



## Measurement Analysis of the Level of E-Commerce Adoption Readiness in SMEs Using Technology Readiness Index Method

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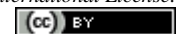
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### Abstract

The purpose of this study is to determine the extent of readiness for adoption and what factors influence readiness for e-commerce adoption. This study uses the Technology Readiness Index (TRI) model and the Information Technology Adoption Model by adding the variables of customer readiness, competitive pressure, and IT adoption. The population in this study is SMEs. The sample used from this population is 150 respondents with the purposive sampling technique. This study used quantitative methods with analysis techniques using PLS-SEM and data analysis using SmartPLS version 3.0. The results of this study indicate that six out of ten hypotheses are accepted. So that the factors that influence the readiness of e-commerce adoption are the optimism variable for the customer readiness variable, the optimism variable for the competitive pressure variable, innovativeness for the customer readiness variable, innovativeness for competitive pressure, discomfort for customer readiness, and competitive pressure for IT adoption.

**Keywords:** Adoption, Readiness, IT Adoption, SMEs.

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### 1. Introduction

We can already feel how information and communication technology (ICT) advancement has improved our ability to manage our daily tasks. ICT is being used in many industries, including business, education, health, and government. Since using technology is thought to promote productivity and efficiency at work, modern humans are heavily reliant on it. Continuous innovation is encouraged by the growth of the ICT function, which is always changing to be able to address a variety of issues that arise in daily life. ICT has an impact on how people work and interact in several industries. ICT is felt to have become a necessity for various business worlds to realise the goals and expectations they have set [1]. This is due to good information technology capabilities in processing data and information so that it can assist in making decisions quickly. This is what causes various organisations from various fields to take advantage of the existence of technology to be utilised in the business processes they implement with the expectation of more effective and efficient results. Including its use in small, and medium enterprises (SMEs). SMEs must see the benefits of e-commerce for easy and efficient market access in line with the era of globalisation that is sure to be faced. Adoption of e-commerce provides great benefits for businesses [2]. E-commerce is essential for enhancing market rivalry and product sales. Using e-commerce makes buying, selling, and marketing operations more efficient since it makes transactions easier, lowers costs, and expedites the transaction process [3]. Additionally, the data transmission quality is superior than that of a manual method, which does not do re-entry and leaves room for human error. Shopee and Tokopedia are the two largest e-commerce sites in Indonesia. The two marketplaces have the highest number of visits per month compared to other marketplaces. The Shopee and Tokopedia applications also rank first and second on the App Store and Play Store, beating other large e-commerce sites such as Lazada and Bukalapak [4]. Thus, the author will make Shopee and Tokopedia the benchmarks for e-commerce as a reference for researching the readiness of SME adoption. The majority of the 84.92 percent of enterprises that did not engage in e-commerce transactions, or 70.89 percent of them, did so because they preferred to conduct their business directly (offline). The second most common reason is that 42.52 percent of people are not interested in selling online. And the third most common reason for businesses not doing e-commerce is a lack of knowledge or expertise in e-commerce, which is as much as 21.78 percent [5].

Previous research using the Technology Readiness Index (TRI) method concluded that there are several factors that influence SMEs entry into e-commerce networks, namely regulatory support, competitor pressure, and the suitability of information technology infrastructure. Meanwhile, the support and characteristics of the leader and

the budget variables have a negative influence. The negative relationship between leader characteristics is caused by two things, namely the dominance of the role of the creative house and the lack of orders received by SMEs on the Banyuwangi-mall.com website [6]. As for the budget aspect, the absence of a special budget for SME activities in Banyuwangi-mall.com online marketing is the reason for the absence of a positive influence. Other similar studies using the TRI method conclude that e-commerce service readiness is still low. According to the results of internet adoption to promote products, only about 36.3 percent use it. When viewed from TRI, he found that innovation differed significantly between entrepreneurs who adopted the internet and those who did not. Other studies also recommend adding environmental variables to technology adoption, and two environmental factor variables are found in research, namely consumer readiness and competitive pressure, to be used as additional variables in accordance with the conditions of SMEs [7].

To determine the readiness of SMEs to adopt e-commerce into their business processes, it is necessary to examine the level of readiness using the readiness model and the adoption model [8]. The Technology Readiness Index (TRI) gauges a person's propensity to embrace and use technology to achieve goals in their personal and professional lives [9]. Individual preparedness to accept IT based on broad personality traits and supportive or discouraging circumstances for new technology is the key component in the TRI model. These are the elements that make up the Technology Readiness Index (TRI): An optimistic perspective on technology. Positivity about technology can improve life control, adaptability, and effectiveness. Innovation, namely the propensity to adopt new technologies before anyone else [10]. Discomfort, namely the feeling of being overwhelmed and unable to control the new technology. Insecurity, namely distrust of new technology for reasons of security and privacy. The four variables above are complemented by two environmental factor variables, namely consumer readiness factors and competitive pressures, so this is what distinguishes this research from previous studies [11]. The Technology Readiness Index is an index to measure user readiness for a new technology. TRI uses a series of belief statements in conducting surveys to measure the overall level of technology readiness of individuals, and is a tool in technology adoption studies. Technology readiness is the movement of psychological motivators and deterrents that determines an individual's inclination to use new technologies [12].

A measurement is a procedure or an action that establishes the amount of something. Measurement is also a process whereby we can find out and describe a person's performance using a quantitative scale, which later on in the qualitative comparison of a person's performance can be expressed in numbers [13]. The researchers stated that knowing the factors that influence a measurement can be a starting point for knowing existing gaps [14]. Measurements have two characteristics in common, namely the use of certain numbers and scales and according to certain rules or formulas. Measurement has two main characteristics, the use of certain numbers or scales according to a certain rule or formula [15]. Measurement is a way to facilitate and track progress against strategic goals. Measurement is a way to be able to monitor and track the progress of strategic objectives; therefore, measurement can be concluded as a process of systematically collecting data obtained using a certain scale and considering several aspects to track certain strategic goals.

## **2. Research Methods**

This research was conducted using a quantitative approach. Data collection for this study was carried out in two ways, namely, literature studies and questionnaires by distributing a list of questions indirectly to SMEs producers. Indirect distribution is carried out using the Google Forms feature. The demographic and statistical data analysis used in this study. Data were grouped based on gender, age, education, and a number of other factors to do a demographic study. In the meantime, a statistical processing application was used for statistical analysis of the data. Microsoft Word is used by researchers to write reports, Microsoft Excel is used to handle demographic data, and SmartPLS is used to process information from respondents that was gathered through questionnaires. PLS-SEM is the data analysis technique used in this investigation. The explanation stems from Hair et al.'s assertion that PLS-SEM should be used when conducting research that is an expansion of an existing theory. Based on the findings of the demographic analysis and statistical analysis that have been done, conclusions are reached.

## **3. Results and Discussion**

Of the 150 respondents in this study, 67 were women (44.67%). Meanwhile, there were 83 male respondents (55.33%). Respondents aged <30 years were 5 people (3.33%), aged 30–40 years were 42 people (28%), aged 41–50 years were 68 people (45.33%), and aged >50 years were 35 people (23.33%). 33 respondents (22%) had primary school education, 45 junior high school students (30%), 65 high school students (43.33%), and 7 undergraduate students (4.67%). Respondents with an IT educational background were 2 people (1.33%), and non-IT respondents were 148 people (98.67%). Of the 5 respondents who had sold online, there were 5 people (3.33%), and of the 145 who had never sold online, there were 96.67%. Respondents with income below \$100 million were 71 people (47.33%), 100–500 million were 50 people (33.33%), 500–1 billion were 14 people (9.33%), and 1–2.5 billion were 15 people (10%). Respondents who had ever sold on e-commerce were 3 people (2%) and 147 people (98%) who had never. The reason the researchers used this question was because they wanted to find out how

many SMEs have used e-commerce as a platform that supports the online buying and selling process. Respondents who had employees unable to use e-commerce applications were 123 people (82%), 1 person as many as 23 people (15.33%), and 2-3 people as many as 4 people (2.67%). Respondents who had an intense interest in using e-commerce 1x a day were 6 people (4%), 1-3x a week were 2 people (1.33%), 1x a week were 3 people (2%), 1-3x a month were 12 people (8%), and never were there as many as 128 people (85.33%). 5 people (3.33%) answered not promising, 25 people (16.67%) did not know, and 125 people (83.33%) promised. respondents who have inadequate funding constraints in marketing products through e-commerce: 12 people (8%); an unprepared workforce: 31 people (20.67%); inadequate telecommunications infrastructure: 14 people (9.33%); and a lack of experience running a business online: 93 people (62%). 11 people (7.33%) were not ready to adopt e-commerce, 4 people were unsure (2.67%), and 135 people (90%) were ready.

The t-test is run in bootstrapping mode with a two-tailed test, a significant behaviour of 5%, and a minimum t-test value of 1.96. The p value can also be used to define the significance level; specifically, the significance levels of 10% (p value < 0.1), 5% (p value < 0.05), and 1% (p value < 0.01) can be used. There are 4 out of 10 hypotheses that are rejected because they have a t-test below 1.96. These hypotheses include DCF > CPR, ISC > CRD, ISC > CPR, and CRD > ITA. The hypothesis ISC > CRD, INV > CPR, INV > CRD, and OPT > CRD has a large effect size value of 0.380, 0.290, 0.263, and 0.193, indicating that this hypothesis has a medium effect on the structure of the model. While the other six hypotheses have little effect. There are two indicators that need to be removed, namely CRD5 and INV2. Because the outer loading value of both indicators is less than 0.7, which is considered to be an undesirable number, the elimination of these two indicators is required. Testing in this study enables the structural model analysis (inner model) to proceed after deletion since the measurement (outer model) in this study complies with the requirements.

Based on the results of the structural model analysis, the t-test obtained is 4.069, indicating that H1 is accepted, which means that optimism has an influence on customer readiness. This is supported by a path coefficient value of 0.381, which means OPT has a significant influence on CRD. In addition, based on the f2 test, it obtained a value of 0.193, and q2 obtained a value of 0.065, which means that the effect of pests on CRD is small. This hypothesis is also in line with the results of previous studies, which concluded that optimism has an influence on customer readiness. This has a significant influence on the readiness of e-commerce adoption. Based on the results of the structural model analysis, the t-test obtained is 2.657, indicating that H2 is accepted, which means that optimism has an influence on competitive pressures. This is supported by a path coefficient value of 0.232, which means OPT has a significant influence on CPR. In addition, based on the f2 test, a value of 0.052 was obtained and a q2 value of 0.014 was obtained, which means that the effect of OPT on CPR is small. This is in line with previous research showing that the optimism variable has an effect on competitive pressure. This has a significant influence on the readiness of e-commerce adoption.

Based on the results of the analysis of the model structure, the t-test obtained is 4.837, indicating that H3 is accepted, which means that optimism has an influence on customer readiness. This is supported by a path coefficient value of 0.447, which means INV has a significant influence on CRD. In addition, based on the f2 test, it obtained a value of 0.263, and q2 obtained a value of 0.089, which means that the effect of INV on CRD is small. The innovativeness variable affects customer readiness. This has a significant influence on the readiness of e-commerce adoption. Based on the results of the analysis of the model structure, the t-test obtained is 6.434, indicating that H4 is accepted, which means that innovation has an influence on competitive pressure. This is supported by a path coefficient value of 0.559, which means INV has a significant effect on CPR. In addition, based on the f2 test, it obtained a value of 0.290, and q2 obtained a value of 0.109, which means that the influence of INV on CPR is small and that the innovativeness variable has an effect on competitive pressure. This has a significant influence on the readiness of e-commerce adoption. Based on the results of the structural model analysis, the t-test obtained is 2.411, indicating that H5 is accepted, which means that inconvenience has an influence on customer readiness. This is supported by a path coefficient value of 0.139, which means that DCF has a significant influence on CRD. In addition, based on the f2 test, it obtained a value of 0.042, and q2 obtained a value of 0.013, which means that the effect of DCF on CRD is small. The comfort variable affects customer readiness. This has a significant influence on the readiness of e-commerce adoption.

Based on the results of the analysis of the model structure, the t-test obtained was 0.725, indicating that H6 was rejected, which means that discomfort has no effect on competitive pressures. This is supported by a path coefficient value of 0.049, which means that DCF has no significant effect on CPR. In addition, based on the f2 test, it obtained a value of 0.002, and q2 obtained a value of 0.003, which means that the effect of OPT on CPR is small. This has no significant effect on the readiness of e-commerce adoption. This is due to the respondents' lack of knowledge about technological convenience, so discomfort is considered not to affect competitive pressure or opponents. This is supported by the path coefficient value of 0.014, which means that OPT has no significant effect on CRD. In addition, based on the f2 test, it obtained a value of 0.380, and q2 obtained a value of 0.009, which means that the effect of ISC on CRD is small. This has no significant effect on the readiness of e-commerce

adoption. This is due to the lack of knowledge of respondents on technology security, so insecurity is not considered to affect customer readiness.

Based on the results of the structural model analysis, the t-test obtained was 0.613 indicating that H8 was rejected, which means that discomfort has no effect on customer readiness, which is supported by a path coefficient value of 0.043, which means ISC has no significant effect on CPR. In addition, based on the f2 test, it obtained a value of 0.002, and q2 obtained a value of 0.002, which means that the effect of ISC on CPR is small. This has no significant effect on the readiness of e-commerce adoption. This is due to the respondent's lack of knowledge about technology security, so insecurity is not considered to affect competitive or opponent pressure. Based on the results of the structural model analysis, the t-test obtained was 1.510, indicating that H9 was rejected, which means that customer readiness has no effect on IT adoption. This is supported by a path coefficient value of 0.201, which means that CRD has a significant influence on ITA. In addition, based on the f2 test, it obtained a value of 0.020, and q2 obtained a value of 0.004, which means that the effect of CRD on ITA is small. This has no significant effect on the readiness of e-commerce adoption. This is due to the absence of the influence of customer readiness on SMEs readiness to adopt e-commerce. Based on the results of the structural model analysis, the t-test obtained is 3.691, indicating that H1 is accepted, which means that competitive pressure has an influence on IT adoption. This is supported by a path coefficient value of 0.435, which means CPR has a significant influence on ITA. In addition, based on the f2 test, it obtained a value of 0.100, and the q2 test obtained a value of 0.071, which means that the effect of CPR on ITA is small. The competitive pressure variable affects IT adoption. This has a significant influence on the readiness of e-commerce adoption.

This study combines two research models that have been used by previous researchers. Previous researchers have used a mix of these models. The research models used in this study are the Technology Readiness Index and the Information Technology Adoption Model. This model is used to measure the extent of readiness for e-commerce adoption in SMEs and consists of seven variables that are a combination of the two models. What distinguishes this research from previous studies is that the researcher added three variables, namely customer readiness, competitive pressure, and IT adoption. According to the results of this study, competitive pressure affects IT adoption. The results of this study found that optimism, innovativeness, and discomfort have an effect on customer readiness. Then optimism and innovativeness have an effect on competitive pressure, and competitive pressure has an effect on IT Adoption. So it is obtained from ten hypotheses, four of which are rejected and the other six hypotheses accepted. The four hypotheses that were rejected were discomfort and insecurity for competitive pressure, insecurity for customer readiness, and customer readiness for IT adoption, where the path coefficient and t-test were below the threshold. Some of the hypotheses accepted and rejected in this study have different results from previous studies. Differences in the results of this study could occur because the research object and the characteristics of the respondents were different from previous studies. In addition, this is also related to the readiness of e-commerce adoption in each of the various SMEs. Thus, the conclusion drawn is that this study has differences with previous studies. This is because the researcher added three variables, namely customer readiness, competitive pressure, and IT adoption. In addition to differences in research objects, online data collection is also a factor that makes the results of this study different from previous studies.

#### **4. Conclusion**

Based on the results of data processing from 150 SME respondents. As many as 135 respondents (90%) felt ready to adopt e-commerce, 4 respondents (3%) were unsure, and 11 respondents (7%) were not ready. So, it can be concluded that the readiness of SME e-commerce adoption is very good, and respondents believe that in the future, e-commerce will be the newest solution to increase their sales. Based on testing the measurement model, there was a deletion of 2 indicators out of 32 indicators in this study. Removed indicators CRD5 and INV2. Based on this, the researcher thinks that the removal of indicators is due to the use of questionnaire question items on these indicators that are not sufficiently appropriate or representative. In addition, all data was obtained online, so there was no direct companion when filling out the questionnaire, which allowed for questions that were not understood by the respondents. Based on testing the model structure, six out of 10 hypotheses are accepted. This can be seen from the t-test value  $> 1.96$ . The six hypotheses are optimism  $\rightarrow$  customer readiness, optimism  $\rightarrow$  competitive pressure, innovativeness  $\rightarrow$  customer readiness, innovativeness  $\rightarrow$  competitive pressure, discomfort  $\rightarrow$  customer readiness, and competitive pressure  $\rightarrow$  IT adoption. Of the 10 hypotheses, there are 4 that are rejected, namely: discomfort  $\rightarrow$  competitive pressure, insecurity  $\rightarrow$  customer readiness, insecurity  $\rightarrow$  competitive pressure, and customer readiness  $\rightarrow$  IT adoption. The four hypotheses do not meet the statistical value (t-test) of  $> 1.96$ . For future researchers, especially those who are interested in conducting similar research, it is expected to consider the following: Conduct research with a qualitative approach so that it can provide results from different points of view. Conducting a review of the variables from the Technology Readiness Index (TRI) model and the Information Technology Adoption Model from various literatures and adding variables related to e-commerce adoption readiness, such as the Technology Competence variable. For governments that accommodate SMEs, suggestions

from researchers are to increase the readiness factor for e-commerce adoption for SMEs by increasing their optimism about selling online and increasing innovation in marketing products through e-commerce.

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