

Analysis of The Digital Technology Adoption by MSMEs Using Diffusion of Innovation

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Abstract. The empowerment of MSMEs (Micro, Small and Medium Enterprises) in in global changes and intense competition required MSMEs being strong enough to encounter demands globally and as a whole. In contrast to statistics has shown them to have little export-related activity, since they barely represented 14% of the non-oil and gas region's or sector's overall export value. This study built on the Diffusion of Innovation (DOI) Framework in order to determine the impact of digital technology in enhancing the competitiveness of MSMEs with an export focus. The method used was to analyze DOI framework factor using Structural Equation Model-Partial Least Square (SEM-PLS) method. The results of DOI models especially the technological dimension was formed by the variables complexity, relative advantage, trialability, and observability which had a straight and non-significant impact on technology adoption from export-oriented MSMEs. In the DOI model, only the trialability variable had a straight and significant relationship, even the compatibility variable had a negative and insignificant influence on the adoption of digital technology

Keywords: Adoption, Digital Technology, MSMEs, and DOI.

1. Introduction

The reinforcement of MSMEs (Micro, Small and Medium Enterprises) in in global changes and intense competition required MSMEs being strong enough to encounter demands globally and as a whole, including growth or increase in product and service innovation, development of human resources and technology, as well as an increase in promotional areas (Fernanda Putri et al., 2020). It is necessary to lift the MSME brand image, thus they able to align with goods from abroad which is spreading more and more to Indonesian industry and manufacture, considering that MSMEs are an economic sector capable of absorbing the highest labor force in Indonesia ((Widiyati & Hasanah, 2013).

The following data illustrates the low contribution of MSME export products compared to products from a sector other than oil and gas. The value of non-oil and gas industry exports in 2015-2020 was in the range of above 150-250 billion US dollars or 2100-3500 trillion rupiahs and showed that the export value of MSMEs in 2015-2019 was in the range of 200-350 billion rupiahs. According to these data, MSMEs only accounted for 14% of the non-oil and gas sector's total export value, performing a poor export contribution to the Indonesian economy. Actually, according to data produced by the Ministry of Cooperatives, the percentage of MSMEs in Indonesia was exceptionally high in 2019—99.99%—compared to the percentage of major businesses, which was just 0.01%. Due to the weak foundations for Indonesia's economic fundamentals, the government has been forced to construct and establish an economic framework while continuing to place a priority on the survival of MSMEs. The role of MSMEs to have the ability to survive and become the motor of the economy does not need to be doubted about its existence during the post-economic crisis period. On the other hand, MSMEs also encounter many problems, for example, human resources are still minimal, working capital is minimal, the ability to master science and technology is inadequate.

Digital technology has become a necessity, and is evenly distributed in every aspect of human life. This is after the discovery of computers and laptops, digital communications, smart applications, smart applications, smartphones, and intelligent systems, where currently almost all human work is related to computers or laptops, so it is appropriate to say that computers are the most important inventions. the most recent and most influential in human life. In this era of digital change, there is a great opportunity to take advantage of digital technology to optimize sales turnover or even create new products by utilizing the internet. In Indonesia, there are MSMEs that have prepared themselves for the use of digital technology by starting to appear selling on online media.

The growth of MSMEs in Indonesia is also driven by the advanced digital technology. This digital technology makes it easier for the consumer base described above to access these MSMEs (Ramdansyah & Taufik, 2017). In 2017, Indonesia's population's percentage of Internet users reached 54.68%, and the Internet penetration rate in Indonesia reached 73.7% in December 2021. The population has reached 273.87 million people on 31 December 2021 (databoks.katadata.co.id). Buying, selling, transferring, or exchange of goods, services, or electronic commerce refers to the exchange of information across computer networks, particularly the internet. E-commerce has certain advantages, like expanding marketing reach globally, lowering costs, accelerating time to market, enhancing customer service, and raising income. Businesses of all sizes, especially MSMEs, may profit from e-commerce (Triandini et al., 2013).

Information technology (IT) is now universally acknowledged as a key instrument for enhancing a nation's economic competitiveness. Everyone agrees that IT significantly affects corporate efficiency. This effect won't be felt until IT is widely used. Understanding the determinants of IT adoption is important. There are several reviews in the literature comparing individual-level and enterprise-level IT adoption models. Oliveira & Martins found that the Technology, Organization and Environment (TOE) framework identified three elements of the organizational environment that influence the adoption and implementation of technological innovation processes, namely the technical environment, the organizational environment and the environmental environment(Oliveira & Martins, 2010).

According to Setiyani & Yeny Rostiani, organizational and environmental factors have a considerable impact on the desire to adopt e-commerce whereas technology factors have little to no impact. The desire to use e-commerce is found to be significantly influenced by all technology indicators (Setiyani & Yeny Rostiani, 2021). According to Evi et.al., technology adoption is directly positively and significantly impacted by the environmental dimension, the organizational dimension, and the technological dimension. The technology dimension is supported by the relative advantage variable, trialability with a high significant value and the indicators of complexity, compatibility, and observability having a lower significant value. The organizational dimension is supported by the variable information processing needs, knowledge competence with a high significant value, and company size having a lower significant value. Finally, the environmental dimension is supported by uncertain environmental government support variables, and competitive pressures that have a high significant value (Triandini et al., 2023). According to Ghobakhloo & Ching, the decision of an MSME to use digital technology is influenced by organizational, technological, and environmental factors (Ghobakhloo & Ching, 2019). In their study employing the diffusion of innovation (DOI) model, Okour et al. found that relative advantages, system complexity, and knowledge quality had a substantial impact on users' decisions to install Knowledge Management Systems (KMS), but not system compatibility (Okour et al., 2021). Only complexity concerns had a substantial impact on the adoption of cloud computing systems (Hassan & Nasir, 2017).

Based on the background of the problem that the contribution of exports to the MSME sector is still low compared to other sectors, which is in contrast to the rapidly growing conditions of digital technology growth in Indonesia, and there is a gap in the results of technology adoption research on MSMEs in Indonesia, especially for the technological dimension with the TOE model between (Setiyani & Yeny Rostiani, 2021) research and (Triandini et al., 2023). This research will explore the influence of the technology dimension on MSME technology adoption from a review of different adoption models. So as to answer these differences, a study was designed which aims to analyze the role of digital technology in increasing the competitiveness of export-oriented MSMEs built on the Diffusion of Innovation model. The MSME research object was expanded by reviewing three regencies, namely Blitar Regency, East Java Province, Buleleng Regency and Denpasar City, Bali Province. The results of this research will reinforce the results of the influence of technology on the adoption of export-oriented MSME technology so that in the future it will contribute to improvements in the technological dimension for the advancement of export-oriented MSME in Indonesia.

2. Literature Review

2.1 MSMEs and Digital Technology

MSMEs definition varies from different countries but it usually concerns to quantifiable qualities like occupation, capital level, sales revenue, and asset. Table 1 below demonstrates how MSMEs are defined:

Table 1: MSMEs Definition

State	Definition	Dimensions
USA	Manufacturing sector has less than 500 people	Occupation and sales earnings
	Sales of the non-manufacturing industry were less than USD \$5 million.	
Vietnam	For small businesses, less than 30 employees and VND 1 billion are required.	Occupation and Capital
	Medium-sized businesses should have 30–200 personnel and capital of VND 1–4 billion.	

Indonesia	fewer than 100 workers	Occupation
Japan	For the wholesale sector, fewer than 100 workers or assets worth less than JPY 100 million	Occupation and Assets
	Less than 100 workers or assets of JPY 50 million for the service sector	
	Less than 50 workers or assets of JPY 50 million for the retail industry	
Malaysia	For the manufacturing industry, there are no more than 150 workers or MYR 25 million in assets.	Employment and Assets
	For the service industry, fewer than 50 employees or MYR 5 million in assets	

Although there isn't one definition for SMEs, there are various ways to classify them. Limited resources (money, technology, and employees), a basic organizational structure, a flexible strategy, being more adaptable to turbulence, and a tiny market share are some particular traits of SMEs. Additionally, the owner is largely responsible for the success or failure of SMEs. The owner often bases all choices on his own personality and keeps in regular contact with clients, staff members, and suppliers as a lifetime responsibility (Sastararuji et al., 2021).

Digital disruption in recent years has presented MSMEs with both possibilities and difficulties. MSMEs may more efficiently and affordably service international markets with the use of digital tools. Digital disruption, however, results in new competition laws and empowers digital disruptors to compete on value with traditional SMEs. Since these three pillars—customer insight, business strategy, and operational model—form the foundation of digital projects, SMEs are under pressure to lead them. The adoption rate of conventional SMEs for information technology (IT) is low, and the failure rate is significant. For SMEs, adopting new technologies is hampered by a lack of skilled people and digital skills (Sastararuji et al., 2021).

2.2 Diffusion of Innovation (DOI)

Diffusion processes help certain populations adopt technological advances. The diffusion of innovation hypothesis (DOI), in Rogers' opinion, shows that the following four factors affect how rapidly an idea spreads (see Figure 3). (1) the innovation itself, which refers to a concept, thing, or behavior that a person or adopting unit considers as unique; (2) the means of communication used to propagate innovation; (3) time, which is the relative speed at which individuals or groups embrace an invention or the pace of an innovation's dissemination; and (4) a social structure made up of members of the same culture or institutions that may accept the innovation (Alias et al., 2018).

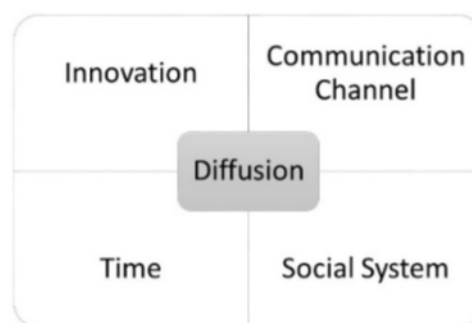


Fig. 1: Innovation spread factors

It seems sense to presume that an innovation's adoption is influenced by the level of the individual. The five stages of a private adoption were described by Rogers. Knowledge, persuasion, choice, execution, and confirmation are the five stages. People are open to innovation at the knowledge phase. Individual characteristics now have the most impact. Individuals will form favorable or unfavorable opinions of new technologies throughout the persuasive phase. People will choose whether or not to adopt a new technical breakthrough at the third stage of the innovation-decision process. People employ the invention during the subsequent phase, known as the implementation phase. The confirmation phase follows after the person has made up their mind on whether to accept or reject the innovation (Alias et al., 2018).

Rogers went on to discuss why certain technologies succeed while others are never adopted extensively. Five unique qualities are required for an innovation to be successful: observability, relative advantage, compatibility, trialability, and complexity:

- **Compatibility:** the degree to which a new technology is regarded to be congruent with the adopters' specific demands for integration into their life, prior experiences, and current values.
- **Complexity:** The degree of an innovation is thought to be somewhat challenging to comprehend and use. Users won't accept new technology because of how difficult it is to use.
- **Trialability:** The scope of an innovation's testability. Users won't accept innovations if they are difficult to use and attempt.
- **Observability:** Others can see the extent of an innovation's results. The exposure of the invention will affect how people communicate with one another in their personal networks, which in turn will affect whether or not it receives more favorable or negative feedback.
- **Relative Advantage:** An innovation's scope is deemed superior to the replacement concept (Alias et al., 2018)

According to Okour et al. (2021) research, relative advantage, system complexity, and knowledge quality have a substantial impact on the usage of Knowledge Managements System (KMS) by decision makers but not system compatibility. The results also indicate a strong correlation between knowledge quality and earlier DOI technologies. By selecting a sample of bank decision-makers, a knowledge management system (KMS) at Jordanian banks is the subject of the study. The Rogers DOI theory model, which is frequently quoted, was employed in this study to better understand how Jordanian bank decision-makers felt about utilizing KMS. The shortcomings and inclusion of Rogers' DOI theoretical model are shared by other ideas. The purpose of this work is to close a significant gap in the DOI. In instance, DOI theory ignores the "output quality" of the system in favor of examining "system quality." The results demonstrate empirically that the "output quality" of knowledge is a major predicate for the application of KMS in the context of Jordanian banks. Additionally, the majority of KMS research is conducted in wealthy nations like the United States, Europe, and Asia, each of which has its own cultural and technological traditions. As a result, the majority of these studies cannot be used in a context of impoverished countries.

In their study employing MSME research objects in Pasar Baru Bandung, Indonesia, Noviaristanti & Huda (2023) discovered that the influential variables were Relative Advantage, Compatibility, and Trialability. Due to the fact that Relative Advantage has the highest score in the structural model, it has been determined that it has the most significant impact. The Etapasbar e-commerce system is preferred by SMEs above other cutting-edge technology, which supports their business. In addition, they have experimented with this new, cutting-edge technology, which lets them determine whether to employ Etapasbar or not. They lack system operation skills. As a result, individuals are unable to inform others of the effects and advantages of adopting Etapasbar. Other technological context-related facts were also shown to be unimportant. This discovery could not have a strong ICT foundation, particularly in e-marketplaces. Additionally, CEOs or SMEs are unsure about the cutting-edge technologies they want

to implement. We get to the conclusion that because Etapasbar is situated in Bandung's new market, MSME players frequently accept it without understanding why they did so.

From the studies above, the technology adoption model still finds gaps in the initial theory of the diffusion of technology from Roger, especially to be applied to developing countries that have different qualities and cultures from the technology used.

2.3 The Research Model of The Study

Based on the previous research gaps, the model was modified to become a framework for research as shown in figure 1 below.

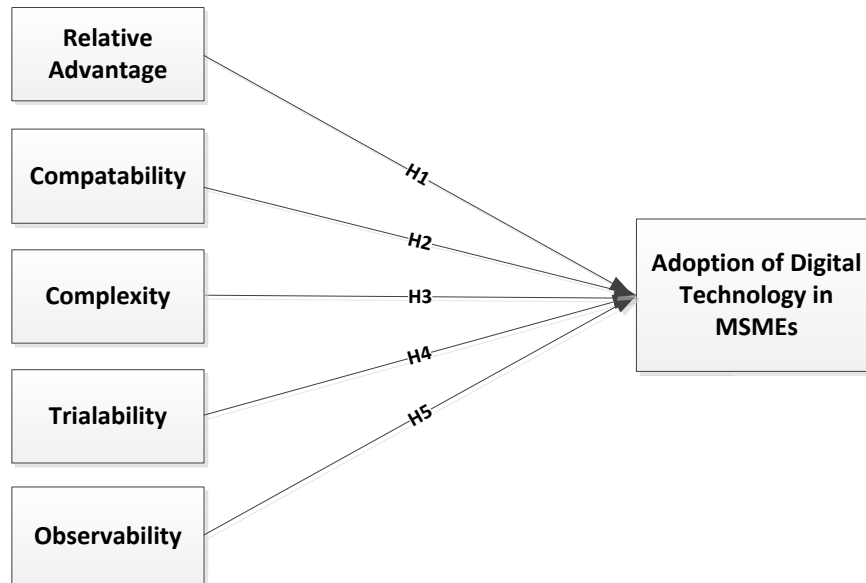


Fig. 2: Framework of thinking

From Figure 2, the framework for thinking will be compiled and carried out with research on the topic, namely to identify by examining the adoption theory of digital technology, the function of digital technology in improving the competitiveness of export-oriented SMEs. This framework will review the use of digital technology for MSMEs, especially e-commerce in terms of relative advantage, compatibility, complexity, trialability and observability towards the acceptance of e-commerce systems used by these MSMEs. So that the current situation of technology acceptance from the e-commerce system that is used will be illustrated and later the results of this study will have great benefits for MSMEs, especially in Indonesia as an effort to improve and make management decisions.

2.4 Research Hypotheses

From the study model in Figure 1, the study hypothesis can be arranged as follows:

H1: Relative Advantage is significantly influenced on the adoption of digital technology in MSMEs

H2: Compatability is significantly impact on the adoption of digital technology in MSMEs

H3: Complexity is significantly influenced on the adoption of digital technology in MSMEs

H4: Triability is significantly influenced on the adoption of digital technology in MSMEs

H5: Observability is significantly related on the adoption of digital technology in MSMEs

3. Research Method

3.1 Research Design

The design of this research is quantitative research. The workflow of this research consists of several stages as shown in the figure 3 below:

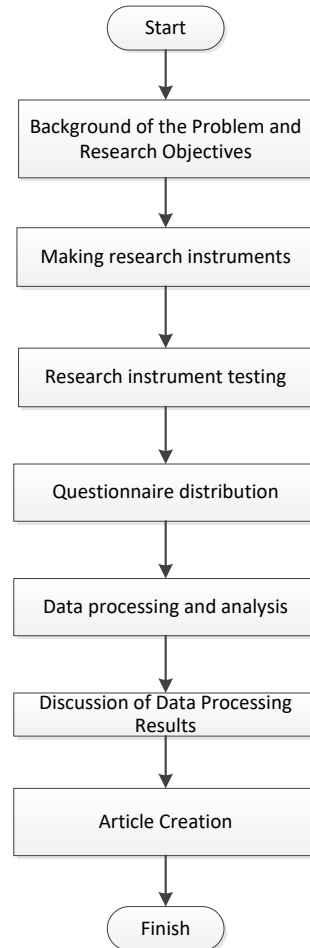


Fig. 3: The Research Workflow

3.2 Data Collection Techniques

Distribution of questionnaires was the main method of data gathering in this study. With the help of the research team, the questionnaire was sent offline to MSME management respondents in the Blitar district, East Java Province, and Bali Province, which included Badung, Gianyar, Buleleng, and Denpasar. The respondents were chosen using a purposive sample approach. This method of sampling involves choosing the sample after giving various factors some thought. The following terminology are utilized: MSME management in Blitar district, East Java Province, Badung, Gianyar, Buleleng and Denpasar, Bali Province, aged 17 years and over. MSMEs have already conducted business running with the digital technology assistance. Having export-oriented products.

3.3 Operational Definition of Variables

Explanatory research with another name, namely research according to the level of explanation used by the research framework above. The level of explanation has the meaning of explaining the position of the variable being tested and the influence between variables on other variables. This study uses research variables:

Complexity prevents invention in digital technology knowledge and application, which necessitates greater work in discovering answers via adopting innovation. (Setiyani & Yeny Rostiani, 2021).

Digital technology compatibility is the extent to which it is acceptable with respect to the infrastructure, culture, values, and working procedures that MSMEs choose (Ghobakhloo & Ching, 2019).

Trialability is the degree to which an invention can be tested on a small scale, or the more ideas that are tested, the quicker they get adopted (Christiansen et al., 2021), (Alias et al., 2018).

The term "observability" refers to the extent to which the innovation's results may be seen and seen by others (Alias et al., 2018).

Relative advantage implies how far an innovation or newness is considered superior to the idea that is substituted for the old one (Gui et al., 2020), (Stjepić et al., 2021), (Malik et al., 2021).

Latent variables or constructs were employed as the variables in this study, namely variables that cannot be directly measured. Therefore, the presence of the latent variable is measured by a statement indicator in the form of a five-level Likert scale.

3.4 Research Instrument and Instrument Test

In the implementation of the research, the initial stage was the manufacture of research instruments as a form of stages in the research process. This instrument will be the basis for making a questionnaire. The following is a questionnaire instrument statement taken from the variable indicators used:

Table 2: Research Indicators from Questionnaire

Variables	Indicators
Relatif Advantage	Digital technology already or if implemented can reduce costs to the company
	Digital technology has been or if implemented can increase the efficiency of business operations at the company
	Digital technology has or if implemented can accelerate business processes in the company
	Digital technology already or if implemented can improve the relationship with the company's customers and business partners (vendors and customers) in the company
	Using digital technology makes it easier to perform business tasks.
	The use of Digital technology allows greater control over the business
Complexity	Digital technology is easy to implement in companies
	Digital technology is easy for employees to understand in the company
	Digital technology is trusted by employees at the company
	Digital technology requires a high level of expertise for companies to implement
Compatibility	Digital technology fits into the 241rganization culture in the company
	Digital technology matches the 241rganization value in the company
	Digital technology fits into the work habits of the company

	Digital technolog should be compatible with existing enterprise technology infrastructure.
	Digital technolog should be fully integrated with enterprise information systems, software tools, and software solutions
Trialability	I intend to try out Digital technology in before deciding whether to adopt it in practice
	A trial period before adopting Digital technology will reduce the perceived risks
	Trying out Digital technology is not important in my decision to adopt
	In the trial period, I will try to transform the saved records to Digital technology
Observability	The application of digital technology to MSMEs provides convenience in observing or observing it
	The application of digital technology to MSMEs makes it easy to communicate to others
	The benefits of applying digital technology to MSMEs can be felt for others
Digital Technology Adoption	Adoption of technology facilitates access to information for export-oriented MSMEs
	Technology adoption can improve business performance for export-oriented MSMEs
	Technology adoption can improve the quality and speed of service to export-oriented MSME business partners
	Technology adoption can improve cost efficiency for export-oriented MSMEs

Testing instruments measuring all variables in this study were conveyed to respondents to be able to give statements according to what they felt and experienced. The questionnaire as an instrument must meet the main requirements, namely valid and reliable by using validity and reliability tests.

3.5 Analysis Method

A component-based technique to SEM called partial least square (PLS) was initially proposed by (Wold, 1985). While PLS aims to maximize the observed variation in the dependent variable revealed by the independent factors, covariance-based SEM attempts to replicate the covariance matrix. In addition to estimating the block variables and connections from the measurement model, PLS also estimates the structural model after calculating the measurement model (Tenenhaus, 2008).

Because it does not presume that the data must follow a specific distribution and because the number of samples is very minimal, PLS is a potent analytical technique. Because the PLS technique prefers to estimate latent variables as a linear combination of indicators, it also avoids the problem of indeterminacy and gives a clear description of the score component. All measures of variance are appropriate variances for explaining when using the PLS approach. (Jöreskog & Wold, 1982).

The route analysis model in PLS for all latent variables is composed of three sets of links. The following models can be used to estimate latent variable values: (1) An inner model (structural model) that describes the connections between latent variables; (2) an outer model (measurement model) that describes the connections between latent variables and their indicators or manifest variables; and (3) a weight relation.

4. Results

4.1 Respondent Profile

Temporary data collection has been carried out in three regencies, namely kab. Blitar (East Java), Denpasar municipality and Buleleng district, recruited 92 respondents. The following is a description of the respondent's profile which is explained by age, gender, position, year of establishment of the company, business scale, number of workers, and business commodities as shown in table 3 below.

Table 3: Respondent Profile

Characteristics	Category	Quantity
Age	20-30 years	13
	31-40 years	22
	41-50 years	32
	51-60 years	22
	>60 years	3
Gender	Man	37
	Woman	55
Position	Owner	77
	Chairman	6
	Employee	9
Long time the company has existed	1-10 years	67
	11-20 years	18
	21-30 years	6
	>30 years	1
Scale enterprises	Micro Enterprises: Maximum Assets IDR 50 Million	74
	Small Business: Asset > IDR 50 Million - IDR 500 Million	17
	Medium Enterprises: Assets > IDR 500 million - IDR 10 billion	1
Total manpower	Small business (5-19 people)	90
	Medium Business (20-99 people)	2
Commodity	Food	48
	Clothes	19
	Herbal medicine	5
	Cosmetics	1
	Handicraft	19

4.2 Instrument testing

Variable instrument of this study was measured by questionnaire delivered to respondents for gaining statements according to what they felt and experienced. Questionnaires as instruments must meet the main requirements, namely valid and reliable. The following are the results of testing the validity and reliability of the research questionnaire.

Validity Test: The value of r table $(68 - 2; 0.05) = 0.226$ compared with the value of r count was shown by the validity test with a sample of 68. If r count is greater than r table, it can be concluded that the measuring instrument used is valid. The results of the validation test can be seen in the following table 4:

Table 4. Outcome Of Validity Test

Question	r calculate	r table	Description
P01	.535**	0.226	Valid
P02	.300**	0.226	Valid
P03	.336**	0.226	Valid
P04	.578**	0.226	Valid
P05	.313**	0.226	Valid
P06	.591**	0.226	Valid
P07	.481**	0.226	Valid
P08	.543**	0.226	Valid
P09	.423**	0.226	Valid
P10	.539**	0.226	Valid
P11	.384**	0.226	Valid
P12	.554**	0.226	Valid
P13	.620**	0.226	Valid
P14	.443**	0.226	Valid
P15	.578**	0.226	Valid
P16	.747**	0.226	Valid
P17	.533**	0.226	Valid
P18	.643**	0.226	Valid
P19	.499**	0.226	Valid
P20	.530**	0.226	Valid
P21	.608**	0.226	Valid
P22	.692**	0.226	Valid
P23	.678**	0.226	Valid
P24	.609**	0.226	Valid
P25	.658**	0.226	Valid
P26	.494**	0.226	Valid
P27	.520**	0.226	Valid
P28	.471**	0.226	Valid
P29	.529**	0.226	Valid
P30	.582**	0.226	Valid

P31	.670**	0.226	Valid
P32	.578**	0.226	Valid
P33	.502**	0.226	Valid
P34	.552**	0.226	Valid
P35	.650**	0.226	Valid
P36	.511**	0.226	Valid
P37	.406**	0.226	Valid
P38	.527**	0.226	Valid
P39	.479**	0.226	Valid
P40	.545**	0.226	Valid
P41	.496**	0.226	Valid
P42	.339**	0.226	Valid
P43	.680**	0.226	Valid
P44	.617**	0.226	Valid
P45	.502**	0.226	Valid
P46	.762**	0.226	Valid

Reability Test: From table 5, the calculation of the reliability test by Cronbach's Alpha method (r count) was shown in the Cronbach's Alpha column, which was 0.941 with N of Items indicating that the number of items or the number of questions inputting in the variable view was 46. It can be concluded that the Cronbach's Alpha results for 46 data from items or 46 questions was 0.941:

Table 5: Outcome of Reability Test

Cronbach's Alpha	N of Items
.941	46

In finding whether the data can be trusted or not, it can be seen by the calculation of $r \text{ count} > 5\%$ r table, which the r count seen from the calculation result of 0.941, while the 5% r table was 0.226. From these values, it can be concluded that $r \text{ count} > 5\%$, r table was $0.941 > 0.226$, thus the data was reliable or consistent.

4.3 Measurement Evaluation (Outer Model) of the DOI

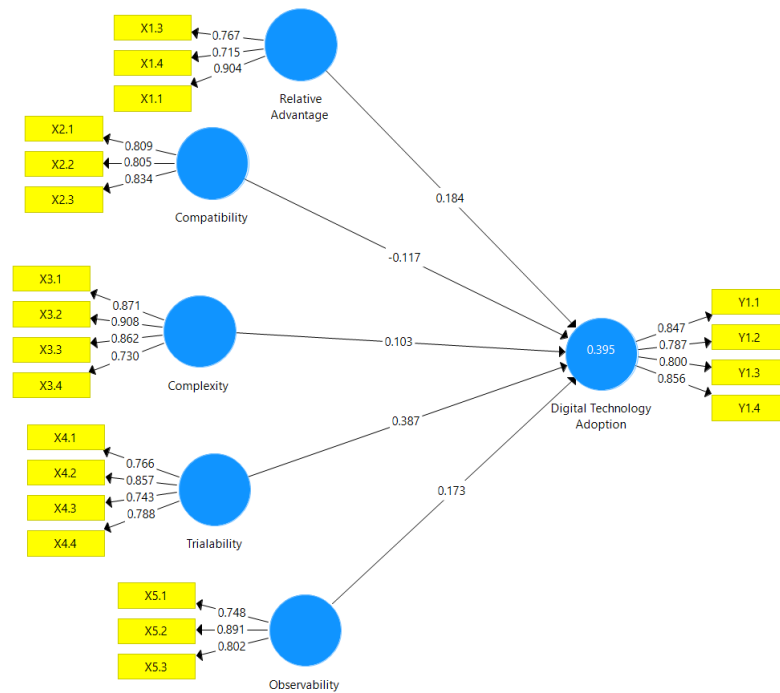


Fig. 4: Model DOI

From figure 4, the outer model is assessed using Smart PLS 3 data analysis criteria. These requirements include convergent validity, which is demonstrated by the loading factor and AVE values, discriminant validity, which is demonstrated by the cross-loading between indicators and their constructs, and reliability testing, which is demonstrated by the composite reliability and Cronbach's alpha.

The idea of convergent validity states that a construct's gauge (manifest variable) should have a high degree of correlation. The average variance extracted (AVE) value was checked, and its value was compared to the rule of thumb (> 0.50), before the loading factor value was examined and its value was compared to the rule of thumb (> 0.70). If the construct's correlation with the indicator is higher than the size of other constructs, it implies that the latent construct predicts the size of their block more accurately than the size of other blocks, which is important for discriminant validity. Additionally, reliability tests attempted to demonstrate the instrument's precision, accuracy, and consistency while measuring constructions. The reliability test was conducted by examining the composite reliability value and Cronbach's alpha value, and then comparing those values to the general guideline (> 0.70).

Table 6: Loading Factor, Average Variance Extracted (Ave), Cronbach's Alpha, And Composite Reliability For DOI

		Factor Loading	Cronbach's Alpha	Composite Reliability	AVE
Digital Technology Adoption	Y1.1	0.847	0.844	0.893	0.677
	Y1.2	0.787			
	Y1.3	0.8			
	Y1.4	0.856			
Compatibility	X2.1	0.809	0.763	0.857	0.666
	X2.2	0.805			
	X2.3	0.834			
Complexity	X3.1	0.871	0.865	0.909	0.715
	X3.2	0.908			
	X3.3	0.862			

	X3.4	0.73			
Observability	X5.1	0.748	0.745	0.856	0.666
	X5.2	0.891			
	X5.3	0.802			
Relative Advantage	X1.1	0.904	0.729	0.84	0.639
	X1.3	0.767			
	X1.4	0.715			
Triability	X4.1	0.766	0.798	0.869	0.624
	X4.2	0.857			
	X4.3	0.743			
	X4.4	0.788			

Table 6 displayed the DOI model variable testing loading factor values for each indication and had a higher value cutoff ($> 0,70$). Each variable's average variance extracted (AVE) had a value higher than the median ($> 0,50$). Additionally, Cronbach's alpha and the composite reliability test indicated that the result was above the norm ($> 0,70$).

The Fornell-Larcker Criterion approach was used to assess the discriminant validity of DOI model test indicators. You may use the Fornell-Larcker Criterion technique by contrasting the AVE's square roots with the correlation of latent particles. If the square root of the AVE value along the diagonal line is higher than the correlation between two constructs, the variable is considered to have discriminant validity. The measurement findings that the same variable's AVE root value was higher than that of other variables' AVE roots. This demonstrated the validity of the discriminant validity test's criteria.

4.4 R Square

As part of the assessment criteria for the structural model (inner model) utilizing SEM-PLS, the inner model is assessed using R-square for the dependent construct and the significant value using the bootstrapping procedure (significant threshold = 5%).

Table 7: R Square

	R Square	R Square Adjusted
Digital Technology Adoption	0.395	0.36

By looking at the R Square value for the dependent latent construct % of explained variance, the structural model or inner model was assessed. R Square's rule of thumb value was 0.75, which falls into the strong group. Other values were 0.50, which is considered moderate, and 0.25, which is considered weak.

Table 7's analysis results for testing the DOI model show that the Technology Adoption construct had a R Square value of 0.395, which indicates that the model's weak category variables Compatibility, Complexity, Observability, Relative Advantage, and Triability can explain 39.5% of the variability in decisions.

4.5 Hypothesis Test

In order to test a hypothesis, bootstrapping calculations were used to determine the value of the route coefficient from the results of the partial least squares (PLS) test.

Table 8: Hypothesis, Path Coefficients (Direct Effect), T Statistic, and P Values of DOI model validity test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Compatibility -> Digital Technology Adoption	-0.117	-0.103	0.107	1.092	0.275
Complexity -> Digital Technology Adoption	0.103	0.114	0.111	0.924	0.356
Observability -> Digital Technology Adoption	0.173	0.186	0.157	1.102	0.271
Relative Advantage -> Digital Technology Adoption	0.184	0.179	0.114	1.611	0.107
Trialability -> Digital Technology Adoption	0.387	0.367	0.123	3.146	0.002

Compatibility had a direct negative and not significant impact on the adoption of digital technology, according to table 8 of the path coefficient findings of testing the DOI model, with a significant value of $0.265 >$ from an alpha level of 5%. With a significant value of 0.353 from an alpha level of 5%, complexity showed a direct beneficial but not statistically significant influence on the adoption of digital technology. With a significant value of 0.272 from an alpha level of 5% for the influence of observability on digital adoption, observability had a directly positive and inconsequential effect on the uptake of digital technology. With a significant value of 0.115 from an alpha level of 5%, the relative advantage's influence on the adoption of digital technology had a direct beneficial effect and did not significantly have an impact. Trialability had a direct, favorable, and substantial impact on the adoption of digital technology, with a significant value of $0.115 >$ from an alpha level of 5%.

5. Discussion

DOI model result test showed compatibility had a direct negative and insignificant effect on the adoption of digital technology. This result is in accordance with the results of research by (Okour et al., 2021). Complexity, observability, relative advantage had a direct positive and insignificant effect on the adoption of digital technology. These results were consistent with research conducted (Hassan & Nasir, 2017). Trialability had a direct positive and significant effect on the adoption of digital technology. These results were consistent with research conducted (Noviaristanti & Huda, 2023).

The results in the DOI model, only the trialability variable had a significant relationship, while the relative advantage, complexity, and observability variables had a positive but insignificant effect, even the compatibility variable had a negative and not significant effect on the adoption of digital technology especially for e-commerce, digital communication, smart application, and smartphones. This is possibly caused by the possibility that MSMEs are not yet ready to accept advances in digital technology in terms of user knowledge and the immaturity of digital technology used by MSMEs in Indonesia. This is reinforced by (Okour et al., 2021) statement that cultural values and technological values cannot be equated between developed and developing countries so that Roger's DOI adoption success model cannot be applied one hundred percent to systems used in developing countries. User knowledge is also the main reason for the difference in results with Roger's DOI model. (Noviaristanti & Huda, 2023) stated in research with MSME objects in Bandung, Indonesia that e-commerce systems are preferred by MSMEs to other cutting-edge technologies that support their business. In addition, they have

experimented with this new, cutting-edge technology, which allows them to decide whether or not to use the system. They do not have system operation skills. MSME actors often accept it without understanding why they do it.

To anticipate the results of the shortcomings of this research, so that in the future similar research will be carried out as a result of comparative research, using digital technology system research objects for MSMEs in developing countries which are proven to perform well and have consumers who have good digital knowledge. This research is also a parameter for the development of digital technology advances used by SMEs in developing countries, so that in the future they can reach the level of digital technology in developed countries according to that used in the DOI model by Roger.

From the point of view of export-oriented MSME management, it can be concluded that the results of this study provide recommendations for management, to be more focused and increase the value of the variables of relative advantage, complexity, compatibility, and observability by increasing user knowledge and the right digital technology to improve the final result. For variable relative advantages, MSME management must increase HR awareness of the value of the economic benefits obtained, company prestige, and speed in working from the digital technology used. For variable compatibility, MSME management must try to increase HR confidence to use digital technology from previous practices which still used conventional methods with all the constraints. Trying to increase HR capacity in using digital technology through training that continues to get updates. From the variable complexity values, with updated digital technology training, the complexity constraints of the digital technology used will be overcome so that the technology will be easy to understand, learn and use. For variable observability, so that the application of digital technology can be accepted by MSME users, it is necessary to use digital technology that has good quality and maturity so that users do not encounter problems in the process of observing, providing references to other people and the value of benefits from the benefits of digital technology. Only the value of the trialability variable is already going well, where MSME users already have the desire to advance their business by consistently trying to use digital technology in various ways or techniques to achieve the expected goals.

6. Conclusion

Taking into account, compatibility had a direct negative and not significant effect on the adoption of digital technology in DOI model testing result. Complexity, observability, relative advantages had a direct positive and insignificant effect on the adoption of digital technology. Trialability had a direct positive and significant effect on the adoption of digital technology. In terms of export-oriented MSMEs management, it can be said that management must focus more and increase the value of the company's relative advantage, complexity, compatibility, and observability variables.

The main weakness of this research is that it only uses objects, populations and research samples from the territory of Indonesia. For the recommendations from this study to be effective, further comparative studies are needed using samples and populations from developing countries with better technology and consumers with good digital literacy. This is expected to contribute to science, especially in the theory of digital technology adoption. This research is also a parameter for the development of digital technology advances used by SMEs in developing countries, so that in the future they can reach the level of digital technology in developed countries according to that used in the DOI model.

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