: BPS (2019).

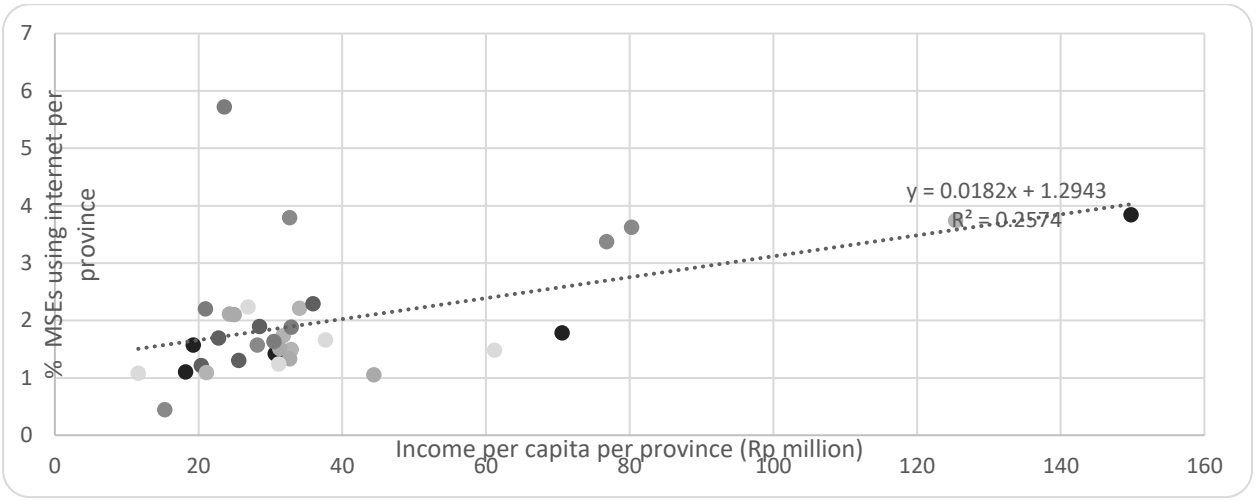


Figure 9. Percentage of MSEs using the internet and income per capita per province in Indonesia
Source: BPS (2017).

Of course, not only factors such as income per capita, level of economic development, technical skills of workers, ICT knowledge and experience of MSE owners/managers, security, and ICT infrastructure are very influential on the managers or business owners to use the internet in running their businesses, but the type of business is also very important. Or even it is more important than those factors because today many types of businesses must use the internet or require online transactions or the advantages of using the internet are felt directly by the company (e.g. very low-cost promotion activities). The types of businesses that fall into this category include travel agencies, hotels, rental services, bookstores, fashion, and online transport.

Finally, as can be seen in Table 7, it reveals that only around 7.38 percent of total MSEs in the manufacturing industry use the internet; although the percentage varies by group of industry. Only in publishing, printing, and reproduction of recording media where the number of MSEs that use the internet is slightly above 50 percent; followed by MSEs in industries producing components of computers, electronic and optical goods with almost 29 percent and in industries manufacturing other transportation equipment with close to 27 percent. There are three main purposes of using the internet according to this report, namely for marketing and advertising, purchasing raw materials, and seeking information on such as government regulations, new machines and production tools, and cheaper raw materials. It reveals that most of the MSEs that use the internet use it mainly for marketing (64.53%).

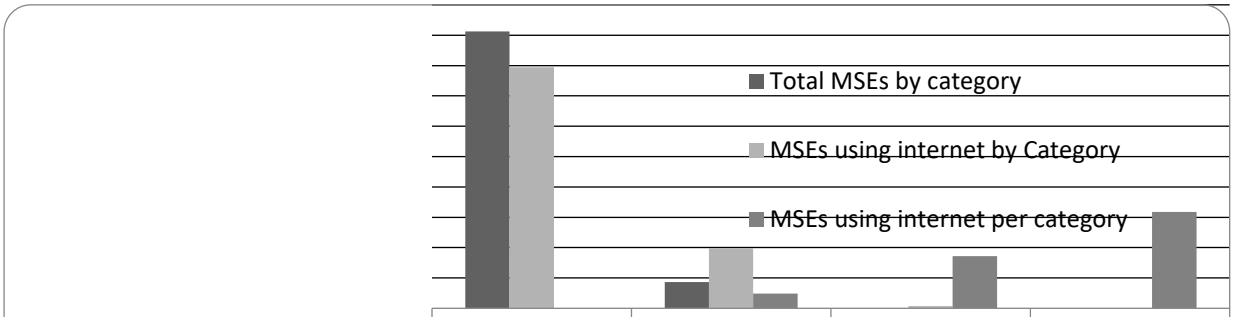
Table 7. Number of MSEs in the Manufacturing Industry that Use the Internet by Group of Industry

KBLI*	Group of industry	Number	Also export (%)	Using internet (%)
10	Food	1538117	0.14	4.85
11	Drinks	134266	0.001	5.82
12	Tobacco processing	185494	0.03	1.05
13	Textile,	283266	0.13	6.83
14	Apparel	554003	0.27	12.95
15	Leather, leather goods, and footwear	76273	0.50	15.71
16	Wood and articles of wood and cork (excluding furniture), plaited goods of rattan, bamboo, and the like	608342	0.23	3.10
17	Paper, paper items, and the like	6642	0.06	17.84
18	Publishing, printing, and reproduction of recording media	44872	0.14	51.06
20	Chemicals and chemicals	38801	0.89	4.05
21	Pharmacy, chemical drug products, and traditional medicine	16044	2.42	8.70
22	Rubber, rubber, and plastic goods	30066	0.03	13.00
23	Non-metal excavation	325233	0.12	4.84
24	Base metal	9375	2.09	9.77
25	Metal goods not machines, and equipment	184455	0.55	16.63
26	Computers, electronic, and optical goods	1305	0	28.81
27	Electrical equipment	1331	0	11.57
28	YTD machines, and equipment (which are not included)	2266	0	22.77
29	Motorized vehicles, trailers, and semi trailers	2081	5.00	23.07
30	Other transportation equipment	10969	0.02	26.94
31	Furniture	180565	1.03	13.76
32	Other processing	224226	1.10	6.70
33	Repair and installation services for machines and equipment	6736	0	6.89
	Total	4464688	0.29	7.38

Note: * Standard Classification of Indonesian Business Fields.

Source: BPS (2018).

Finally, Figure 10 gives an overview of turnover obtained by MSEs that utilize the internet for business and those which do not use the internet. As can be seen, in general, for both categories of MSEs, most have a turnover of fewer than 300 million rupiahs, namely a total of 79.41 percent for MSEs that utilizes the internet for business and 91.51 percent for those not utilizing the internet. This is also in line with the fact that due to their small size, most MSEs in Indonesia have a turnover per year below Rp 300 million. When viewed from the percentage of MSEs with turnover of more than 300 million rupiahs, more than 20 percent or about one in five MSEs that utilize the internet for business has a turnover above 300 million rupiahs. On the other hand, MSEs that do not utilize the internet for business, the percentage of MSEs which has a turnover above 300 million the rupiah is not more than 10 per cent. The ratio of MSEs that use the internet for business to those which do not use it in businesses with high turnover is greater than that in businesses with lower turnover.



	<Rp300 million	Rp300 mill.-Rp2.5 bill.	Rp2.5 bill.-Rp50 bill.	>Rp50 billion
Total MSEs by category	91.25	8.65	0.1	0.002
MSEs using internet by Category	79.41	19.78	0.78	0.03
MSEs using internet per category	0.002	4.9	17.2	31.74

Figure 10. Total MSEs, MSEs using internet and category of revenues, Indonesia, 2016
Source: BPS (2017).

This figure may give two different impressions. First, it could mean that businesses with a high turnover value usually have more complicated processes with a higher degree of computerization, or, alternatively, it could have a greater financial/investment risk than businesses with smaller turnover value. Therefore, naturally, companies including MSEs in the first category of businesses are more in need of modern technologies, including ICT, than their counterparts do in the second category of businesses. Or, alternatively, it could mean that MSEs that utilize internet for businesses have a greater opportunity to generate higher turnover values compared to those that do not utilize the internet, which is in accordance with what has been said in the literature on the benefits of using the internet for MSMEs. Findings from a survey conducted by the Indonesian Ministry of Industry indicate that successful MSMEs doing online marketing gain far greater profits than ever before (Julianto, 2016).

Policy Challenges

It reveals from the discussion above that there are various ways the government can do to accelerate digital transformation in MSEs by (i) providing low-cost (if not free) trainings or technical assistant on the use of ICT such as e-commerce, and utilization of existing market places, and how to create own website; (ii) providing special funding schemes to finance the procurement of ICT infrastructure such as computers and internet; (iii) creating new distribution channels in markets; (iv) strengthening and promoting affordable digital infrastructures needed for the enterprises and to participate in global value chains; (v) narrowing the digital divide, as well as cooperating on facilitating the flow of data and strengthening consumer and business trust in digital transactions.

As a member country of ASEAN and APEC, the Indonesian government can also link its policies to support the digitization of MSMEs with ASEAN and APEC agreements to support digitalization, especially in trade. In the context of ASEAN, it has identified six priority areas for the immediate term to address the critical barriers and accelerate existing ASEAN platforms and plans to realise digital integration: (a) facilitate seamless trade, (b) protect data while supporting digital trade and innovation, (c) enable seamless digital payments, (d) broaden digital talent base, (e) foster entreprenurship, and (f) coordinate actions.

In the context of APEC, it has created a platform for members to work together to promote innovation and digitalisation, including by supporting skills training, access to digital tools and infrastructure, and addressing cybersecurity challenges. The organisation also supports the development and application of next generation information and communication technologies among MSMEs to promote their differentiation and digital transformation.

CONCLUSION

This chapter has discussed how the digitalization process occurs in MSEs in Indonesia and what are the main challenges faced by this business group. It shows that only a very small number of MSEs utilize digital technology, especially e-commerce for marketing, although the percentage varies by industry group. There are some causes, including a lack of insight or knowledge about the importance of digital technology especially in facing competition, limited capital, lack of information and communication technology (ICT) infrastructure in their area, and entrepreneurs think no need to use internet or e-commerce because they only sell their goods in local market in small amounts.

Despite progress in recent years, it can be said that Indonesia is still not fully successful in digitizing MSMEs, especially MSEs. The Indonesian government still has homework to do to realize this. From the discussion above, it seems that there are two most important factors to be addressed in the short term, namely increasing the awareness of MSEs owners on the importance

of using digital technology for their business growth and sustainability, and creating market opportunities or certainty for their products. The existence of market opportunities or certainty will make it easier to increase the awareness of MSE owners who have not yet applied digital technology to immediately implement it.

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