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ANALYSIS OF E-COMMERCE ADOPTION FACTORS BY MICRO, SMALL, AND MEDIUM ENTERPRISE, AND ITS EFFECT ON OPERATING REVENUE

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ABSTRACT

This research aims to examine the effect of organizational readiness, external pressure, and perceived benefits on MSMEs' e-commerce adoption, and to examine the effect of e-commerce adoption by MSMEs on operating revenue. The sample of this study is MSME owners and managers in Malang city. Data were collected by survey method using convenience sampling technique. The relationship between variables in this study were analyzed using binary regression logistic and ordinal regression with SPSS application. Binary logistic regression was used to analyze the effect of organizational readiness, external pressure, and perceived benefits on MSME's e-commerce adoption. Meanwhile ordinal regression was used to analyze the effect of the e-commerce adoption on the operating revenue. The results of this study indicate that external pressure and perceived benefits influence MSMEs' e-commerce adoption, while organizational readiness does not influence MSMEs' e-commerce adoption. In addition, e-commerce adoption does not increase MSME's operating revenue. The results of this study provide suggestion to MSME actors to adopt e-commerce as a medium to expand their business. The role of the government is also needed to provide socialization, training, and assistance that can support the use of e-commerce throughout Indonesia. In addition to using e-commerce, other innovations are needed to be able to maintain business during the pandemic and also increase operating revenue.

KEYWORDS: E-Commerce Adoption; External Pressure; Operating Revenue; Organizational Readiness; Perceived Benefits.

INTRODUCTION

MSMEs have an important role in the Indonesian economy. Based on data from the Ministry of Cooperatives and SMEs, the percentage of MSMEs to the total business units in Indonesia in 2019 was 99.99% and contributed to Indonesia's Gross Domestic Product (GDP) of 60.51% or around Rp9.58 billion. To encourage the development and digitization of MSMEs, the Ministry of Cooperatives and SMEs collaborated with the Ministry of Communication and Information to initiate the "UMKM Go Online" program. Although the target of 8 million MSMEs go online in the program has been successfully achieved, it is only around 14.4% of the total MSMEs in Indonesia.

In addition, MSMEs in Indonesia are also still facing various problems, namely constraints in terms of capital, low understanding and experience in using technology, and unstable product quality (Suwarni et al., 2019). These various problems can have an impact on the performance of MSMEs, performance that is not optimal can cause business income which tends to be low and causes MSME actors generally cannot promote their products through mass media because their operating revenue cannot cover promotion costs. If there are promotional costs, the media chosen are tend to be cheap and cover a small area (Trisanti, 2001).

E-commerce can be an innovation strategy for MSMEs to face increasingly fierce business competition in the era of globalization, where the innovation strategy prioritizes in increasing product and process innovation (Pratiwi & Fanani, 2019). Kosadi et al. (2021) stated that the use of digital transactions that generate transaction evidence for MSMEs provides convenience, time and cost efficiency, simplicity of layout and completeness, as well as increased data accuracy in recording and preparation of financial reports, considering that in 2019 it was only around 7.52% MSMEs that have prepared financial reports.

To predict the factors for the adoption of e-commerce by MSMEs, this research refers to the diffusion of innovations theory. In his book, Rogers (2010) states that farmers who have more resources can easily gain access to adopt innovations in the form of technology. The influence of external parties, such as interpersonal networks, opinion leadership, and change agent also can affect individuals to adopt innovations. The characteristics of the innovation are also important in determining the adoption of the innovation. Out of the five innovation attributes, relative advantage is the best predictor to determine the level of innovation adoption. In addition, this research also wants to know the effect of the adoption of innovation in the form of e-commerce by MSMEs on operating revenue.

Previous research by Chau et al. (2020) showed that there are positive relationships between perceived benefits, perceived compability, perceived security, organizational readiness, organizational innovativeness, and managers' IT knowledge and the decision to adopt m-commerce in Vietnamese SMEs. Nurlinda et al. (2019) stated that organizational rediness and technology readiness have a positive and significant influence on e-commerce adoption, while external environment does not. In terms of the benefits or impact of adopting *e-commerce* by MSMEs, Nurlinda et al. (2019) also stated that e-commerce adoption has a positive and significant impact on SMEs' financial performance. Tan and Ouyang (2004) argues that doing business online has an impact on increasing sales, efficiency, distribution networks, and the number of competitors.

It is hoped that the results of this study can be a reference for MSME owners to develop their business through the development of an accounting information system using e-

commerce, as well as a reference for the Cooperatives and SMEs Office and the government to help develop MSMEs through e-commerce by providing the necessary facilities.

Hypothesis Development

The organizational readiness variable refers to the relationship between socioeconomic disparities and the diffusion of innovation. Rogers (2010) stated that farmers who have more resources can easily gain access to adopt innovations in the form of technology. According to Cragg and King (1993) in Iacovou et al. (1995), economic costs and lack of knowledge of technology are the two main factors that can hinder the growth of IT in small companies. The organizational readiness variable was chosen because generally MSMEs have limited capital, both financial and technological (Suwarni et al., 2019). Al-Bakri and Katsioloudes (2015), Chwelos et al. (2001), Yulimar (2006), Nurlinda et al. (2019), and Chau et al. (2020) state that organizational readiness has a significant effect on the adoption of technology, such as EDI, e-commerce, and m-commerce by small entrepreneurs. Lim et al. (2021) also stated that organizational readiness is significantly influence SME's e-commerce continuance intention. Meanwhile, Grandon and Pearson (2004) and Iacovou et al. (1995) stated that organizational readiness has no effect on the adoption of EDI and e-commerce by small entrepreneurs.

H₁: Organizational readiness has a positive effect on the e-commerce adoption by MSMEs.

Diffusion of innovation theory states that the influence of the environment, such as interpersonal networks, opinion leaders, and change agent , may affect the adoption of innovation. Al-Bakri and Katsioloudes (2015, Chwelos et al. (2001), Grandon and Pearson (2004), Iacovou et al. (1995), and Yulimar (2006) state that external pressure significantly influence the adoption of EDI and e-commerce by small entrepreneurs. Lim et al. (2021) also stated that external pressure is significantly influence SME's e-commerce continuance intention.

H₂: External pressure has a positive effect on the e-commerce adoption by MSMEs.

Perceived benefits refers to the characteristics or attributes of the innovation, namely the relative advantage in the innovation diffusion theory. Rogers (2010) stated that the relative advantage of an innovation has a positive effect on the rate of adoption, and is the best predictor for determining the rate of adoption of an innovation. Chwelos et al. (2001), Grandon and Pearson (2004), Iacovou et al. (1995), Yulimar (2006), and Chau et al. (2020) state that perceived benefits influence the adoption of technology, such as EDI, e-commerce, and m-commerce by small companies. Lim et al. (2021) also stated that perceived benefits are significantly influence SME's e-commerce continuance intention.

H₃: Perceived benefits have a positive effect on the e-commerce adoption by MSMEs.

This study combines operating revenue to the research model to find out whether changes in accounting information systems with the adoption of *e-commerce* can have an effect on increasing MSME business income. Saridakis et al. (2018) states that three types of e-commerce development, namely website owned by entrepreneurs themselves, third-party *websites*, and social media, increase the possibility of an increase in SME income. While Lorca et al. (2019) state that e-commerce , both B2B and B2C types, has no effect on increasing revenue.

H₄: The adoption of e-commerce by MSMEs has a positive effect on increasing operating revenue.

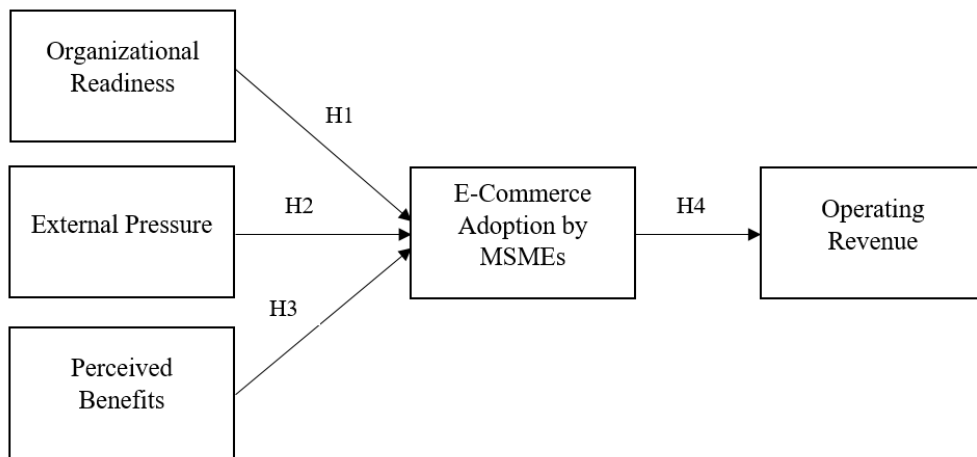The following is the theoretical framework in this research.

Figure 1.
Theoretical
Framework

METHOD

Research Design

This research uses quantitative approach and hypothesis testing. This study is a causal study that aims to determine the causal relationship between e-commerce adoption by MSMEs and organizational readiness, external pressure, and perceived benefits, as well as an increase in operating revenue that is influenced by the adoption of e-commerce.

Population and Sample

MSMEs in Malang City who have been active for the past year and have adopted *e-commerce* or have known *e-commerce* but decided not to adopt are the population of this study and the number of population cannot be known certainly. This study uses convenience sampling method as a sampling technique. According to Roscoe (1975) in Sekaran and Bougie (2016), the appropriate sample size for most of researches is 30-500 samples, and is 10 times larger or more than the number of variables used in research for multivariate research. Based on these considerations, this study set a sample size of 80. This study has the unit of analysis is the organization and the respondents of this study are the owners or managers of MSMEs.

Data Types and Sources

The primary data used in this study were obtained from MSME respondents in Malang City who were active during the past year and had adopted e-commerce or had knowledge of e-commerce but decided not to adopt.

Research Instrument

Questionnaires were used to collect research data and measure the factors of e-commerce adoption by MSMEs and the effect of e-commerce adoption on business operating revenue. Questions related to the construct of organizational readiness, external pressure, and perceived benefits are derived from Grandon and Pearson (2004). Questions related to the construct of e-commerce adoption by MSMEs originate from Grandon and Pearson (2004); Saridakis et al. (2018). Questions related to the construct of operating revenue come from Saridakis et al. (2018).

Construct	Scale	Description
KO1	Likert Scale 5 (Strongly Disagree-Strongly Agree)	Ownership of financial resources to adopt e-commerce
KO2	Likert Scale 5 (Strongly Disagree-Strongly Agree)	Ownership of technological resources to adopt e-commerce
DE1	Likert Scale 5 (Strongly Disagree-Strongly Agree)	There is a pressure from competition to adopt e-commerce
DE2	Likert Scale 5 (Strongly Disagree-Strongly Agree)	There is a pressure from social factors to adopt e-commerce
DE3	Likert Scale 5 (Strongly Disagree-Strongly Agree)	Dependence on other firms that have adopted e-commerce
DE4	Likert Scale 5 (Strongly Disagree-Strongly Agree)	There is a pressure from the industry to adopt e-commerce
DE5	Likert Scale 5 (Strongly Disagree-Strongly Agree)	There is a pressure from the government to adopt e-commerce
MD1	Likert Scale 5 (Strongly Disagree-Strongly Agree)	Specific tasks can be completed more quickly
MD2	Likert Scale 5 (Strongly Disagree-Strongly Agree)	Improve job performance
MD3	Likert Scale 5 (Strongly Disagree-Strongly Agree)	Increase productivity
MD4	Likert Scale 5 (Strongly Disagree-Strongly Agree)	Increase work effectiveness
MD5	Likert Scale 5 (Strongly Disagree-Strongly Agree)	Make work easier
MD6	Likert Scale 5 (Strongly Disagree-Strongly Agree)	E-commerce is useful for the company
PE1	Nominal Scale (Yes – No)	Ownership and use of websites / social media / third-party website or marketplaces
PU1	Ordinal Scale (Increases – Tends to Remain - Decreases)	The impact of using e-commerce on operating revenue over the past year

Table 1. Questionnaire

Additional information:

KO   = *Kesiapan Organisasional* (Organizational Readiness)

DE   = *Dorongan Eksternal* (External Pressure)

MD   = *Manfaat yang Dirasakan* (Perceived Benefits)

PE   = *Pengadopsian* E-Commerce (E-Commerce Adoption)

PU   = *Pendapatan Usaha* (Operating Revenue)

Data Analysis Technique

After data was obtained, binary logistic regression and ordinal regression were used to analyze the data and with the help of the SPSS application. Binary logistic regression was used to analyze the effect of organizational readiness, external pressure, and perceived benefits, which were measured using a Likert scale, on the variable of e-commerce

adoption, which was measured using a binary scale. Meanwhile, ordinal regression was used to analyze the effect of the e-commerce adoption, which was measured using a nominal scale, on the operating revenue, which was measured using an ordinal scale.

Tests		Parameter	Rule of Thumbs
Validity and Reliability Test	Validity Test	R Value and R Table	R value greater than R table
		Sig.	Less than 0,05
	Reliability Test	Cronbach's Alpha	Greater than 0,7
Binary Logistic Regression	Goodness of Fit Test	Hosmer-Lemeshow Goodness-of-Fit	Greater than 0,05
	Overall Fit Test	-2 Log Likelihood	-2Log Likelihood at the beginning block greater than -2Log Likelihood after the independent variable is added to the model
	R Square Analysis	Nagelkerke R-Square	Aims to measure the level of change in the dependent variable which is influenced by changes in the independent variable.
	Hypothesis Test	Wald Test	Sig. less than 0,05
Ordinal Regression	Goodness of Fit Test	Sig.	Greater than 0,05
	Model Fit Test	-2 Log Likelihood	-2Log Likelihood at the intercept only greater than -2Log Likelihood after the independent variable is added to the model
		Sig.	Greater than 0,05
	R Square Analysis	Nagelkerke R-Square	Aims to measure the level of change in the dependent variable which is influenced by changes in the independent variable.
	Hypothesis Test	Wald Test	Sig. less than 0,05
	Parallel Lines Test	Sig.	Greater than 0,05

Table 2.
Test Parameters

RESULTS AND DISCUSSION

Respondent Demographics

This research was conducted from March 4 to 22, 2021. Researcher managed to distribute 80 questionnaires to owners or managers of MSMEs in Malang City and all of them have been responded. A total of 13 questionnaires could not be used because these respondents adopted e-commerce for less than one year so they did not meet the research sample requirements. A total of 67 questionnaires or 83.75% of the total questionnaires can be used and analyzed.

No.	Information	Quantity	Percentage
1.	**Gender**		
	Male	28	41,8%
	Female	39	58,2%
	Total	**67**	**100%**
2.	**Age**		
	Under 20 years old	0	0%
	20-35 years old	14	20,9%
	36-50 years	47	70,1%
	51-65 years old	6	9%
	Over 65 years old	0	0%
	Total	**67**	**100%**
3.	**Education**		
	Elementary/junior high/high school	19	28,4%
	Diploma	11	16,4%
	S1	37	55,2%
	S2/S3	0	0%
	Others	0	0%
	Total	**67**	**100%**
4.	**Position**		
	Owner	9	13,4%
	Manager	11	16,4%
	Owner and manager	47	70,2%
	Total	**67**	**100%**
5.	**Business Sector**		
	Trading	55	82,1%
	Manufacture	11	16,4%
	Agriculture	0	0%
	Plantation	0	0%
	Farm	0	0%
	Fishery	0	0%
	Service	1	1,5%
	Others	0	0%
	Total	**67**	**100%**
6.	**Business Size**		
	Micro	59	88,1%
	Small	8	11,9%
	Medium	0	0%
	Total	**67**	**100%**
7.	**E-Commerce Adoption**		

No.	Information	Quantity	Percentage
	Has adopted e-commerce	55	82,1%
	Not adopting e-commerce	12	17,9%
	Total	**67**	**100%**
8.	**Number of Computers/Laptops Owned**		
	0	55	82,1%
	1	10	14,9%
	2	1	1,5%
	3	0	0%
	4	1	1,5%
	Total	**67**	**100%**
9.	**Usage of Internet Service Providers**		
	Yes	60	89,6%
	No	7	10,4%
	Total	**67**	**100%**

Table 3. Demographic Data of Respondents

Validity and Reliability Test

Validity Test

Validity test aims to determine the ability of the research instrument to measure the research construct . Each indicator in the construct can be said to meet the validity test if the value of Sig. smaller than the alpha 0.05 and the calculated R value is greater than the R table, which is 0.2027 for the degree of freedom (N-2) 65. The following are the results of the validity test in this study.

Table 4 shows that all indicators have Sig. value less than 0,05 and the calculated R value is greater than the R table. Based on this result, it can be seen that all constructs and indicators have passed the test, so they can be considered valid.

Indicator	Sig.	R Value
KO1	0,000	0,922
KO2	0,000	0,939
DE1	0,000	0,659
DE2	0,000	0,699
DE3	0,000	0,704
DE4	0,000	0,731
DE5	0,000	0,683
MD1	0,000	0,989
MD2	0,000	0,982
MD3	0,000	0,980
MD4	0,000	0,958
MD5	0,000	0,989
MD6	0,000	0,959
PE1	0,000	0,922
PU1	0,000	0,939

Table 4. Construct Validity Test

Reliability Test

Reliability test aims to measure the consistency and stability of the questionnaire as a data collection tool. The research questionnaire can be said to meet the instrument reliability test if the Cronbach's alpha value of each construct is greater than 0.6. The following are the results of the instrument reliability test in this study.

Construct	Cronbach's Alpha
Organizational Readiness	0,843
External Pressure	0,727
Perceived Benefits	0,990

Table 5.
Cronbach's Alpha and Composite Reliability

Table 5 shows that the value of Cronbach's alpha and of the overall construct has been more than 0.6 and passed the test, so that the instrument can be judged to be reliable.

Binary Logistic Regression Test

Goodness of Fit Test aims to determine whether the regression model is feasible to use. The model can be said to be feasible if the Hosmer-Lemeshow Goodness-of-Fit value is greater than 0.05. The results of the model feasibility test are served in Table 6. Table 6 shows the value of Sig. from the Hosmer-Lemeshow test is 0,998 or greater than 0,05. Based on this result, it can be concluded that the research model is feasible.

Model Fit Test aims to determine whether the model fits the data. It can be said to pass the test if the value of -2Log Likelihood at the beginning block or before the independent variable is added to the model is greater than the value of -2Log Likelihood after the independent variable is added to the model. The following are the results of testing *the fit model* in the study. Based on Table 7 it can be seen that the value of -2Log Likelihood in the initial block is greater than the value of -2Log Likelihood in the final block, this indicates that the second regression model is better after adding independent variables to the model and fits the data. R Square Analysis aims to determine the effect of the independent variables in the research model, namely organizational readiness, external pressure, and perceived benefits, on the dependent variable, namely the adoption of e-commerce by SMEs. The value of the coefficient of determination or *adjusted R square* in logistic regression can be seen from the value of Nagelkerke R Square. The following are the results of testing the coefficient of determination.

Table 6.
R- Hosmer-Lemeshow Goodness-of-Fit Test

Step	Chi-Square	df	Sig.
1	0,979	8	0,998

Block	-2Log Likelihood
Block 0	62,984
Block 1	26,211

Table 7.
Model Fit Test

Step	-2Log Likelihood	Cox & Snell R Square	Nagelkerke R Square	
1	26,211	0,422	0,693	**Table 8.** Nagelkerke R Square

Based on Table 8, it can be seen that the Nagelkerke R Square value is 0.693. This shows that the level of variation of the e-commerce adoption variable of 69.3% is explained by changes in the independent variables in the study, namely organizational readiness, external pressure, and perceived benefits. While the remaining 30.7% is explained by changes in other variables outside the research model.

Hypothesis Testing

Hypothesis testing in logistic regression is called the wald test. The hypothesis is said to be accepted if the value of Sig. smaller than 0.05. The following is the hypothesis testing in this study.

	B	S.E.	Wald	df	Sig.	Exp(B)	
Organizational Readiness	1,610	1,140	1,994	1	0,158	5,001	
External Pressure	0,489	0,248	3,892	1	0,049	1,630	
Perceived Benefits	0,217	0,091	5,725	1	0,017	1,242	**Table 9.** Hypotheis Testing
Constant	-23,310	10,616	4,818	1	0,028	0,000	

Based on Table 9, it can be seen that the regression model in this study is as follows.

EA = -23,31 + 1,61OR + 0,489EP + 0,217PB

Additional information:

EA   : E-Commerce Adoption

OR   : Organizational Readiness

EP   : External Pressure

PB   : Perceived Benefits

Hypothesis 1

Hypothesis 1 in this study is organizational readiness has a positive effect on e-commerce adoption by MSMEs. Table 9 shows that the beta (β) value is positive 1,610 and the value of Sig. is 0,158. It can be seen that the significant value is greater than 0,05. Based on this result, it can be concluded that the adoption of e-commerce by MSMEs is not influenced by organizational readiness and **hypothesis 1 is rejected**.

Hypothesis 2

Hypothesis 2 in this study is that external pressure has a positive effect on e-commerce adoption by SMEs. Table 9 shows that the beta (β) value is positive 0,489 and the value of

Sig. is 0,049. It can be seen that the significant value is less than 0,05. Based on this result, it can be concluded that the adoption of e-commerce by MSMEs is positively influenced by external pressure and **hypothesis 2 is accepted**.

Hypothesis 3

Hypothesis 3 in this study is that perceived benefits have a positive effect on e-commerce adoption by MSMEs. Table 9 shows that the beta (β) value is positive 0,217 and the value of Sig. is 0,017. It can be seen that the significant value is less than 0,05. Based on this result, it can be concluded that the adoption of e-commerce by MSMEs is positively influenced by perceived benefits and **hypothesis 3 is accepted**.

Ordinal Regression Test

Goodness of Fit Test aims to determine whether the regression model is feasible to use. The model can be said to be feasible if the value of Sig. greater than 0.05. The following are the results of the model feasibility test in this study.

Table 10. R- Hosmer-Lemeshow Goodness-of-Fit Test

Table 10.
R- Hosmer-
Lemeshow
Goodness-of-
Fit Test

	Chi-Square	df	Sig.
Pearson	0,913	1	0,339
Deviance	1,418	1	0,234

Based on Table 10, it can be seen that the Pearson value is 0.913 with a significance of 0.339 and the Deviance value is 1.418 with a significance of 0.234. Sig. values have been greater than 0.5 so it can be concluded that the research model is feasible.

Model Fit Test aims to determine whether the model fits the data. It can be said to pass the test if the value of -2Log Likelihood at the intercept only or before the independent variable is added to the model is greater than the value of -2Log Likelihood after the independent variable is added to the model, and the significance value is greater than 0,05. The following are the results of testing *the fit model* in the study.

Table 11. Model Fitting Information

Table 11.
Model Fitting
Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	13,487			
Final	11,574	1,913	1	0,167

Based on Table 11 it can be seen that the value of -2Log Likelihood when the independent variable is not included is greater than the value of -2Log Likelihood in the final model, the table also shows the significance value 0,167 or greater than 0,05. This indicates that the second regression model is better after adding independent variables to the model and fits the data.

R Square Analysis

This test aims to determine the effect of the independent variables in the research model, namely e-commerce adoption bye MSMEs, on the dependent variable, namely the the

increase in operating revenue. The value of the coefficient of determination or adjusted R square in ordinal regression can be seen from the value of Nagelkerke R Square. The following are the results of testing the coefficient of determination.

Cox & Snell R Square	0,028
Nagelkerke R Square	0,035
Mc Fadden	0,017

Table 12. Pseudo R Square

Based on Table 12 it can be seen that the value of Nagelkerke R Square is 0.035. This shows that the variable level of variation of the 3.5% increase in operating income is explained by changes in the independent variable in the study, namely the adoption of e-commerce . While the remaining 96.5% is explained by changes in other variables outside the research model.

Hypothesis Testing

Hypothesis testing in ordinal regression is called the wald test . The hypothesis is said to be accepted if the value of Sig. smaller than 0.05. The following is the hypothesis testing in this study.

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[PU1=1]	0,623	0,282	4,870	1	0,027	0,070	1,177
	[PU1=2]	2,010	0,408	24,316	1	0,000	1,211	2,809
Location	[PE=0]	-1,041	0,835	1,556	1	0,212	-2,678	0,595
	[PE1=1]	0	.	.	0	.	.	.

Table 13. Hypotheis Testing

Hypothesis 4 in this study is that the adoption of e-commerce by MSMEs has a positive effect on increasing operating revenue. Table 13 shows that the wald value is positive 1,556 and the value of Sig. is 0,212. It can be seen that the significant value is greater than 0,05. Based on this result, it can be concluded that the increase in operating income is not influenced by the MSMEs' e-commerce adoption and **hypothesis 4 is rejected**.

Discussion of Hypothesis Testing Results

The Effect of Organizational Readiness on MSME's E-Commerce Adoption

Based on the results of this study, it can be seen that hypothesis 1 is not accepted or rejected, or e-commerce adoption by MSMEs is not influenced by organizational readiness. This shows that ownership of resources to adopt *e-commerce*, both in the form of financial and technological resources, cannot encourage MSMEs to adopt e-commerce. Grandon and Pearson (2004) and Iacovou et al. (1995) also show that organizational readiness has no significant effect on the decision to adopt e-commerce. Iacovou et al.

(1995) found that two of the seven study samples had high organizational readiness but were less likely to adopt EDI immediately.

While Al-Bakri and Katsioloudes (2015), Chwelos et al. (2001), Yulimar (2006), Nurlinda et al. (2019), Chau et al. (2020), and Lim et al. (2021) are not in line with the results of this study and state that the adoption of e-commerce by small entrepreneurs is positively and significantly influenced by organizational readiness. According to Chwelos et al. (2001), there are several important conditions for organizations to be able to adopt information technology, they must have technical capabilities, available resources, and trading partners who also use the technology.

The result of this study indicates that there is no relationship between ownership of financial and technological resources with MSMEs' e-commerce adoption. So that the adoption of e-commerce by MSMEs can be drive through other variables, such as in this research model, namely external pressure and perceived benefits.

The Effect of External Pressure on the MSME's E-Commerce Adoption

Based on the results of the study, it can be seen that hypothesis 2 is accepted, or the adoption of e-commerce by MSMEs is positively influenced by external pressure. What is meant by external pressure is the business environment, namely pressure from competition, social factors, the industry, the government, and dependance on other firms that have adopted e-commerce. The higher the encouragement from the business environment, the higher the level of e-commerce adoption will be (Yulimar, 2006). Al-Bakri and Katsioloudes (2015), Chwelos et al. (2001), Grandon and Pearson (2004), Iacovou et al. (1995), Yulimar (2006), and Lim et al. (2021) also show that the adoption of e-commerce by MSMEs is significantly and positively influenced by external pressure. These results are in line with the innovation diffusion theory which states that the adoption of innovations can be influenced by environmental factors.

The result of this study indicates that there is a need for encouragement from the business environment to encourage MSMEs to adopt and use e-commerce. The role of business partners and competition can encourage the use of e-commerce by MSMEs. Cooperation between business actors and related agencies is needed to buld a better business environment, one of which is by using e-commerce to expand the market.

The Effect of Perceived Benefits on MSME's E-Commerce Adoption

Based on the results of the study, it can be seen that hypothesis 3 is accepted, or the adoption of e-commerce by MSMEs is positively influenced by the perceived benefits. Chwelos et al. (2001), Grandon and Pearson (2004), Iacovou et al. (1995), Yulimar (2006), Chau et al. (2020), and Lim et al. (2021) also show that the adoption of e-commerce by MSMEs is significantly and positively influenced by perceived benefits. This shows that individual perceptions are important in the adoption of innovations. Rogers (2010) stated that what is important is not whether an innovation has many advantages objectively, but whether an individual perceives the innovation as profitable.

The result of this study indicates that education and socialization is needed from the government and related agencies regarding the benefits of using e-commerce fot market expansion, especially during the pandemic.

The Effect of E-Commerce Adoption by MSMEs on Increasing Operational Revenue

Based on the results of the study, it can be seen that hypothesis 4 is rejected, or the increase in operating income is not influenced by the MSMEs' e-commerce adoption. This result supports Lorca et al. (2019) which states that e-commerce types of B2B, B2C, or a combination of the two have no effect on income and there is no evidence of an increase in income when compared to companies that do not use e-commerce. This is because there is a possible substitution effect between physical sales and online sales, or most companies do not fully utilize the potential of e-commerce.

While Saridakis et al. (2018) states that three types of e-commerce, namely websites, social media, and third-party websites or marketplaces, can increase the possibility of MSME's additional income. This shows that the use of e-commerce can generate new revenue streams for MSMEs other than through physical sales.

The result of this study can be influenced by COVID-19 pandemic that is hitting Indonesia and the rest of the world. Most MSMEs experienced a decline in turnover and market demand, this was due to reduced community activities outside the home and community purchasing power (Atmaja & Novitaningtyas, 2021). In addition to using e-commerce, other innovations are needed to be able to maintain business during the pandemic and also increase operating revenue. Some things that MSMEs can do are do digital marketing through social media, bring up new product lines that can attract consumers during the pandemic, improve customer service, and ensure product cleanliness and safety (Alfrian & Pitaloka, 2020).

CONCLUSION

The results showed that the adoption of e-commerce by MSMEs was influenced by external pressure and perceived benefits, while organizational readiness had no effect on MSME's e-commerce adoption. In addition, the results of this study indicate that the adoption of e-commerce by MSMEs does not affect the increase in business income.

The result of this study indicates that there is a need for encouragement from the business environment to encourage MSMEs to adopt and use e-commerce. The role of business partners and competition can encourage the use of e-commerce by MSMEs. Cooperation between business actors and related agencies is needed to buld a better business environment, one of which is by using e-commerce to expand the market. Education and socialization is also needed from the government and related agencies regarding the benefits of using e-commerce fot market expansion, especially during the pandemic.

Based on the results of the study, it can also be concluded that the adoption of e-commerce by SMEs is not influenced by organizational readiness. This shows that the ownership of financial and technological resources by business actors cannot determine the adoption of e-commerce by MSMEs.

Furthermore, the results of the study show that the use of e-commerce by MSMEs cannot increase business income. This shows that although there is an impact on market expansion, the adoption of e-commerce may have a substitution effect between physical sales and online sales, or most companies do not fully utilize the potential of e-commerce. In addition, the condition of the COVID-19 pandemic can also affect research results due to reduced community activities outside the home and people's purchasing power. In

addition to using e-commerce, other innovations are needed to be able to maintain business during the pandemic and also increase operating revenue.

This study has limitations, namely the use of convenience sampling method as a sampling technique so that the results of the study cannot be generalized. In addition, the majority of respondents in this study are MSMEs with micro-enterprise size groups so that analysis of factors related to the e-commerce adoption by medium-sized enterprises cannot be carried out. In order for further research to be better, the researcher proposes suggestions for further research to use stratified sampling techniques so that the study results can be generalized and cover all MSME business size groups. However, in order to use this technique, researchers must know the exact number of MSMEs population so that it is necessary to provide data by the City/Regency Cooperatives and Micro Enterprises Service and the Provincial Cooperatives and SMEs Office to facilitate further research.

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