THE IMPACT OF E-COMMERCE ADOPTION FACTORS ON THE GROWTH OF MSMES E-COMMERCE SALES IN JABODETABEK AREA, INDONESIA

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Abstract

The world is shifting digitally and just like humans, businesses need to adapt as well in order to keep up in this digital business era. In order to survive the current era, especially with the ongoing global pandemic, many micro, small, and medium enterprises (MSMEs) adopt e-commerce technologies to assist in their business growth. Several theories of e-commerce adoption have been proposed; the Technological Organizational and Environmental (TOE) Framework presents the impact of theoretical aspects in technology adoption. Therefore, this study aims to examine and identify how the TOE framework of e-commerce adoption contributes to improving the growth sales of MSMEs in the digital business era. The study utilizes cross-sectional data targeting 150 MSME owners and managers in Java's Big City Clusters of Jabodetabek (Jakarta, Bogor, Depok, Tangerang, Bekasi). The analysis was divided into three stages of analysis: the multi-stage regression analysis, the confirmatory factor analysis, and the regression analysis. The final result shows that technological and organizational factors have a significant and positive relationship with the growth of MSME e-commerce sales. Meanwhile, the environmental factor shows otherwise due to external parties giving uncertainty to the growth of the business by adopting the technology. The negative result is affected by several factors, one of which is the use of latent variables, making it uncertain to sum any conclusion. Hence, it is implied that MSMEs need to continue or even improve business performance by being compatible with its infrastructure, and must be able to leverage the relative advantages of using the electronic commerce platforms as a tool. Moreover, MSMEs are expected to be ready to develop their business internally while remaining vigilant and prepared for future situations that may arise. Furthermore, policymakers should implement policies to support MSMEs in becoming multichannel sellers.

Research paper

Scientificia

Introduction

The use of social media is increasing as mobile devices become more accessible. As a result of social media, the use of smartphones has become an essential part of Indonesian consumers' lives, particularly among millennials and members of generation Z, who have grown up with mobile devices. Electronic commerce (e-commerce) refers to the use of wireless portable devices to buy or sell items online and engage in online banking and other transactions. In global trade, electronic commerce has grown in popularity as mobile device usage has increased. The mobility of smartphones has swiftly normalized the usage of mobile apps and social networking sites as a method of business for MSMEs, with better reachability than e-commerce (Wicaksono & Simangunsong, 2022).

Moreover, the world has been shocked by the ongoing global pandemic, which affected the country's overall economy. A large number of MSMEs increased their online business in order to survive. During the pandemic, the Indonesian government collaborated with large enterprises such as Gojek and Grab to develop and promote digital tools for entrepreneurs. One tool was Grab Indonesia's GrabMerchant mobile app, a one-stop-service platform for MSMEs in the food and beverage industry. Similarly, social media platforms like Instagram and TikTok have introduced new advertising options for micro and small businesses. Most notably, e-commerce platforms such as Tokopedia and Shopee have been vital in assisting the growth of MSMEs, particularly during the pandemic.

Indeed, the remaining issue is to clarify which driver can boost the growth of MSMEs' e-commerce sales in Indonesia. Researchers have defined

e-commerce as a buying and selling activity in which sellers and buyers conduct transactions over the Internet (Rizaldi & Madany, 2021). Indonesia has been an e-commerce hub in southeast Asia (Wicaksono & Simangunsong, 2022). Indonesia houses several significant players in the e-commerce platform such as Shopee, Tokopedia, Lazada, and Bukalapak (Jayani, 2020). McKinsey estimated that 30 million Indonesians engage in transactions online, creating a market of at least $8 billion. During the next five years, the market could reach 40 billion (Das, Tamhane, Vatterott, Wibowo, & Wintels, 2018).

The study investigates the impact of the technological, organizational, and environmental contextual factors on the business growth of MSMEs' e-commerce sales growth in Jabodetabek, Indonesia. The academic contribution of this study is to extend TOE e-commerce adoption factors in the development of Indonesian e-commerce platforms. Some studies in digital economies have investigated the technological factors such as infrastructures, access, and other physical availability of technological innovation (Rizaldi & Madany, 2021; UNCTAD, 2019; Wicaksono & Simangunsong, 2022; Ebrahimi et al., 2021; Yakubu et al., 2022; Rahman et al., 2021). Unexplored issues include the deliberation of organizational and business environmental factors. Research in some developed countries has covered the TOE adoption factors to exemplify how better business includes adopting digital technology, enhancing technological innovation, and placing in supporting environments have been crucial factors to nourish e-commerce sales growth (Ramdani, Chevers, & Williams, 2013). However, few scholars have explored the TOE framework for Indonesian digital economic development. In

Indonesia, only a few scholars have applied more extensive of TOE adoption theory in digital platform cases (Rahayu et al., 2021).

In brief, the study will utilize primary data from 150 respondents regarding e-commerce factors among MSMEs that use a digital platform in the Jabodetabek area. The multistage quantitative analysis will be performed to investigate the determinant factors that boost e-commerce sales growth in the Jabodetabek area by combining confirmatory factor analysis and regression analysis.

Literature Review

This study illuminates which factors are used in e-commerce adoption in the development of MSMEs and identifies how the TOE framework of e-commerce adoption contributes to improving MSMEs' sales growth. In digital economic scholarships, e-commerce is still seen as an innovation for MSMEs, because it provides information in a more exciting and fun way and offers online forms at all times without time limits if all technological devices are supported (Govindaraju & Chandra, 2011). One of the expected benefits of e-commerce for MSMEs is that it provides a channel to promote and distribute their products (Duch-Brown, Grzybowski, Romahn, & Verboven, 2017). In the emerging market, the digital platform has offered an alternative marketplace for survival amid consumers' shifting shopping habits.

Ramdani et al. (2013) assert that the determining drivers can be understood by examining organizational readiness, business technological innovation, and a supportive business environment. The technological organizational and environmental (TOE) framework was initially developed by Tornatzky and Fleischer (1990) and has been used to illustrate the adoption of

innovations including enterprise applications by MSMEs. It is argued that the adoption of TOE factors among MSMEs has been used to examine the application of inter-organizational systems, e-business, electronic data interchange (EDI), open systems, and general applications (Tornatzky & Fleischer, 1990). Abebe (2014) shows that e-commerce adoption significantly and positively impacts MSMEs' average sales growth rate because it provides enhanced business process management and marketing capabilities. Indeed, an organization should first implement the managerial elements of innovativeness, pro-activeness, and risk-taking from the dynamics of its environment, representing untapped market opportunities (Abebe, 2014).

Firstly, in this study, we hypothesized the positive influence of technological contextual factors on boosting e-commerce sales growth for MSMEs. In the literature, the technological contextual factor is formed by observed indicators such as compatibility, relative advantage, as well as cost (Rahayu & Day, 2015; Ramdani et al., 2013). To serve as a technological factor indicator, compatibility refers to the innovation suitable with the technology infrastructure, value, work practices, and culture within the firm (Duch-Brown et al., 2017; Zamani, 2022). Compatibility relates to how the business rearranges its organization to adapt well to the e-commerce platform (Chiliya, K. Chikandiwa, & Afolabi, 2011). Without compatibility, MSMEs can rarely boost their sales performance (Ramdani et al., 2013). In considering the technological factor, it is crucial to examine the relative advantage of the firm to compete in the digital economy (Chiu, Chen, & Chen, 2017). Herewith, the relative advantage or perceived benefit refers to the degree of innovation that offers more benefits than the alternatives of e-commerce technol-

ogy (Chiu et al., 2017; Zamani, 2022). Hence, the technological factor measure of cost-efficient performance boosts firms' sales when they expand their utilization of digital technology (Alzahrani, 2019).

Secondly, previous studies have revealed a positive relationship between organizational factors and e-commerce sales growth. Organizational factors include indicators of organizational readiness, business size, and organizational infrastructure (Zhu, Dong, Xu, & Kraemer, 2006). From this perspective, organizational factors must encourage the firm's overall performance and strategic decisions to embrace the adoption of e-commerce technology. The TOE literature (Rahayu & Day, 2015a; Ramdani et al., 2013; Setiyani & Yeny R, 2021) presents observed indicators for organizational factors as 1) organizational readiness relevant to the skills and knowledge in business that can support e-commerce adoption; 2) MSMEs' business size related to the ability of the business to survive failures and provide both financial and human resources; and 3) the organizational infrastructure in which technology allows EDI, electronic funds transfer, and IT human resources to implement internet-related applications. The enterprises' internal attributes are associated with the organizational contextual factors that significantly impact MSMEs' adoption of e-commerce (Duan, Deng, & Corbitt, 2012).

Furthermore, previous studies indicate that environmental contextual factors also positively and significantly impact e-commerce sales growth by combining the external attributes of suppliers, customers, competitors, and government entities. External circumstances can create a market structure to construct an environmentally contextual factor. Various environmental con-

textual factors arise in adopting e-commerce, including pressure from suppliers, customers, and competitors. Ramdani et al. (2013) identify pressure from suppliers, customers, and/or competitors as a significant influence on a business that leads enterprises to think critically about their following strategies and leverage innovations in adopting technology. In addition, Zamani (2022) discussed that pressure to adopt technology enables MSMEs to take new approaches and pushes businesses to consider their needs. From this perspective, external support such as government policies or regulatory support tends to affect the adoption of e-commerce technology in society (Zhu & Kraemer, 2005). The regulation through government policies is believed to have the power to protect online business transactions and encourage MSMEs to take advantage of technology by utilizing e-commerce in the marketplace (van Dijk, 2013).

Methodology

The authors have conducted primary and secondary data collection through quantitative research. This type of research is applied to test the above mentioned hypothesis in the market reality (Sekaran, Uma and Bougie, 2014; Dana et al., 2022). In this study, the primary data will utilize online questionnaires generated using the Google Forms application, and the secondary data comes from previous literature studies, international journals, and statistical data from reliable sources.

Our research uses convenience sampling to capture information regarding our sampling characteristics (Fox, 2010). The respondents are individuals who have experienced the benefits, usefulness, infrastructure, and pressures of adopting technology through e-commerce platforms. In addition,

the MSMEs are chosen according to the following characteristics: fewer than 99 employees, assets worth less than IDR 10 billion, and annual sales of less than IDR 50 billion with their business located in the Jabodetabek area. This study collected 150 respondents that matched those characteristics on Google Forms application.

The research model with a dependent variable that represents the growth of MSMEs e-commerce sales that have gone through 3 stages. First, the multi-stage regression is used to provide an important complement to the traditional regression analysis. This multi-stage regression analysis was developed as an estimation method called Simultaneous Equation Modeling (SEM), which is a set of statistical techniques used to measure and analyze the relationships of observed and latent variables. Second, the Confirmatory Factor Analysis (CFA) represents the indicator (Hair, Black, Babin, & Anderson, 2018). CFA is a measurement model that uses the observed indicator variables to estimate continuous latent variables. Lastly, we use regression analysis to determine the effect of independent variables on the dependent variable. The research model can be seen as follows:

$$GrowthSales\ (Y) = \beta_0 + \beta_1 x1_i + \beta_2 x2_i + \beta_3 x3_i + e \qquad (1)$$

Where:

β_0	= Constant
$\beta_1, \beta_2, \beta_3$	= Coefficient of Variables
$x1_i$	= Technological contextual factor
$x2_i$	= Organizational contextual factor
$x3_i$	= Environmental contextual factor
e	= Error

Findings & Discussion

Of all MSMEs in Indonesia, particularly in the Jabodetabek area, 150 MSME owners or managers completed the questionnaire for this study. The majority of those who completed the questionnaire came from various areas in Jabodetabek, with the highest number coming from Jakarta and majority classified as a micro-sized businesses according to their total financial revenues in regard to the MSMEs classification, as shown in Figure 1 below.
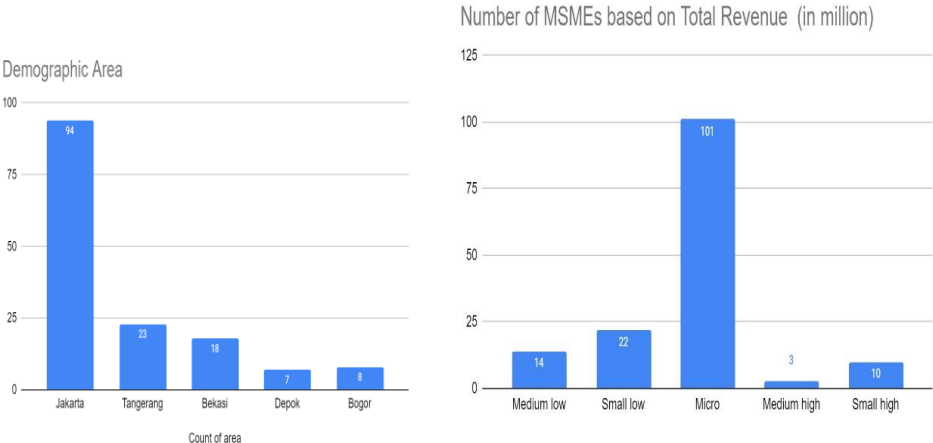

Figure 1. Respondents' Characteristics

For Figure 1 above, we collected the data from the respondents who have a digital business located in Jakarta, Tangerang, Bekasi, Depok, and Bogor, with varying business sizes.

As technological innovations arise, financial innovations arise too. Financial innovations can be considered as mobile or internet payments. As seen in

Figure 2, digital/mobile payment put in the first place by 29% among other payment methods.
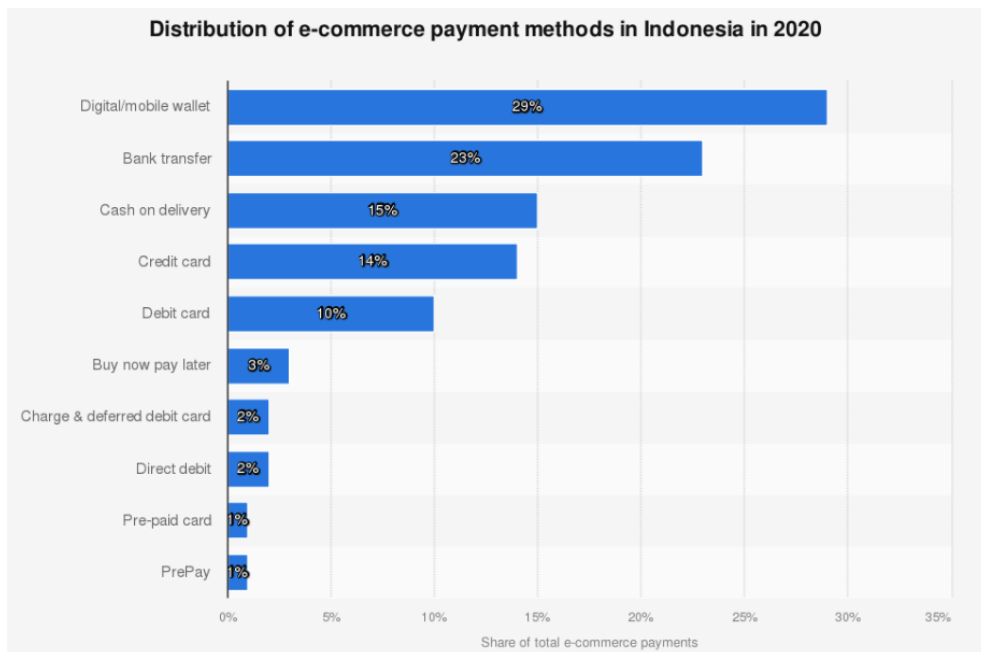

Figure 2. Distribution of e-commerce payment methods in Indonesia in 2020 (Source: Statista, 2022)

The authors conducted a validity and reliability test before exercising the inferential statistics. We follow the general Cronbach's alpha rule that a score between 0.6-0.7 is specified as an acceptable level of reliability, and 0.8 or greater can be a very good reliability level (Ursachi, Horodnic, & Zait, 2015). For the item correlation test, we compare the validity to the standard-ized correlation.[1] Table 1 shows that all of the observed indicators are valid

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[1] with df = 148 within column 0.05 for two-way test, the table r showed the number of 0.1603

for each latent variable. The latent variables are reliable indicators if we match Table 1 with those statistical standards.

Table 1 indicates that compatibility, relative advantage, and cost efficiency are significant indicators of the technological contextual factor. Furthermore, organizational readiness, firm size, and infrastructure are significant indicators of the organizational contextual factor. Moreover, supplier pressure, customer pressure, competitive pressure, and external support are significant indicators of the environmental contextual factor, as being displayed in Table 1.

Table 1. Validity & Reliability and Confirmatory Factor Analysis Result (CFA)

Variables	Item-test correlation	Cronbach's Alpha	Coefficient of CFA	p-value for CFA
Compatibility (x1)	0.7537	0.6116	0.340	0.000
Relative Advantage (x2)	0.7721		0.407	0.000
Cost Efficiency (x3)	0.7524		0.491	0.000
Organization Readiness (x4)	0.7992	0.7790	0.347	0.000
Firm Size (x5)	0.8210		0.367	0.000
Organizational Infrastructure (x6)	0.8794		0.430	0.000
Supplier Pressure (x7)	0.6863	0.7440	0.271	0.000
Customer Pressure (x8)	0.8042		0.339	0.000
Competitive Pressure (x9)	0.8504		0.354	0.000
External Support (x10)	0.6531		0.283	0.000

Source: Authors, 2022

Furthermore, this study conducts a linear regression of the influence of independent to dependent variables, as shown in Table 2. Firstly, the linear regression confirms the positive and significant influence of the technological contextual factor to MSMEs' e-commerce sales growth. The indicators of the technological contextual factor show that it can help business users in Indonesia to increase their sales business development. This is compatible with the previous findings from Ramdani (2013). Therefore, when businesses, or in this case MSMEs, consider e-commerce as compatible with their business, they will continue to use it or start using it, which in turn benefits their business performance (Ramdani et al., 2013; Asih et al., 2017). The adoption of e-commerce technology offers a relative advantage for competition in the digital economy (Chiu et al., 2017). This positive relationship is confirmed in our statistical regression.

Secondly, our linear regression indicates a positive and significant relationship between the organizational contextual factor and MSMEs' e-commerce sales growth. Previous studies found that e-commerce is not solely about physical infrastructure, but that faster sales development relies on organizational concerns of human resource skills and competence in adopting e-commerce development (Rahayu & Day, 2015; Zhu, Kraemer, & Xu, 2006). Moreover, a previous research by Seng Lim et al., (2018) argued that small-sized SMEs must consider resource reallocation by conducting feasibility research due to scarcity of resources. Medium-sized SMEs, on the other hand, rarely face this issue. One possible explanation is that medium-sized SMEs are more innovative and capable of implementing new technologies

because they have adequate resources and skilled workers. Therefore, this regression confirms the positive and significant impact of the organizational contextual factor on MSMEs' e-commerce sales growth.

The econometric regression reveals an insignificant influence of the environmental contextual factor on MSMEs' e-commerce sales growth. External factors such as an uncertain environment, customers, suppliers, trading partners, and governments can influence an organization's decision to adopt new innovative technologies (Seng Lim et al., 2018). Past studies reveal some uncertainties regarding the business environment of e-commerce in Indonesia (Wicaksono & Simangunsong, 2022). Some regulatory functions in e-commerce in some developing areas do not match to what business entrepreneurs need (van Dijk, 2013). The spatial contexts in some emerging contexts show that this variability in the external environment may not induce further e-commerce business growth.

Table 2. Linear Regression Factors to Affect MSMEs' Sales Growth

Context	Coefficient	Z - Statistics	P-value
Technological Contextual Factor	0.189	3.06	0.003
Organizational Contextual Factor	0.147	2.47	0.015
Environmental Contextual Factor	-0.088	-0.17	0.867
R-square: 88.55%			
Adjusted R-square: 88.31%			
F - Statistics: 378.78			

Source: Authors, 2022

Conclusion

This study investigates the impact of technological, organizational, and environmental contextual factors on the business growth of MSMEs' e-

commerce sales growth in Jabodetabek, Indonesia. The results show that two of the three contexts, namely technological and organizational contextual factors, are significant at the 5 percent level. However, the findings demonstrate the insignificance of the environmental contextual factor. As a result, all environmental contextual variables, such as supplier pressure, customer pressure, competitive pressure, and external support, have a negative relationship with the dependent variable, which is the growth of e-commerce sales performed by MSMEs, due to the uncertainty of external factors. However, much cannot be said about the environmental contextual factor, since it utilizes latent variables in the model which are not derived from direct data. Hence, it is difficult to reach a valid and reliable conclusion.

Seeing that several factors, especially in the technological and organizational contexts, evidently have a significant effect and become a detriment to the adoption of e-commerce technology, the authors have provided a number of recommendations. In terms of the technological contextual factors, with consideration for the compatibility of the business, it is advisable for MSMEs to continue or even improve business performance by becoming compatible with its infrastructure, values, and beliefs. Similarly, MSMEs must be able to leverage the relative advantages of electronic commerce platforms as a tool to improve business processes, lower operational and business administration costs, etc. Likewise, within organizational contextual factors, MSMEs must establish readiness in their internal business or organization by creating business systems and skills in technology infrastructure and IT human resources. Furthermore, MSMEs are intended to develop their business internally by increasing their assets, number of employees, and eventually

sales revenue so that the use of technological innovations is not necessarily in vain.

Concerning environmental contextual factors, it also plays a role in the adoption of e-commerce technology. Environmental aspects include external parties that influence the thinking of MSMEs, such as pressure from suppliers, customers, and/or competitors and government policies. Based on the regression findings, the variables are not recognized as factors influencing Indonesian MSMEs' adoption of e-commerce technology. However, it is recommended that MSMEs remain vigilant and be prepared for the upcoming situations that may arise in the future. Despite the results, MSMEs still need to consider the new strategies and innovations that will help the business run well or even better, especially entering the digital era.

Due to the nature of the research questions and the relatively limited sample size regarding adopting e-commerce technology, the analysis observed only 150 samples within the Jabodetabek area. This is because the process of respondents to fill the questionnaire takes a great deal of time. However, researchers are advised to provide some incentive to the respondents. For future research, the authors should increase the sample size to study a larger portion of respondents in order to fully capture the effect and improve the model's estimation accuracy. In addition to the sample size, the authors also suggest increasing the area scope of research beyond Jabodetabek. Furthermore, future researchers could use panel data instead of cross-sectional data, because panel data has more information, variability, and efficiency. In addition, cross-sectional data cannot detect or measure statistical effects that panel data can.

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