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READINESS TECHNOLOGY AND SUCCESS MODEL INFORMATION TECHNOLOGY IN IMPLEMENTATION BETWEEN SMEs IN JAKARTA

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Abstract—*In general, information technology plays an essential role in organizational development. Similarly, if the advancement of information technology can be applied to the financial sector, small and medium enterprises, and so on, the sector's selling value will increase. This study was carried out to determine the level of readiness of the SMEs sector in carrying out information technology implementation projects in business management. In this case, the researcher is developing a research model by combining and adapting a technology readiness model and a successful model for developing information technology for SMEs in Jakarta. This quantitative study included 226 SMEs workers and managers. The data was processed and analyzed using the PLS-SEM method and SmartPLS 3.0 software, with descriptive data being entered into a spreadsheet application. The study also describes the findings of the readiness factor, which has a significant impact on the success of information technology development in Jakarta SMEs.*

Keywords*: SMEs, Readiness Technology, Succes Model, SEM.*

Intisari—Secara umum, pemanfaatan teknologi informasi memegang peranan penting dalam pengembangan organisasi. Demikian pula jika kemajuan teknologi informasi dapat diterapkan pada sektor keuangan, usaha kecil menengah, dan sebagainya, maka nilai jual sektor tersebut akan meningkat. Kajian ini dilakukan untuk mengetahui tingkat kesiapan sektor UMKM dalam menjalankan proyek implementasi teknologi informasi dalam manajemen bisnis. Dalam hal ini peneliti sedang mengembangkan model penelitian dengan menggabungkan dan mengadaptasi model kesiapan teknologi dan model keberhasilan pengembangan teknologi informasi terhadap perkembangan UKM di Jakarta. Studi kuantitatif ini melibatkan 226 pekerja dan manajer UKM. Data diolah dan dianalisis menggunakan metode PLS-SEM dan software SmartPLS 3.0, dengan data deskriptif dimasukkan ke dalam aplikasi spreadsheet. Kajian ini juga memaparkan temuan faktor kesiapan yang berpengaruh signifikan terhadap keberhasilan pengembangan teknologi informasi di UKM Jakarta.

Kata Kunci*:* SMEs, Readiness Technology, Succes Model, SEM.

INTRODUCTION

The modern Micro, Small, and Medium Enterprises (SMEs) economic environment dominated by globalization, intense competition, and the knowledge and information revolution have revolutionized how business is run. The age of technology is seen in the way of intensive investment in the process of using computers and data preparation tools in the manufacturing and service industries as well as telecommunications infrastructure, and the spread of their use in government agencies, educational organizations, and more recently, in households (Ali & Miller, 2017; Buchalcevova, 2015). Therefore technological advances, the implementation, and application of information technology (IT) is a significant driving force behind many socio-economic changes in the current state of the world (Antonelli & Fassio, 2014).

As IT utilization and commercialization become more widespread worldwide, the adoption of new IT can generate new business opportunities and various benefits. Currently, large organizations and SMEs are looking for ways to strengthen them to gain competitive and efficient positions and increase their productivity (F. M. Cesaroni, Consoli, & Sentuti, 2011). Correspondingly, there is an increasing awareness of the need to earn profits through investments in IT management.

The use of IT tools greatly helps SMEs by providing the necessary infrastructure to provide the correct information at the right time. IT can also give SMEs competitiveness through integration between supply chain partners and inter-organizational functions and by providing critical information (Burgess & Paguio, 2016).

However, previous IT literature has shown that only a few studies have focused on IT adoption and use in SMEs (Burgess & Paguio, 2016; F. Cesaroni, Consoli, & Demartini, 2010). Moreover, it has been found that although IT is growing exponentially in SMEs, the rate of IT adoption by these businesses remains relatively low (Barba-Sánchez, Martínez-Ruiz, & Jiménez-Zarco, 2007; Sani & Wiliani, 2019; Skoko, Buerki, & Ceric, 2007), and Large organizations have benefited over SMEs in IT-supported sales increase and cost savings (Sani, Rahman, Nawaningtyas, Budiyantara, & Wiliani, 2021).

Although it has a very strategic role in economic growth in Indonesia, the SMEs sector can be in a worrisome condition. The era of open free markets such as the ASEAN Free Trade Area (AFTA), which will threaten the existence of SMEs if their products cannot compete with foreign products, is another reason. To overcome this, SMEs need innovation in the entire network of activities or business processes to provide added value or excellence to the products/services offered. One way to innovate is to utilize technology, especially Communication and Information Technology (ICT) (Eze, Olatunji, Chinedu-Eze, & Bello, 2018; Ntwoku, Negash, & Meso, 2017); in other words, the use of information technology (IT) can facilitate SMEs in the innovation process. The application of the rapid use of IT provides tremendous potential and opportunities that can help solve SMEs problems due to various limitations (Napitupulu, Syafrullah, Rahim, Abdullah, & Setiawan, 2018; Sani, Wiliani, Budiyantara, & Nawaningtyas, 2020).

Several performance studies on the use of ICT in several organizations Almajed and Mayhew (2014); Hughes, Rana, and Simintiras (2017); (Jrad & Sundaram, 2015) show the failure of technology development, although technically successful, its implementation is not necessarily as profitable as initially planned. In practice, several researchers also found that efforts to implement ICT have not been implemented in several SMEs in the medium and small categories. On the other hand, technology will look more optimal for organizations such as Perusahaan Terbatas (PT), both in terms of operational support, management, and strategies to achieve a global vision. Therefore, this study is proposed to explore the readiness and success of the implementation of information technology, especially SMEs, and to determine the factors that influence its readiness and success. It is hoped that the findings of this research and contributing theoretically to integrating IS readiness and success models methodically can encourage methodological diversity in IS research; Practicality is expected to be one of the decision-making materials for SMEs stakeholders and similar companies. The research objectives are to find out the status of readiness and success of the implementation of ICT, especially for SMEs that are used as respondents and evaluate the factors that influence the readiness and success of the implementation of the use of ICT. In this study, the model applied is a combination of the technology readiness model (Colby, 2016; Parasuraman, 2000) with the information system success model (DeLone & McLean, 2003)

MATERIALS AND METHODS

Quantitative research methods are research methods based on the philosophy of positivism, used to examine specific populations or samples, data collection using research instruments, data analysis is quantitative or statistical, intending to test established hypotheses (Creswell, 2014; Sugiyono, 2018).

The research approach and strategy were chosen because they can accommodate aspects of

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complementarity, development, confirmation, compensation and diversity of research methods (Venkatesh, Brown, & Bala, 2013) to ensure the validity of the results. The population in this study were SMEs entrepreneurs who had been involved or had knowledge of the use of information technology.

Data collection techniques were carried out using data collection techniques simultaneously between questionnaires, interviews, and direct discussions in one data collection period. The questionnaire was conducted directly and indirectly using the google doc application for ease, efficiency, and effectiveness. Researchers will also conduct interviews (interviews) with several participants and conduct FDG (Forum Group Discussion) on several SMEs. Interviews and FGDs were conducted to dig deeper into data that were not touched when the questionnaire was conducted (Wilson, 2012).

The following is a picture of the research methodology that will be carried out:

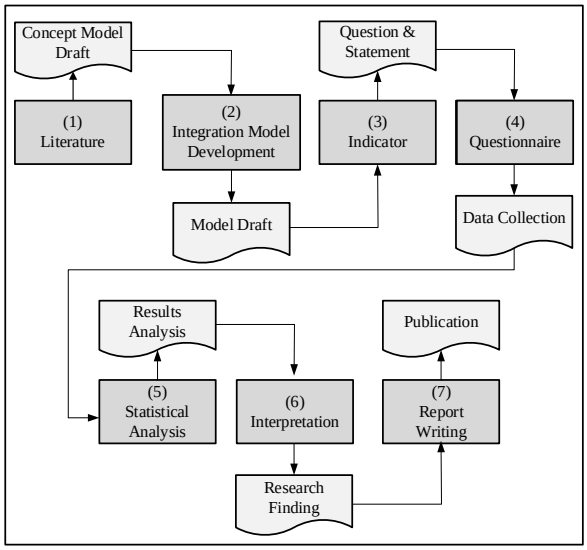

Figure 1. Research Procedure

The research instrument that will be carried out in this study is distributing questionnaires using 5 Linkert scales starting from "Strongly Disagree" to "Strongly Agree". The instrument displayed consists of a cover letter page for research, a research summary page, a research question page which will consist of 56 questions with details of 4 questions about the respondent's profile, 7 questions about IT usage profiles and 45 questions for testing the questionnaire. This questionnaire is a development of the previous research questionnaire.

After the data collection stage, the collected data will be processed into a computer, filtering and classifying the data using MS. Excel and IBM SPSS version 24. Quantitative data will then be analyzed using multivariate-based statistical methods (PLS-SEM) with SmartPLS version 3.0 software. In particular, the interpretation of the findings of the two methods will then be interpreted by confirming the quantitative findings following meta-inference from validation (Venkatesh et al., 2013).

RESULTS AND DISCUSSION

Referring to the indications of several previous students, the researchers combined the technology readiness index model (Parasuraman & Colby, 2015) and the IS success model in the context of the input-process-output (DeLone & McLean, 2003; Subiyakto & Ahlan, 2014) modelling process, as done by several previous researchers to develop a model of readiness and successful implementation of information technology adoption in SMEs. The results of previous studies were also considered in developing this research model. Figure 2 shows the model used, which consists of four system readiness variables, namely: optimism (OPT), innovativeness (INV), discomfort (DCF) and insecurity (ISC), and combines them with five variables of the IS success model, namely information quality (INQ), system quality (SYQ), service quality (SVQ), user satisfaction (USF), and IS success (ISS).

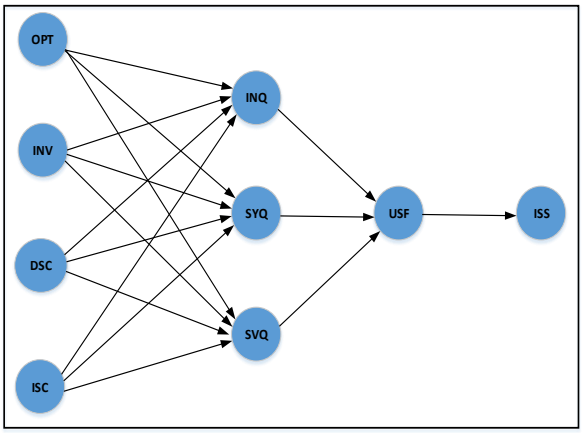

Figure 2. Research Model

This data analysis was carried out on respondents' answers, especially to the first eight questions in the questionnaire, to produce demographic information related to the characteristics of respondents and (Table 1) the status of successful implementation of information technology in SMEs that became the object of research (Table 2). The technique calculates the percentage of respondents' answers using Microsoft Excel 2013.

Based on Table 1. Regarding demographic information on respondents' profiles, we can see that most of the respondents (89.8%) have a bachelor's degree or above, with the highest

percentage (65.5%) of the total respondents being undergraduate graduates.

Meanwhile, the level of experience of respondents regarding their involvement in information technology development projects in their companies shows that the majority of respondents (85.9%) have experience under ten years, and most of them (45.3%) have experienced between 5-10 years in information technology development projects. Finally, for the type of position of the respondents in this project, the highest percentage of respondents (58.1%) are members of the development project team, the rest are top managers, business managers, staff and employees.

Table 1. Respondent Profile

Status	Responded	Percentage
Education	SLTA	10.2
	D3	15.7
	S1	65.5
	S2	8.6
Project Experience	< 2 years	16.8
	2 – 5 years	23.8
	5 - 10 years	45.3
	> 10 years	14.1
Position	Top Manager	13.0
	Business Manager	28.9
	Employees	58.1

Furthermore, the following are four main points related to the demographic information of the IT implementation profile at the SMEs that is the object of research. First, most of the respondents (69.1 %) indicated that the objective of developing an IT implementation project was to meet operational needs. Second, more than 66.8 % of the respondents said that the institution's internal development team carried out the IT development implementation strategy. Third, in the aspect of IT Implementation project funding, more than 87.9 % of the respondents stated that internal sources funded the IT project, and fourth, the majority of respondents (78.3 %) indicated the success rate of the IT Implementation was above 50%. 43.4 % of respondents stated above 75%.

Table 2. IT Implementation Profile

Measurement	Responded	Percentage
Development Goal	Operational Needs	59.1
	Managerial Needs	12.4
	Strategies Needs	21.2
	Operational & Managerial Needs	7.3
IT Implementation Strategy	Tools and Equipment 100% prepared	12.5
	Tools and Equipment 50% prepared	20.7
	Tools and Equipment 100% self-developed	66.8
Financial	100% self-financing	55.5
	50% self-financing	32.4
	100% external-financing	17.9
Level of Success	< 50%	23.7
	50 – 75%	32.9
	> 75%	43.4

Measurement Model Analysis Results

Evaluation of the outer model with reflective indicators can be assessed through convergent validity and discriminant validity. The loading factor value is said to be high if it is more than 0.7 and is usually done for confirmatory research. The loading factor value is 0.6 – 0.7 for exploratory analysis. And for the initial analysis, the value of 0.5 – 0.6 is still considered sufficient (Hair, Ringle, & Sarstedt, 2011; Hair Jr, Hult, Ringle, & Sarstedt, 2016). From the results of the analysis of the SmartPLS application, the convergent validity value is smaller than 0.6 in 10 of 45 indicators (Table 3)

Table 3. Outer Loading

Var	Ind	Cross Loading			
		OPT	INV	DSC	ISC
OPT	OPT1	Reject			
	OPT2	0,754			
	OPT3	Reject			
	OPT4	0,818			
	OPT5	Reject			
INV	INV1		0,791		
	INV2		0,792		
	INV3		0,864		
	INV4		0,861		
	INV5		0,839		
DSC	DSC1			0,908	
	DSC2			0,887	
	DSC3			0,828	
	DSC4			0,782	
	DSC5			0,838	
ISC	ISC1				0,813
	ISC2				0,908
	ISC3				0,912
	ISC4				0,850
	ISC5				0,839

Source: (Sani, Aisyah, Budiyantara, Doharma, & Hindardjo, 2022)

Table 4. Outer Loading

Var	Ind	Cross Loading				
		INQ	SYQ	SVQ	USF	ISS
INQ	INQ1	0,797				
	INQ2	0,852				
	INQ3	0,866				
	INQ4	0,858				
	INQ5	0,755				
SYQ	SYQ1		0,770			
	SYQ2		0,899			

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Var	Ind	Cross Loading				
		INQ	SYQ	SVQ	USF	ISS
	SYQ3		0,858			
	SYQ4		0,884			
	SYQ5			Reject		
	SVQ1			0,770		
	SVQ2			0,899		
SVQ	SVQ3			0,858		
	SVQ4			0,884		
	SVQ5			Reject		
	USF1				0,905	
	USF2				0,750	
USF	USF3				0,922	
	USF4				0,921	
	USF5			Reject		
	ISS1					0,929
	ISS2					0,925
ISS	ISS3					0,933
	ISS4					0,915
	ISS5					0,827

Source: (Sani et al., 2022)

Table 5. Construct Reliability & Validity

	Cronbach's Alpha (CA)	Composite Reliability (CR)	Average Variance Extracted (AVE)
OPT	0,726	0,822	0,586
INV	0,887	0,917	0,689
DSC	0,904	0,928	0,723
ISC	0,918	0,937	0,749
INQ	0,884	0,915	0,684
SYQ	0,781	0,862	0,589
SVQ	0,800	0,861	0,563
USF	0,857	0,898	0,652
ISS	0,946	0,959	0,823

Source: (Sani et al., 2022)

Based on the table above, it can be seen that on the outer loading, six indicators were rejected, namely OPT1, OPT3, OPT5, SYQ5, SVQ5 and USF5.

Internal consistency reliability was tested using the CR value with a threshold value above 0.7 (Afthanorhan, 2013; Hair et al., 2011; Hair Jr et al., 2016). Referring to several researchers above, we use the CR value instead of the Cronbach's alpha (CA) value because of the assumption of CA, which assumes that all indicators are the same in a variable. It is not for internal consistency reliability testing. The result is that the CR values of all variables have met the statistical requirements for use.

Convergent validity was tested using the average variance extracted (AVE) value with the accepted threshold above 0.5 (Hair, Sarstedt, Ringle, & Mena, 2012; Hair Jr et al., 2016; Urbach & Ahlemann, 2010; Wong, 2013). The result is by removing the OPT1, OPT3, and OPT5 indicators because their removal affects the AVE value of the OPT variable.

Discriminant validity was tested through a comparative analysis of cross-loading with the squared value of AVE (Afthanorhan, 2013; Hair et al., 2011; Hair et al., 2012; Urbach & Ahlemann, 2010; Wong, 2013). Table 5 shows the validity of all the variables used in the research model.

In summary, the measurement analysis of the model above shows that the proposed research model has good psychometric characteristics statistically even though the elimination of six indicators (IOPT1, OPT3, OPT5, SYQ5, SVQ5 and USF5). Furthermore, this can be interpreted that the model meets the requirements to be continued for testing the model structure.

Structural Model Analysis Results

This analysis was carried out through two stages of testing, including path coefficient testing (β) and a t-test using the bootstrapping method. Graphically, the results show in table 6 and figure 3.

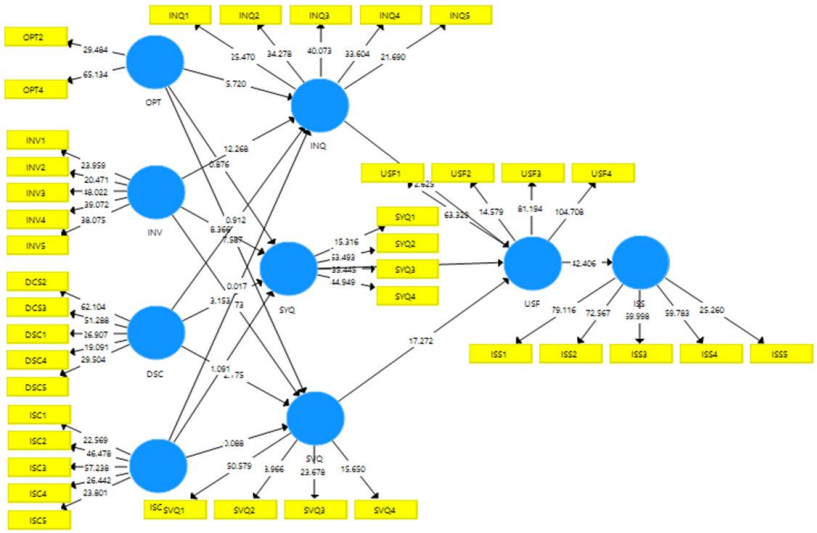

Figure 3. Structural Model Results

Table 6. Structural Model Analysis

Hypothesis		β	T-test	Analysis	
No	Path			β	T - test
H1	OPT -> INQ	0,292	5,720	Significant	Accept
H2	OPT -> SYQ	0,067	0,876	Unsignificant	Reject
H3	OPT -> SVQ	0,431	7,587	Significant	Accept
H4	INV -> INQ	0,542	12,26	Significant	Accept
H5	INV -> SYQ	0,508	8,366	Significant	Accept
H6	INV -> SVQ	0,018	0,273	Unsignificant	Reject
H7	DSC -> INQ	-0,08	0,912	Unsignificant	Reject
H8	DSC -> SYQ	-0,33	3,153	Unsignificant	Accept
H9	DSC -> SVQ	0,264	2,775	Significant	Accept
H10	ISC -> INQ	0,001	0,017	Unsignificant	Reject
H11	ISC -> SYQ	0,113	1,091	Significant	Reject
H12	ISC -> SVQ	0,007	0,088	Unsignificant	Reject
H13	INQ -> USF	0,217	2,625	Significant	Accept
H14	SYQ -> USF	-0,19	3,358	Unsignificant	Accept
H15	SVQ -> USF	0,754	17,27	Significant	Accept
H16	USF -> ISS	0,901	42,40	Significant	Accept

Source: (Sani et al., 2022)

β is tested with a threshold value above 0.1 to state that the path in question influences the model. The result is that 10 of the 30 paths show a statistically insignificant effect, as shown in Table 6.

The T-test was tested by a bootstrapping method using a two-tailed test with a significance level of 5% to test the research hypotheses. The hypothesis will be accepted if it has a t-test greater than 1.96 (Hair et al., 2012; Hair Jr et al., 2016; Subiyakto, Ahlan, Kartiwi, & Putra, 2016). Table 6 shows that only 10 of the 16 hypotheses were accepted.

There is no statistically significant effect of the ISC variable on INQ, SYQ and SVQ. It is indicated by the insignificance of the path between ISC to INQ and SVQ (ISC -> INQ and ISC -> SVQ). The two hypotheses are not accepted. The results of this analysis are inconsistent with several previous theories, including DeLone and McLean (2003), Petter, DeLone, and McLean (2008).

The researcher believes that this inconsistency is related to inaccuracy in using indicators and their operationalization to research instruments, as explained in the first paragraph. Similarly, even if the research model development and operationalization have been done as thoroughly as feasible, this may occur. Therefore, it is also recommended for further review and development related to using indicators from the ISC and their operationalization.

Another possibility is that this reflects the conditions of IT implementation projects in the research object's SMEs organizations. That ISC is not one of the factors influencing the project's success. On the other hand, INQ and SVQ are the main factors directly affecting the project's success. Furthermore, this can be related to the level of influence of INQ, SYQ and SVQ in the implementation of IT implementation projects, as shown by the significant path coefficient on other variables in the model, including also on USF (INQ -> USF, SYQ -> USF and, SVQ -> USF).

CONCLUSION

Procedurally, the analysis phase followed what was suggested by several previous related studies, including Hair et al. (2011) and Hair et al. (2012), specifically related to using the PLS-SEM method with SmartPLS software. In general, the implementation of the IT implementation project is indicated to have been successful based on the strategic plans made previously, as noted in the demographic information of the project profile. Furthermore, the analysis of the model structure has been carried out based on the results of model measurements that have good psychometrics and includes two types of analysis, starting from the analysis and T-test, the critical point from the results of the model structure analysis is related to technology readiness with variables OPT, INV, DSC and ISC and the success of IT implementation projects with INQ, SYQ, SVQ and USF variables. Interpretation of the results is also carried out by considering the limitations of statistical testing aspects, theoretical aspects based on support from several previous theories, and practical aspects related to the actual conditions of project implementation in the field. So based on the limitations of the research performance described, several suggestions can be underlined for the implementation of further research.

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