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ANALYSIS OF FACTORS AFFECTING THE DECISION TO ADOPT INFORMATION TECHNOLOGY AND ITS IMPACT ON BUSINESS PERFORMANCE: STUDY ON MICRO, SMALL AND MEDIUM ENTERPRISES (SMES)

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ABSTRACT

Micro, Small and Medium Enterprises (SMEs) is a business unit that provides a positive contribution to the economy of the State. However, it does not necessarily give SMEs the ease and smoothness in running the business. SMEs still have problems that continue which become a challenge for the progress of its business units. Lack of skilled labor, low education levels, sources of funds, and government regulations is a problem that has long faced by SMEs. However, the biggest challenge facing SMEs is how they can maintain their position in the industry. This study aims to identify and explain the context picture technology (TECH), the context of the organization (ORG), the context of the environment (ENV), the adoption of information technology (AIT), and business performance by SMEs in Malang; knows and identifies the influence of technology on adopt Information Technology, Organization on adopt Information Technology, Environment on adopt Information Technology and adopt Information Technology on Business Performance by using the theory of Technology, Organization, and Environment (TOE), which introduced by Tornatzky and Fleischer (1990). This research uses explanatory research with questionnaires as the primary data. Primary data were obtained from questionnaires distributed to the SMEs in Malang who has a website. The sampling technique is random sampling with 50 SMEs. Analysis of the data in this study uses the Smart PLS 3.0. The results of the analysis in this study shows that technology (TECH) have a positive influence and significant impact on the adoption of information technology (AIT), organization (ORG) also has a positive influence and significant impact on the adoption of information technology (AIT), and environment (ENV) has positive and significant impact on the adoption of information technology (AIT), furthermore, the adoption of information technology (AIT) has a positive and significant impact on business performance.

KEY WORDS

Technology, organization and environment (TOE), adoption of information technology, business performance, micro small medium enterprises (SMEs).

Small Medium-sized Enterprise (SMEs) is a business unit that provides a positive contribution to the economy of the State. SMEs contribute Rp. 5,440 billion to national GDP in 2013. In addition, SMEs also greatly contribute to employment and investment. Data from the Ministry of Cooperatives and SMEs shows that SMEs provide employment for 114.14 million and Rp. 1655.2 trillion investment with a total of 57.8 million units of business. Data ideas indicate that SMEs are an important pillar in the economy of this state.

Many challenges that faced by SMEs in business. Lack of skilled labor, low education levels, sources of funds, and government regulations is a problem that has long faced by SMEs. However, the biggest challenge facing SMEs is how they can maintain their position in the industry. It is often seen are not many SMEs can continue to run their business smoothly in a long period of time. It can be seen from the turnover of SMEs is high. Data from Bank of Indonesia shows the development of SMEs in 2012 of 10.5% is much improved from the previous two years which was only 2%, in 2013 the development trend of medium enterprises decreased by 6% and back up in the next year to 14%.

The data indicates that it is difficult for SMEs to maintain their efforts in the industry compared to create a new kind of business. Therefore, SMEs need assistance from government and academia in order to solve the problems of SMEs, so that their businesses can continue to survive in the industry for today and for the future. Moreover, the presence of the ASEAN Economic Community (AEC) which creates a free trade area, make the huge number of competitors and the greater challenge for SMEs.

One solution that could help SMEs is able to continue to survive in the industry with high competitiveness in information technology. The government through the ministry of cooperatives and SMEs also realize the importance of information technology, so they make MSME based program of science and technology (science and technology) which expected to be a solution for solving the problems toward SMEs. Moreover, in this globalization era of technology, the rapid development of information technology is expected to provide a positive impact for SMEs when they can use it properly.

The problems that arise are still in low level of information technology adoption by SMEs. Ministry of Development of SMEs BI revealed that the low level of use of information technology (website and e-mail) by SMEs compared with large businesses, only 10% of SMEs that have used the website for their business activities, while more than 40% of large businesses have used the website. Based on these data it can be seen that the SMEs knowledge on information technology is likely to be low. It is a challenge for the government and other interested parties, how to create a favorable situation for SMEs by applying information technology-based environment.

Based on the background of the problems that have been described, the researcher is interested to assess how the rate of adoption of information technology by SMEs and the impact on the business performance of SMEs as well as the factors that can influence the adoption of information technology by SMEs. This study uses the theory of The Technology, Organization, and Environment (TOE), which was introduced by Tornatzky and Fleischer (1990). The theory reveals the adoption of innovations at the organizational level is influenced by three contexts namely technological context, the context of organizational, and environmental context.

THEORETICAL REVIEW

Characteristics of SMEs. Micro, Small and Medium Enterprises (SMEs) is a business unit which continue to develop until today. Micro, Small and Medium Enterprises (MSMEs) in Act No. 20 of 2008 states that micro, small and medium aims to foster and develop the business in order to build a national economy based on fair economic democracy. In Indonesia itself, there are many different views on the definition of SMEs, it is seen as a different point of total assets / capital or number of employees. Under the Law No. 20 in 2008 and the Central Statistics Agency (BPS) characteristics of SMEs can be summarized as follows:

Table 1 – Characteristics of SMEs

n/n	Total net assets / year		Number of employees
Micro	< IDR 50.000.000	< IDR 300.000.000	< 3 people
Small	IDR 50 – Rp. 500 million	IDR 300 million – Rp. 2,5 billion	5 – 9 people
Medium	IDR 500 million – Rp. 10 Billion	IDR 2,5 billion – Rp. 50 billion	20 – 99 people

Source: Law No. 20 Th. 2008 and Central Bureau of Statistics (2017).

Information Technology. IT (information technology) is a result of the convergence of computer and communication technology. Information technology is a combination of computer technology (hardware and software) to process and store information communication technology to transmit information (Martin et al., 2005 in Suyanto 2005). Information technology is growing with the support of the Internet network, so that today, business world of information technology has evolved. E-business, e-commerce and m-commerce is some form of development of information technologies which utilize the

Internet. McLeod (2008) defines e-commerce is the use of communications networks and computer to execute business processes. Kadir and Triwahyuni (2005) argues that e-commerce is any form of activity of buying and selling, marketing products, services and information which done electronically, organizations can provide e-commerce in the form of a website used to promote and distribute their products / services.

Adoption of IT. Adoption is as an appointment or acceptance of anything. Adoption of information technology means the removal or acceptance of information technology that have not previously owned or used. Tan et al. (2009) defines that the adoption of information technology as application of information and communication technology (ICT) tools including computer hardware, software, and networks required for connecting the internet. Adoption of information technology in an organization will be implemented if the organization felt need and have that information technology. Ghobakhloo (2011) mentions the other forms of e-commerce are generally adopted by SMEs consists of internet, extranet / VPN, website, electronic data interchange (EDI) and electronic funds transfer (EFT).

The Technology, Organization and Environment (TOE). Tornatzky and Fleischer (1990) in Arpaci (2013) developed a framework for adoption to the organization based on the theory of contingency organization. This framework consists of three key context that can influence the adoption of an organization, technology, and environment (TOE). TOE context can be explained as follows:

Technology (Technology). Technology can be understand into the characteristics and availability of the technology within the organization. Its main focus is on how the technological characteristics can affect adoption. Technological characteristics that may influence the adoption of information technology described by Roger (1983) which states some of the characteristics of the technology consists of relative advantage or a relative advantage which be the level of excess of an innovation (in the study of information technology), are better than before or on the things are usually done. Maduku, et al. (2015) define the relative advantage as profit expectations by SMEs deriving from the adoption and the use of mobile marketing.

Second compatibility, Roger defining compatibility is the extent to which an innovation is considered consistently with existing values, experience and needs of the organization, so that owners / managers of SMEs will adopt an information technology if they see a lack of compatibility between technology and information with their business. Third complexity defined by Roger (1983) as a level of complexity of a technology to be adopted. Hassle defined it as how far the information technology to be understood by the adopter. Lin and Ho (2011) states that a technology that has a high level of complexity will be a lot of tacit knowledge contained, so it will be difficult to comprehend, understand and share. Based on these explanations, the hypothesis in this study are:

H1: Technology affect positively and significantly to the adoption of information technology.

Organization (the Organization). Tornatzky and Fleischer's (1990) organizational context consists of two things namely the characteristics (size, structure managerial) and resources (human resources and of resource slack). The organizational context in this study is based on Tornatzky and Fleischer (1990) which refers to the first of three indicators of top management support. It s an indicator that has an important role in the adoption of information technology, because the top management is controlling the activities of the organization. The decision on the adoption of information technology and communications to employees is an important role of top management (Maduku, et al., 2015).

Both employee capability is the availability of competent employees in an organization which able to support for the adoption of information technology. Lin and Ho (2011) states that the competent employee is one of the keys to success for adopting information technology. Employees are able to use and communicate with both information technology which become an important aspect in adoption. Third financial support or financial budget is a necessary aspect in the adoption of information technology to finance the funding requirements during the adoption of information technology. Thus, the hypothesis that can be developed are:

H2: Organizational affect positively and significantly to the adoption of information technology.

Environment. Environment is an element that is outside from organization that may affect the operation of the organization. Ghobakloo et al. (2013) revealed that the shift towards the adoption of information technology can be a form of response or reaction to an event or change that originated from external environment. The first indicators of environmental context in this study is the pressure from competitors. SMEs realize that their businesses require the adoption of information technology to strengthen their competitive position within the industry in order to continue to compete with other businesses. MacKay, et al. (2014) and Pearson and Grandon (2006) agrees that SMEs will consider the adoption of information technology is a must so that their businesses remain competitive and innovative products to the sustainability of their businesses.

Another indicator is the pressure from customers that the degree of pressure from customers perceived by SMEs. Customers as those associated with the SMEs have the power to encourage the adoption of information technology by SMEs. Relationships such as commitment, encouragement and coercion that comes from customers, trust and interdependence between customers and SMEs is a customer role in encouraging the adoption by SMEs (Rui 2007 in Maduku, et al., 2015).

The last indicator is the external IT vendors, the existence of external IT vendors can influence the adoption of information technology by SMEs. SMEs have limited skilled human resources and financial resources to support the adoption of information technology. Thus, the presence of external IT vendors provides an opportunity for SMEs to be able in adopting information technology, since SMEs need an expert and experienced to understand and study information technology which will adopt them.

Based on these explanations, then the hypothesis can be developed as follows:

H3: Environment influence positively and significantly to the adoption of information technology.

Business Performance. Business performance is a measure of success or achievement by an organization or business entity after the various activities. Wu, et al. (2003) revealed that business performance can be measured through efficiency, sales performance and customer satisfaction. Some studies state that the adoption of information technology influence the business performance. Setiowati, et al., (2015) said that the adoption of ICT (Information and Communication Technology) have an effect on the ability of marketing and business performance by SMEs in Indonesia. Wu, et al. (2003) study revealed that the intensity of e-business adoption have effect on business performance. Thus, the hypothesis that can be developed in this study are:

H4: Adoption of Information Technology in a positive and significant effect on business performance.

METHODS OF RESEARCH

This study consist of five variables study, namely technology, organization, environment, adoption of information technology, and business performance. Each variable composes several indicators, measured by relative technological advantage, compatibility and complexity. Organizations are made up of top management, financial support, and the ability of employees and measured by the external environment IT vendor, competitor pressure, and pressure customers. Adoption of information technology are measured through communication and order taking. Business performance consist of efficiency, selling performance and customer satisfaction. Overall, indicators measured through some items that builds upon previous studies that have been validated and associated with the adoption of information technology, using a Likert scale ranges from the most negative to the most positive (scale 1-5).

This type of research is the explanation / explanatory quantitative approach. The study population was SMEs that have used information technology in particular websites which are in the city of Malang. Mechanical sample selection was conducted using random sampling

with 50 samples studied, the target respondents are owners / managers of SMEs. Source of the data obtained in this research comes from the primary data. The primary data obtained directly based on respondents' answers to questionnaires to SMEs. Questionnaires were obtained from SMEs as a whole have been met and in accordance with the needs of research, so it deserves to be continued to the level of data analysis. The following research framework:

Figure 1 – Research Framework

RESULT AND DISCUSSION

Data analysis techniques in this study using partial least square (PLS) analysis tool SmartPLS 3.0. Analysis of the data by PLS consists of two stages of the evaluation of the measurement model (outer model) and the evaluation of the structural model (inner model).

Evaluation of Outer Model. Evaluation of outer model consists of three criteria: convergent validity, discriminant validity and reliability of composite. In the calculation of convergent, the minimum criteria of validity is 0.50, (Chin in Ghazali, 2014). Discriminant validity was measured by comparing the square root of AVE for each construct with the correlation between the constructs in the model. Discriminant validity was good that the square root of the AVE for each construct is greater than the correlation between the constructs in the model. If the root value AVE is higher than the correlation between the constructs, then good discriminant validity has been reached. The next test for analyzing outer reliability models is to look construct latent variables are measured by two criteria: reliability and Cronbach alpha compositing of block indicator that measures the construct. Constructs is claimed reliable if the value of composite reliability and Cronbach alpha values are above 0.70. Here are the results of composite output reliability and Cronbach alpha:

Table 2 – Composite Reliability and Cronbach Alpha

Variable	AVE	Composite Reliability	Cronbachs Alpha
X1	0.5992	0.9504	0.9424
X2	0.596	0.9414	0.9309
X3	0.5867	0.9337	0.921
Y1	0.762	0.9504	0.9368
Y2	0.678	0.9545	0.9471

Source: PLS (2017).

Information: X1= technology, X2= organization, X3= environment, Y1= adopt of IT, Y2= business performance.

Based on the table above, it can be seen that the outer models have met the criteria of discriminant validity which proper with AVE value above 0.5 and construct claimed reliable, because it has met the composite value of reliability and Cronbach alpha above 0.70.

Evaluation of inner models. Testing inner structural model or models made to look at the relationship between constructs a significance value and R-square of the research

model. Structural models were evaluated using R-square to construct dependent t test and significance of the coefficient parameters of structural lines.

Source: SmartPLS (2017).

Figure 2 – Structural model (Inner Model)

Tests on the structural model is done by looking at the value of R-square is a test for goodness-fit model.

Table 3 – R-Square

Variabel	R-Square
Y1	0.7969
Y2	0.5126

Source: PLS (2017).

Table 3 shows the R-square value for the variable of IT Adoption at 0.7969. R-square value indicates that 79.69% variable of IT Adoption (Y1) can be affected by variables of Technology (X1) Organization (X2), and environmental (X3). While the remaining 20.31% influenced by other variables outside studied. R-square value of 0.5319 indicates business performance variable (Y2) is influenced by the technology variables (X1), Organization (X2), the environment (X3) and adoption of IT (Y1) amounted to 51.26%, while the remaining 48.74 % influenced by other variables outside studied.

Further evaluation is done by the PLS model predictive relevance Q2 is used to measure how well the observed values generated by the model and parameter estimation. Q2 predictive value relevance can be obtained by the equation:

$$Q^2 = 1 - [(1-R^2) (1-R^2)] = 1 - [(1-0,7969) (1-0,5126)] = 1 - 0,09899 = 0,9010$$

Based on these calculations, shows the model has predictive relevance for Q2 obtained value > 0, ie 0.9010 and includes powerful category (Ghozali 2014).

In the PLS statistical testing every relationship hypothesized done using simulations carried out by the bootstrap method to the sample. Testing with bootstrapping is also intended to minimize the problem of abnormalities of research data. The test results with bootstrapping can be seen in Table 4:

Table 4 – Path Coefficient

Variable	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STERR)
X1 -> Y1	0.1958	0.091	2.1514
X2 -> Y1	0.3801	0.1712	2.2197
X3 -> Y1	0.3778	0.1715	2.2035
Y1 -> Y2	0.716	0.1064	6.7262

Information: X1= technology, X2= organization, X3= environment, Y1= adopt of IT, Y2= business performance.

The significance of the estimated parameters provides very useful information about the relationship between the variables of the study. The bases used in testing the hypothesis is the value contained in the output result for inner weight. Hypothesis testing can be done by comparing the t-statistic with t-table. T-table can be obtained from 50 respondents who eventually obtained amounted to 1,960 t-table. It can be concluded that the analysis of hypothesis testing is H1, H2, H3 and H4 accepted.

Hypothesis 1 states that technology (X1) has a positive and significant impact on the adoption of information technology (Y1) with a path coefficient value of 0.1958 and 2.1514 for the t-statistic greater than t-table (1,960) or $p \leq 0, 05\%$. This indicates that the better technology, the faster adoption of information technology by SMEs. The results showed that the characteristics of the technology which consist Relative advantage, compatibility and complexity are factors that influence the decision of SMEs for the adoption of information technology. The creation of new opportunities such as the expansion of markets, improvement of service quality, suitability of information technology with business needs a high impact factor that is found coming from technological context. In addition, although the owners / managers of SMEs realize that the level of complexity of information technology is quite high, but it does not become an obstacle to their efforts to keep adopting information technology. The results of this study are consistent with Ramdani, et al. (2013) which states that the technology has a significant influence on the adoption of enterprise application (EA).

Hypothesis 2 states that the organization (X2) has a positive and significant impact on the adoption of information technology (Y1) with a path coefficient value of 0.3801 and the value of t-statistic of 2.2197 is greater than t-table 1.960 and significant or $p \leq 0.05\%$. The statistical results indicate that the better the organization, the faster adoption of information technology by SMEs. The results of this study confirmed the results of previous studies which stated that the organizational context influence the decision of adoption of information technology (Maduku, et al., 2016; Rahayu and John Day, 2015; Ramdani, et al., 2013; Ghobakhloo, et al., 2011) , Top management, financial support, and employee capability is a factor of the organizational context found influential in information technology adoption decision. Top management is a factor that was found to have a strong influence in the adoption, it because top management is the key holder control over decision-making in business. This study found that the adoption decision of information technology is faster when the technology of *top management* constantly encourages business and employees to adapt with the development of technology.

Hypothesis 3 states that the environment (X3) has a positive and significant impact on the adoption of information technology (Y1). Statistical analysis showed the path coefficient value of 0.3778 with a t-statistic value of 2.2035 which is greater than t-table 1.960 and $p \leq 0.05\%$. These results indicate that the higher pressure and encouragement from the environment is the faster adoption of information technology by SMEs. The results of this study are consistent with previous studies that reveal the context of an environment consisting of external IT vendors, competitive pressure and customer pressure which influence the decision of information technology's adoption (Kurnia, et al., 2013; Maduku, et al., 2013; Ramdani, et al., 2015; Ghobakhloo, et al., 2011). The results of this study indicate that the indicator of competitive pressure has a strong influence on the decision on information technology adoption by SMEs. Intense competition in the industry will provide SMEs concern at the seizure of their customers by competitors. It became an enormous boost for SMEs to adopt information technology as a form of a strategy to retain customers.

In addition, the information technology SMEs can meet the demands and needs of their customers.

Hypothesis 4 states that the adoption of information technology (Y1) has a positive and significant impact on business performance (Y2). It can be known based on the statistical analysis that shows the path coefficient value of 0.716 and the t-statistic of 6.7262 which greater than t-table 1.960 and significant or $p \leq 0.05\%$. These results indicate that the better adoption of information technology is the better the performance of business generated. The results of this research found that the website owned by SMEs have a broad scope. Website used by SMEs have been able to fulfill the functions of marketing, which is the SMEs through the website has been able to make buying and selling and servicing customers directly, so that SMEs have a website that is not only as a tool for product promotion. The intensity of the adoption of the website is a good effect on business performance, cost efficiency, increase sales performance and increasing customer satisfaction is the impact of the adoption of information technology by SMEs. Through the website of SMEs, we could see the market expansion and increased sales volume from the previous. The results are consistent with research Setiowati, et al. (2015) which states that the adoption of ICT by SMEs in Indonesia influence marketing capabilities and the impact on performance improvement and financial performance.

CONCLUSION

Based on the analysis of research either descriptively or by calculation using the Smart PLS described in the previous chapter, we can have some conclusion as below:

Relative advantage, compatibility and complexity found as factors of technology that can affect the adoption of information technology by SMEs. Relative advantage is an indicator which becomes a factor that had much effect on IT adoption. It felt the creation of opportunities, improvement of service quality and the image perceived by SMEs' benefit from information technology. However, there are something interesting founded by the researchers in this study ; the first prominent thing is the assessment of SMEs to the technology which compatible for the information technology to the needs of SMEs.

Organization in this study was measured by the top management, financial support, and employee capability. The results of the research organization have a strong influence in the adoption of IT. Based on the analysis and discussion conducted found that top management encouragement to adopt information technology to businesses and employees, as well as encouragement to continue for observing the development of information technology to the business are factors that also affect the adoption of information technology by SMEs.

External IT vendors, competitive pressure, and customer pressure was found as a factor of the environment which may affect the adoption of information technology. The owners / managers of SMEs in Malang thought that pressure from competitors is a factor that greatly affects them in the adoption of information technology. The owners / managers of SMEs realize that the intense competition in the industry will allow their customers grabbed by competitors if they do not adopt a business unit of information technology.

The results of this study revealed that the majority of SMEs in Malang has adopted information technology in the form (website) very well. The intensity of the information technology's adoption by SMEs in Malang also could be categorized either. It can be seen from the scope of information technology that has been adopted. Based on the research that has been done, the researchers found that the majority of information technology adoption by SMEs has had considerable technology coverage. SMEs have been able to manage communication and transactions through information technology (website) were adopted.

Adoption of information technology in this study was found to have a positive and significant impact on business performance. This indicates that there is better information technology adoption by SMEs and better performance of business generated. This study reveals that the perception of the owners / managers of SMEs in Malang on customer satisfaction is the perceived impact of the adoption of information technology.

LIMITATION AND SUGGESTIONS

Based on the research that has been done and the results obtained, hereby some advice that can be given by researchers, among others, as follows:

This study has a sample size of 50 SMEs, the limited number of samples led to research involving SMEs with three (3) different types of industries without comparing the level of adoption in each industry. It is expected for further research can compare the level of information technology adoption among their respective industries.

This study only tested the impact of the adoption of information technology on business performance as measured by business performance proxy of marketing performance. It is expected for the next research which can analyze the performance of marketing business and financial.

This study found that there are indicators of the characteristics of the old SME adoption that may affect the relationship between the adoption of information technology with business performance. Future studies are expected to develop a conceptual model of this study in order to obtain broader results.

For SMEs, information technology is one aspect that has a very good influence for increasing competitiveness in recent's technology era. So, expect for SMEs may continue to use and upgrade of information technology that has been adopted in order to improve the competitiveness of businesses and SMEs which can continue to survive in the industry.

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