Analysis of Information Technology Readiness in Furniture Business in Indonesia

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Abstrak. Adopsi teknologi informasi (TI) dapat dinilai dari perspektif kesiapan pengguna. Penelitian ini mengkaji tingkat kesiapan Usaha Mikro Kecil Menengah (UMKM) di sektor furnitur dalam mengadopsi TI. Desain dan model penelitian dikembangkan dengan menggunakan Technology Acceptance Model (TAM) dan Technology Readiness Index (TRI). Pengambilan sampel yang digunakan dalam penelitian ini adalah *nonprobability procedure* dengan teknik *purposive sampling*. Pengumpulan data dilakukan dengan metode survei kuesioner dan dianalisis menggunakan metode Partial Least Square (PLS). Secara umum, hasil penelitian menunjukkan bahwa UKM sektor furnitur di Pulau Jawa sudah siap mengadopsi TI. Namun temuan penelitian juga menunjukkan bahwa persepsi ketidaknyamanan dan ketidakamanan merupakan isu utama yang berpotensi menghambat adopsi TI oleh UKM sektor furnitur. Implikasi bagi pemangku kepentingan dan penelitian empiris dibahas lebih lanjut.

Kata Kunci: indeks kesiapan teknologi; model penerimaan teknologi, UMKM, furnitur

Abstract. Adoption of information technology (IT) can be assessed from the perspective of user readiness. This study examines the level of readiness of the Micro, Small and Medium Enterprises (MSME) of furniture sector in adopting IT. The design and research model are developed using the Technology Acceptance Model (TAM) and the Technology Readiness Index (TRI). The sampling used in this study is a non-probability procedure with a purposive sampling technique. The data is collected using questionnaire survey method and analyzed using the Partial Least Square (PLS) method. In general, the research findings indicate that the furniture sector SMEs in Java are prepared to adopt IT. However, research findings also indicate that the perception of discomfort and insecurity is the major issue that potentially hinders the IT adoption by the furniture sector SMEs. The implications for stakeholders and empirical research are discussed further.

Keywords: technology readiness index; technology acceptance model; MSME; furniture

1. Introduction

Indonesia as a developing country, most of the economy is supported by Micro, Small and Medium Enterprises (MSMEs). The data collecting from the Central Bureau of Statistics (BPS) reports that 90%-95% of businesses in Indonesia are listed as small and medium-sized enterprises. This indicates that Indonesia's economic development has been driven and controlled by SMEs activities. MSMEs have also demonstrated the sustainability of their companies in the midst of a market crisis. It is because MSMEs have a large market in the country and do not rely on the financial services sector.

In the face of increasingly intense market rivalry, technology has become one of the methods to encourage the productivity of companies. This is certainly quickly simple to do by companies that have necessary resources, but for MSMEs the use of technology may not have been a priority in business development. Previous research states that information technology is one of the holistic models of Business Process Management Maturity (BPMM) as a diagnostic tool to enable identification of business process deficiencies in the company [1]. By integrating the right Information and Communication Technology (ICT) applications with business processes at the right time, ICT can help MSMEs increase competitive ability and develop the ability to innovate, to create and to share knowledge, which is very important to compete and survive in a knowledgeable society [2]. Despite the determinants of the maturity level of MSME business processes, MSMEs in Indonesia are very far from implementing IT [3]. The weakness of MSMEs in improving business capability is very complex, starting from the lack of capital, managerial skills, operating skills in organizing, and marketing [4].

In terms of technology use, ICT adaptation is not a priority since there is only 58.6% of MSMEs have adopted computer technology to support their business process activities [5]. The difficulty in applying industrial technology 4.0 is caused by the lack of workers, the beyond-reach industry that not in terms of products and production, and in capability to invest new technology [6].

The development of MSME in entering industry 4.0 requires a readiness of the actors or owners of MSME. Assessing the readiness to adopt new innovations is an important prerequisite for developing and following market developments. This shows that ICT plays an important role in the world of business and industry [7].

This study aims to examine the readiness of the MSME furniture sector in Indonesia in adopting IT. This research is important for several reasons. Firstly, the previous empirical studies are more concentrated in discussing implementation while the empirical research that examines the determinants of IT adoption at MSMEs is relatively limited [8]. In fact, a study of the determinants of IT adoption and readiness provides strategic information for the government in formulating MSME development policies. Second, the previous empirical studies tend to study in the context of large companies so that their findings cannot be generalized in the context of MSMEs, because the two research contexts have fundamental differences in company size, economies of scale, managerial models, types of IT needed, and IT governance systems models. The special feature of MSMEs is the centralized decision structure and the central role of the leadership which reinforces the notion that the characteristics of the leader play a major role in the decision process for adopting IT. Another characteristic of small businesses related to IT adoption is the low level of IT knowledge and technical skills possessed by leaders and employees, which later becomes an obstacle for MSMEs in adopting IT. The low readiness and ability to operate a computer also allows for the emergence of perceptions about the many difficulties that will be faced in adopting computer technology to run a business.

In the discussion about the acceptance of information systems/new technologies, the theory of acceptance model (TAM) introduced by Davis (1989) notes that the use of the system (system usage) is affected by the interest in the use of the system (behavioral intention). Interest in using a system is influenced by user perceptions (beliefs) which are further divided into two, namely perception of system usefulness (perceived of usefulness) and perceived ease of use. Individual characteristics become one of the center of attention in determining factors that influence a person's acceptance to new information/technology systems. One of them is the readiness of individuals to use technology in

general. This readiness is measured through an instrument, the Technology Readiness Index (TRI) [9]. TRI has four dimensions consisting of: optimism, innovation, discomfort, and insecurity.

Based on the description stated above, this study combining the concept of Technology Acceptance Model (TAM) and Technology Readiness Index (TRI) to determine the impact of Technology Readiness on the perceived usefulness of the system (perceived of usefulness) and perceived ease of use by individuals or MSME owners. Subsequently, the interest in using/adopting (behavioral intention) computer technology to support business processes in MSME furniture sector in Indonesia increases.

2. Literature

2.1. Information Technology Adoption Model
There are many theories used in Information Systems research. The author is only interested in theories about technology adoption. The most widely used theory is the Technology Acceptance Model (TAM) [10] [11] [12], Theory of Planned Behavior (TPB) [13] [14], Unified Theory of Acceptance and Use of Technology (UTAUT) [15], DOI [16], and the TOE framework [17]. The author will only develop DOI, and especially the TOE framework, because DOI and TOE are the only ones that exist at the company level. TAM, TPB and UTAUT model are at the individual level.

2.2. Technology Readiness Index (TRI)
There are differences in people's tendency to use technology. Rogers divided people into five groups that explained their character; from innovator to slow [16]. The technology readiness index (TRI) is a framework related to technology in general. The different characteristics between people and their beliefs about different aspects of technology are not the same. The relative strength of each trait indicates one's openness to technology. TRI thus reflects a set of beliefs about technology but is not an indicator of one's competence in using it.

TRI has four constructs: two constructs which are motivators, and the other two constructs are obstacles. The four components include:
• *Motivator:*
    Optimism - the general belief that technology and innovation have positive benefits
    Innovative - inherent tendency to want to experiment, learn and talk about technology
• *Inhibitors:*
    Discomfort - lack of control over technology
    Insecurity - the belief that technology can have a negative impact on users and society

2.3. Technology Acceptance Model (TAM)
Technology Acceptance Model (TAM) is a model that can be used to evaluate factors that affect the acceptance of a system. There are three variables that have an effect on the use of the device [10]:
  1) Perceived Usefulness: A level where someone believes that using the system can improve work performance
  2) Perceived Ease of Use: A level where someone believes that using the system does not need to bother
  3) Intention To Use: Behavioral tendency to use a technology
The three factors listed above can be used as variables in the research to decide how the user embraces an information system that is being designed or running.

3. Methods
This research is a comparative causal study that aims to explain the relationship between variables studied. This study discusses the influence of technology readiness on the perception of system usefulness (perceived of usefulness) and perception ease of use of the system (perceived ease of use) towards the adoption of computer technology by MSMEs in Indonesia.

This research is conducted using survey method. The population of this study are all MSMEs in the furniture sector registered at BPS (Central Statistics Agency) in 2012 with a total population of seven companies.

We use purposive sampling as the sampling technique. Purposive sampling technique is the technique of identifying the sample with any assumptions [18]. The criteria used to assess the sample of this analysis are MSMEs in the furniture sector registered at BPS.

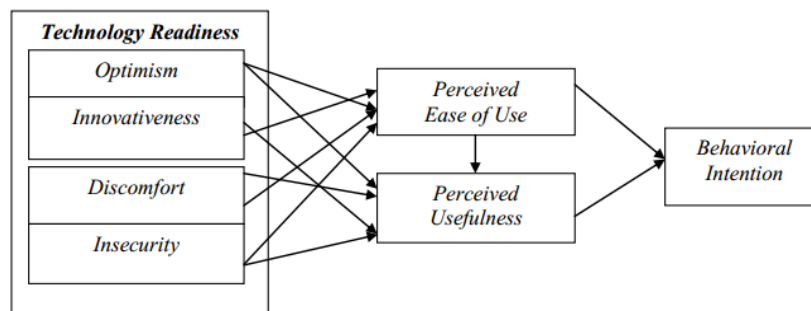To test the proposed hypothesis, the researcher used the following model:

Figure 1. Research Model of Technology Readiness

3.1 Research Instruments

For data collection by questionnaire, this study uses a nominal scale 1-7 with strongly disagree for value 1 and strongly agree for value 7. Respondents are free to determine the value of each question without solving/giving criteria that have been determined. The omission of these criteria aims to avoid the opinion bias given by respondents due to the tendency to give an answer with safe value. The instrument grids are presented in the following Table 1:

Table 1. Questionnaire

Variable	Indicator	Item	Source
Technology Readiness	Optimism	1*, 2, 3, 4, 5, 6, 7, 8*, 9*, 10	Walczuch et al (2007)
	Innovativeness	11, 12*, 13, 14, 15, 16, 17	
	Discomfort	18, 19*, 20*, 21*, 22*, 23*, 24*, 25*, 26*, 27*	
	Insecurity	28*, 29*, 30, 31*, 32, 33, 34, 35, 36	
Perceived of Usefullness		37, 38, 39, 40, 41, 42	Davis (1989)
Perceived Ease of Use		43, 44, 45, 46*, 47, 48	Davis (1989)
Behavioral of Intention		49, 50, 51	

*: invalid

4. Results

4.1 Validity

Pearson Correlation Product Moment Validity Test uses the principle of correlating or linking each item or problem score with the total score obtained from the respondent's answer to the questionnaire.

From the analysis results obtained correlation values between item scores with total scores. Then the value is compared with the r table. R table is sought at the 0.05 significance by 2-sided test and the amount of data (n) = 7, then the r table is 0.754 (see table r).

Based on the analysis results obtained correlation values for items 1, 8, 9, 12,20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, and 46 with values less than 0.754. Because the correlation coefficients on these items are less than 0.754, it can be concluded that the items do not correlate significantly with the total score (declared invalid) so they must be excluded or corrected. While in other items the value is more than 0.754 and it can be concluded that the instrument is valid.

4.2 Reliability

The reliability test is used to assess the internal accuracy of the measurement instrument. Reliability test shows the consistency and accuracy of a tool in measurement [19].
The following are the results of the analysis conducted in the steps of Reliability Test in SPSS:

1. *Case Processing Summary*

Case Processing Summary

		N	%
Cases	Valid	7	100.0
	Excluded[a]	0	.0
	Total	7	100.0

a. Listwise deletion based on all variables in the procedure.

Figure 2. Case Processing Summary

The overview case analysis table shows the total cases examined and the number of relevant case values.

2. *Reliability Statistics*

Reliability Statistics

Cronbach's Alpha	N of Items
.549	34

Figure 3. Reliability Statistics

The reliability statistics table shows the results of the analysis of the reliability test with Cronbach's Alpha = 0.549 of 51 variable items. The reliability value of 0.549 is a moderate value. So this questionnaire is said to be consistent (reliable).

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
OPT2	173.00	120.667	.704	.510
OPT3	173.14	122.476	.524	.518
OPT4	173.29	121.238	.319	.522
OPT5	173.14	128.143	.074	.549
OPT6	172.71	125.238	.395	.529
OPT7	172.86	127.476	.307	.536
OPT10	173.43	118.286	.430	.509
INN1	175.00	103.000	.539	.463
INN3	175.29	113.238	.427	.498
INN4	175.00	110.000	.502	.484
INN5	174.43	118.952	.190	.535
INN6	174.00	121.000	.149	.542
INN7	174.57	101.619	.660	.447
DIS1	173.57	139.286	-.306	.587
INS3	175.57	145.952	-.388	.622
INS5	175.43	152.619	-.538	.638
INS6	175.00	147.333	-.434	.623
INS7	175.00	147.333	-.434	.623
INS8	175.57	142.952	-.358	.606
INS9	175.71	144.905	-.394	.613
USE1	172.14	130.810	.068	.548
USE2	172.14	130.810	.068	.548
USE3	172.14	130.810	.068	.548
USE4	172.14	130.810	.068	.548
USE5	172.29	135.238	-.299	.564
USE6	172.14	130.810	.068	.548
EASE1	172.71	123.238	.528	.520
EASE2	172.71	123.238	.528	.520
EASE3	172.71	123.238	.528	.520
EASE5	173.00	110.667	.683	.475
EASE6	172.86	109.143	.699	.469
BI1	173.57	114.286	.436	.499
BI2	173.14	118.143	.617	.502
BI3	172.86	116.476	.562	.498

Figure 4. Item Total Statistics

Figure 4 shows the change of Cronbach's Alpha value if each item is removed from the questionnaire. This can be used if it is felt that Cronbach's Alpha value is still insufficient for the relevant research.

5. Discussion

In testing the effect of optimism on the perception of technology researchers proposed two hypotheses, namely: H1a: Optimism towards technology has a positive effect on perceived ease of use of technology, and H1b: Optimism on technology has a positive effect on the perception of the benefits of using technology. Both hypotheses are supported by research results. This support shows that individual optimism can encourage someone to adopt a technology. For SMEs, this also has an impact on the company's decision to adopt computer technology. Attitude optimistic that the use of computers in their business activities will be able to provide operational benefits and convenience as well as contribute to operating profits will encourage the implementation of computer technology by MSME actors / owners.

The results of this hypothesis test are in line with research conducted by Walczuch [20] who also has the same conclusions as this study. They also stated that optimism has a fairly strong influence on perception utilization and perception of ease of use of technology.

Effect of Innovativeness on perceptions of technology tested through H2a: Innovativeness on technology has a positive effect on perceptions of ease of use of technology, and H2b: Innovativeness on technology has positive effect on the perception of the benefits of using technology. Hypothesis 2a (H2a) is supported by the test results while hypothesis 2b (H2b) is not supported. Support for H2a is in line with the research of Yi et al (2006) which shows that high levels of individual innovation support the rate of adoption of a technology. This research shows the level of personal innovation is a strong factor in the perception of ease of technology.

H2b stating that a positive relationship between innovativeness and perceived benefits is not supported by the results of tests that have been done. The rejection of this hypothesis can be caused by the majority of respondents engaged in handicraft businesses that have low technological content in running their main business processes. The low content of technology is evidenced by the low use of computer technology (52%) compared to the number of competitors who also use computer technology (50%). Thus, the respondents' technological content to run a business does not play a significant role that impacts the perception of the benefits of technology computer to run a business.

Testing the effect of Discomfort on perception of technology is done by proposing two hypotheses, namely: H3a: Discomfort on technology negatively affects the perception of ease of use of technology and H3b: Discomfort on technology does not affect the perception of the benefits of using technology. The test results show that hypothesis 3a (H3a) is not supported while hypothesis 3b (H3b) is supported. Support to the hypothesis is in accordance with the results of the study of Walczuch [20] which shows that people who are less comfortable will have a tendency not to perceive the benefits of using technology.

Test results that show the rejection of hypothesis 3a (H3a) show a negative relationship, in line with the hypothesis, although it cannot be concluded to have a negative effect because the effect is not significant. This shows that although respondents feel uncomfortable with their computers they still tend to perceive that using computer technology is easy. From the descriptive analysis data it can be seen that the low level of government support (19%) does not affect the use of computer technology in respondents (50% of respondents use computers). In addition, the rejection of H3a can also be caused by a lack of specific applications being assessed so that leads to distortions to occur in respondents' judgments regarding the ease of use of computer technology. The variety of applications that are mastered and used by respondents can affect perceptions of ease. In this study, researchers do not control the applications used by respondents so that respondents may feel uncomfortable using the application X but find it easy to use application Y. These differences can affect the final results of respondents' perceptions.

In principle, what is proposed in testing the effect of insecurity on perception of technology is its negative effect on the perception of the ease and benefits of technology. The hypothesis proposed is H4a: Insecurity of technology negatively influences the perception of ease of use of technology, and H4b: Insecurity of technology negatively influences the perception of the benefits of using technology. Both hypotheses are submitted unsuccessfully supported. Test results on H4a show insignificant negative results, while H4b test results show contrasting results from the proposed

hypothesis which shows positive and significant results. These results indicate that the phenomenon is in contrast to previous studies showing that insecurity variables have a negative influence on perceptions of technology [20] [21].

The differences in results occured because the previous studies' samples of technology adoption did not involve strong competition. Walczuch [20] used a sample of employees in the use of applications (technology) in a company that had no effect on one's achievements, while Ling and Moi [21] used students to find out readiness in adopting e-learning. The two conditions do not have an element of competition which requires the use of technology to win the competition. In contrast to previous research, this study uses a sample of business units aiming to make a profit. The achievement of profit is the main goal of the respondents of this study. Thus, even if an innovation (including technology) is risky (insecure), it will still be adopted as long as the innovation is considered beneficial.

The effect of perceived ease of use of technology on perceived usefulness was tested using the H5 hypothesis, namely perceived ease of use of technology had a positive effect on perceived usefulness of technology. The test results shows a positive and significant effect between the two variables. This reinforces previous research showing similar results. The ease and benefits of using technology have been widely validated by research after that. This study helped strengthen the evidence of the relationship between the constructs of the two variables [11].

Perception of ease and benefit of a technology has been proven by many previous researchers. The logic of the relationship between ease and benefit of interest in using IT can be said to be a common construct in various concepts of scientific disciplines. To examine the effect of perception on interest in using technology, this study proposes two hypotheses, namely: H6a: Perceived ease of use of technology has positive effect on the interest in using technology, and H6b: Perception of the benefits of using technology has a positive effect on interest in using technology. The test results shows that all the constructs tested show a positive and significant relationship. This result is in line with research conducted by [11] [22].

6. Conclusions
From the results of the test and discussion the following conclusions can be drawn:
In general, the research findings indicate that the furniture sector SMEs in Java are prepared to adopt IT. However, research findings also indicate that the perception of discomfort and insecurity is the major issue that potentially hinders the IT adoption by the furniture sector SMEs. The mentioned computer technology does not refer to a particular application, so that it strengthens the weaknesses of the questionnaire method that is self-report and can distort respondents' perceptions of an issue. This research does not pay attention/distinguish the size and complexity of the respondent's business.

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