

The readiness to adopt information technology on small and medium enterprises (smes) of shell and pearl handicraft in maluku province

Grace Persulesy¹, Micrets Agustina Silaya²

^{1,2}Faculty of Economy, Indonesia Christian University of Maluku Indonesia

Ot Pattimaipauw street , Talake Nusaniwe, Maluku. *Phone Number 0911-348521*

Email: persulesygrace@gmail.com¹,

Received: 11.03.2020

Revised: 12.04.2020

Accepted: 28.05.2020

Abstract:

This research aims to examine the readiness of the SMEs of shell and pearl handicraft in Maluku Province to adopt information technology (IT) using the Technology Readiness Index (TRI) model. Four (4) constructs of TRI are optimism, innovativeness, discomfort and insecurity. This research is conducted using a questionnaire distributed to 43 SMEs. By using the Partial Least Square (PLS) approach, the result of the research discovers that Optimism on technology has a positive influence towards the readiness to adopt IT, Innovativeness on technology has a positive influence towards the readiness to adopt IT, Discomfort on technology does not have negative influence towards the readiness to adopt IT and the negative influence of Insecurity on technology has a positive influence towards the readiness to adopt IT.

Keywords: Technology Readiness Index/TRI, Optimism, Innovativeness, Discomfort, Insecurity

1. Research Background

Small and medium enterprises (SMEs) are the largest economic group that absorbs 99.5% of the workforce in Indonesia (Ririh, Anggrahini, & Amalia, 2012). SMEs focus on local resources, so that the products manufactured by these SMEs have their own characteristics and have a great opportunity to be exported. Indonesia is a maritime country that has abundant marine resources, including shells in various types, colors and shapes. This potential must be strengthened with accurate design, innovation, and strategy, so that SMEs that involved in this domain can continue to survive in business competition. Therefore, the government continues to strive to develop SMEs in Indonesia, especially SMEs that have shell-made handicraft products¹. Maluku is one of the provinces in Indonesia, which its prominent products are shell and pearl handicrafts. Data from the Disperindag (Office of Industry and Trade Affairs) of Maluku Province (2015) displays that there are 12 SMEs involved in this domain, with a total manpower of 82 people.

SMEs often encounter the classic problem of limitations in various matters such as capital, managerial ability, skills, market access, and supporting technology, especially information technology (IT), so that it has difficulty in developing ((Sheth & Sharma, 2005), (Thong, 1999)), whereas SMEs, with certain characteristics, can use IT to gain a wider market segment (Bossone and Lee, 2004) in (Flood et al., n.d.). IT is one of the solutions for SMEs to improve efficiency and reduce production costs (Darbanhosseiniamirkhiz & Wan Ismail, 2012). The use of IT on SMEs can also be useful to accelerate business transformation, improve accuracy and efficiency of information, and expand marketing networks ((Utomo, S. Joko; Santoso, P.B.; Yuniarti, 2006), (Turban, McLean, & Wetherbe, 2000)). However, IT adoption by SMEs in Indonesia is still very low. It is revealed through the results of AMI Patners' research, which discover that only 20% of SMEs in Indonesia already have computers to support their business activities (Wahid & Iswari, 2007). IT adoption in SMEs is not a simple matter to be implemented. SMEs often experience problems and failures in IT adoption in their businesses, whereas investment in IT is very expensive ((Levy & Powell, 2005), (Sarosa & Zowghi, 2003)).

This research aims to examine the readiness of SMEs of shell and pearl handicraft in Maluku Province to adopt IT. This research is conducted based on two reasons. First, (Thong, 1999) found that previous researches

in SMEs merely focus on IT implementation while research that examines the determinants of IT adoption on SMEs is still limited in number. Whereas research on the determinants of adoption and readiness in adopting IT can provide strategic information for the government to formulate policies in order to develop the potential and competitiveness of SMEs. Second, previous researches merely focus on examining IT adoption in large companies, thus the results of the research cannot be applied in the context of SMEs. Differences between the two businesses in company's sizes, business processes, managerial models, types of IT required, and IT governance system models, establishes the necessity for researches on the determinants of the readiness of SMEs to adopt IT, especially of SMEs of shell and pearl handicraft in the Province Maluku.

This research focuses on the study of IT adoption readiness on SMEs of shell and pearl handicraft in Maluku Province using the Technology Readiness Index (TRI) model (A., 2000). The TRI model is selected to be applied in this research because this model can measure individual readiness when adopting IT in an organizational context more accurately (Liljander, Gillberg, Gummerus, & van Riel, 2006). This research is expected to be able to predict the readiness of shell and pearl handicraft SMEs in Maluku to adopt IT.

2.Literary Review

Technology Readiness / TR

Technology Readiness (TR) is a term used to describe the way people respond to changes in their lives because of the use of technology. (A., 2000) defines TR as a person's tendency to accept and use new technology to accomplish goals in domestic life and at work. The construct of TR is a mind statement as a whole of the mental gestalt of supporters and inhibitors that collectively determine the tendency to use new technology. (A., 2000) proposes a technology readiness index (TRI) by identifying four dimensions of trust in technology that have an impact on each person's TR level. The four constructs are optimism, innovativeness, discomfort, and insecurity. Optimism and innovation are supporting factors that can increase readiness for the use of technology, while discomfort and insecurity are inhibitors that suppress the readiness to use new technologies (A., 2000).

3.Method of Research

The purpose of this research is to measure the readiness of shell and pearl handicraft SMEs in Maluku Province in adopting new technologies to be applied in their businesses. This research is an explanatory research, a research that uses a statistical approach to analyze data obtained from the results of a questionnaire survey, based on concepts and theories that can explain the phenomenon of the readiness of the shell and pearl handicraft SMEs in Maluku Province to adopt IT. This research uses a questionnaire corresponding to technology readiness survey (TR) developed by (A., 2000). The questionnaire consisted of two sections. Section 1, contains 5 questions about respondent demographics namely gender, age, marital status, education, and income per month. Section 2, contains 66 items of TRI scale representing 4 TR constructs namely optimism, innovativeness, discomfort, and insecurity (A., 2000). For question items about TRI, respondents give an assessment using a five-point Likert scale, with "strongly disagree" (1), and "strongly agree" (5) as anchors. The survey is carefully prepared, firmly reviewed, and thoroughly revised based on its feedback by the main researcher.

The data of this research are analyzed using the Partial Least Square (PLS) approach by incorporating all indicators with construct into one test model. Reliability analysis is applied to test the reliability coefficient (Cronbach Alpha) of the instrument. The statistical analysis applied in this research is descriptive and frequency analysis, bivariate correlation, and cross tabulation.

The TRI items are measured based on collective calculation positive statements and a reverse code negative statements. The average score is calculated from the total score of each construct that indicates the willingness of respondents to accept new technology (Parasuraman, 2000). The resulting TRI score, ranging from 0 to 5, indicates whether respondents strongly disagree (1), disagree (2), neutral (3), agree (4), or strongly agree (5) on readiness for the adoption of certain technologies. The overall TRI is calculated by the average score of the four TRI components, where discomfort and insecurity are coded in reverse.

4.Result and Discussion

Respondents' Profile

Respondents of this research were included in the small business group category because 42 respondents (97.67%) have an average sales profit of less than IDR 100 million and only 1 respondent (2.33%) have a profit of IDR 100 million – IDR 500 million. This is in accordance with the classification of 2008 Act No. 20 concerning micro, small and medium enterprises. According to that Act, small businesses are entities with the

criteria of a net worth of IDR 50 million – IDR 500 million excluding land and buildings, and have annual sales results of IDR 300 million – IDR 2.5 billion.

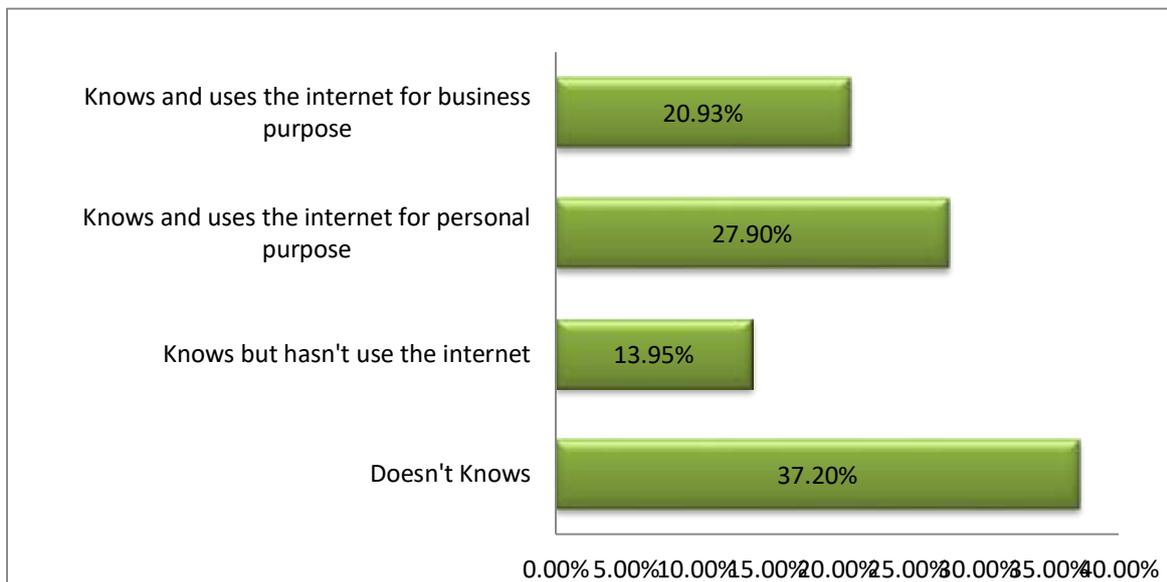
In terms of age, most of the respondents in this research are between 41 – 50 years old, which are 19 people (44.2%). Then, respectively followed by, between 30 – 40 years old, which are 16 people (37.2%), less than 30 years old, which are 5 people (11.6%), and more than 50 years old, which are 3 people (6.97%). This result displays that the respondents are legal workers according to the Manpower Act because they are at the working age, which is between 15 – 64 years old.

Circumstance of IT Application on SMEs of Shell and Pearl Handicrafts in Maluku

This research describes the circumstance of the application of information technology (IT) in SMEs of Shell and Pearl Handicrafts in Maluku. This research uses 4 (four) indicators to observe the IT application, namely, the knowledge on IT, the application of internet technology to manage business and the obstacles encountered in marketing products by the internet.

In this research, a survey is conducted to learn 2 points about the SMEs owners: the knowledge about internet technology and the knowledge about the benefits of internet technology in supporting the management of business activities. The result of the survey reveals that there are 16 PKM (37.2%) who does not have knowledge about the internet technology whatsoever, 6 PKM (13.95%) who already have knowledge about the internet technology but never applies it, both for personal and business purposes, and 12 PKM (27.90%) who have knowledge about the internet technology, but only applies it for personal purposes. While the number of PKM who have already applied the internet technology for business purposes remains relatively small, only 9 PKM (20.93%).

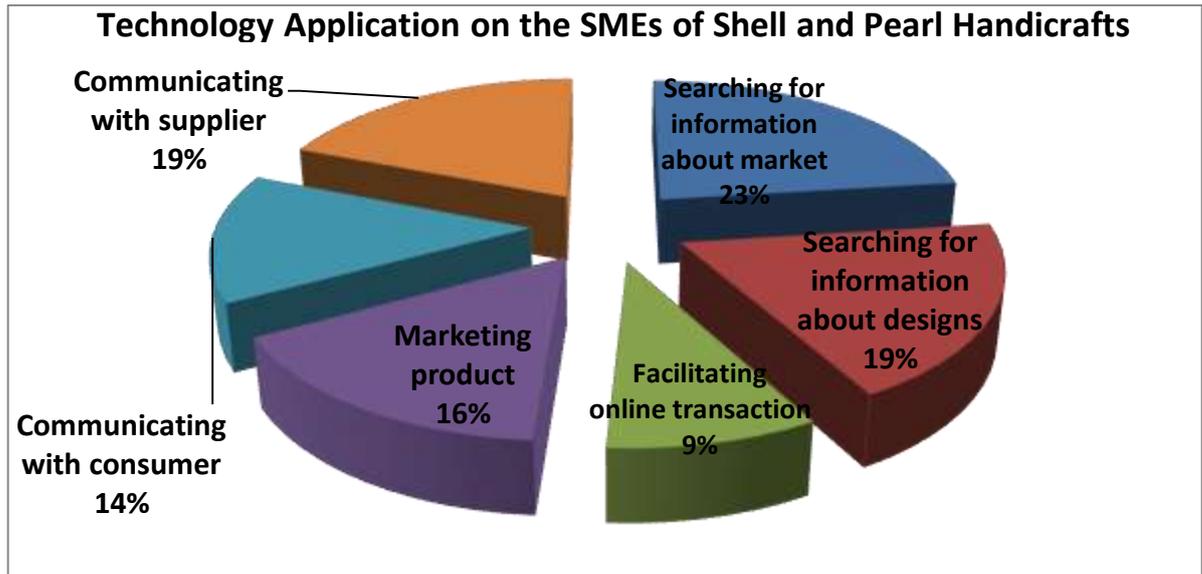
Figure 1. The Knowledge of Shell and Pearl Handicrafts SMEs Owners about Internet



Source: Processed primary data

As for the level of internet technology application on business activities by the respondents, in this case SMEs of shell and pearl handicraft in Ambon that have applied internet technology, it is presented in the following Figure 2. From this graphic, it can be seen that the highest level of internet technology application on those SMEs is to find information about the market and information about product design.

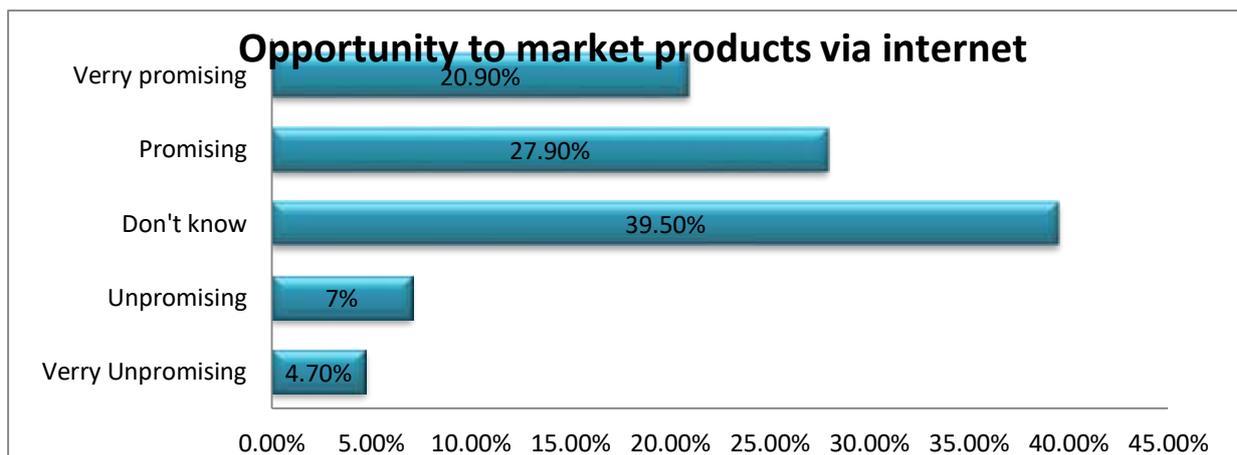
Figure 2. Internet Technology Application on the SMEs of Shell and Pearl Handicrafts in Maluku



Source: Processed primary data

In this survey, PKM are also given questions about the opportunity to market their products via the internet, where 21 PKM answer 'don't know', 3 PKM answer 'unpromising', and 2 PKM answers 'very unpromising'. It is because these PKM are yet to have knowledge about online business transactions. The survey result discovers that most of PKM are concerned about transaction security issues, both when selling products and when buying raw materials. They are anxious of being cheated if they do online transactions, as is frequently reported in the printed and electronic mass media. Nevertheless, there are 17 PKM (48.83%) who think that using the internet to market the products is one of the promising methods for their businesses.

Figure 3. Opportunity to Market the Products via Internet on SMEs of Shell and Pearl Handicrafts in Maluku



Source: Processed primary data

This research identifies at least 3 things that become the inhibiting factors for the SMEs of shell and pearl handicrafts in Ambon to adopt IT. *First*, human resources. The obstacles that the SMEs of shell and pearl handicrafts in doing business electronically or computerized are caused by the lack of manpower with knowledge about computers. It is confirmed by the profile of respondents who only have 2-3 employees who have computer knowledge. *Second*, technological resources. In the business world, information technology has an actual impact. Business transaction data is recorded and processed online. At almost the same time (real-time) information about the data can be directly accessed, as is customary when bank customers make transactions using ATM (automated teller machine). *Third*, limited business capital. Implementation of information technology requires huge amount funds, while SMEs have small and limited financial capabilities.

Validity and Reliability Test

For the validity and reliability of the instruments, initial testing is conducted on the relationship between constructs and indicators (outer model). Discriminant validity in PLS analysis is fulfilled, if the correlation of indicators with a construct has a higher score than the correlation of these indicators with other constructs (cross loading).

The instrument test shows that all loading factors have a score of more than 0.6. The lowest minimum AVE score of all variables is > 0.5, while the highest score is 0.8. In addition, it can be observed that there are no variables with the communality score of < 0.05. This test result indicates that all instruments have fulfilled the validity requirements.

The reliability test result indicates that almost all variables have Cronbach’s alpha and composite reliability scores of > 0.7. There is only one variable that has the Cronbachs alpha of < 0.7; however, the score of composite reliability is > 0.7, so that the particular instrument have fulfill the reliability requirements

Table 1. The Results of Validity and Reliability Test

	AVE	Composite Reliability	CronbachsAlpha	Communality
Discomfort	0,515176	0,759692	0,563841	0,515176
Innovativeness	0,547795	0,878404	0,8	0,547795
Insecurity	0,565372	0,837987	0,745691	0,565372
Optimism	0,551993	0,916705	0,897551	0,551993
PU	0,805271	0,961207	0,95132	0,805271

Source: Processed primary data

Table 2. Cross Loading

	Behavior Intention	Discomfort	Innovativeness	Insecurity	Optimism	PEoU	PU
BoU1	0,924653	0,307325	0,43636	0,382555	0,54477	0,49853	0,683788
BoU2	0,923611	0,228131	0,453268	0,318866	0,559201	0,500855	0,639634
BoU3	0,834888	0,230994	0,406608	0,338905	0,476582	0,4129	0,5724
Dis6	0,233158	0,769875	0,330491	0,112929	0,321329	0,249061	0,243863
Dis7	0,21957	0,751604	0,156204	0,417937	0,266843	0,112468	0,251473
Dis8	0,144905	0,622827	0,025934	0,407189	0,187546	0,067621	0,143
Inn1	0,355657	0,201569	0,692232	0,079214	0,476555	0,483935	0,394831
Inn3	0,277112	0,178829	0,671603	-0,04715	0,347384	0,422524	0,279903
Inn4	0,21495	0,12023	0,678332	0,055734	0,341753	0,410843	0,281382
Inn5	0,458239	0,206795	0,792028	0,17327	0,515351	0,557648	0,550468
Inn6	0,437412	0,333156	0,785881	0,217765	0,581647	0,533814	0,568642
Inn7	0,331114	0,176456	0,807145	0,076356	0,471003	0,530104	0,391532
Ins5	0,325269	0,259016	0,157867	0,740519	0,204868	0,14134	0,234858
Ins6	0,304416	0,271587	0,150286	0,775123	0,248531	0,100784	0,259958
Ins7	0,323189	0,358924	0,088595	0,820841	0,254283	0,113415	0,301794
Ins8	0,185739	0,23683	0,007149	0,662212	0,150224	0,024703	0,162444
Opt1	0,344543	0,306354	0,303501	0,251726	0,612496	0,28091	0,384978
Opt2	0,388859	0,293133	0,381821	0,213507	0,695195	0,351113	0,476202
Opt3	0,321872	0,24225	0,407186	0,163682	0,669587	0,352041	0,409621
Opt4	0,472666	0,268064	0,500506	0,233257	0,784358	0,395691	0,527839
Opt5	0,49366	0,248869	0,480729	0,236928	0,786501	0,476245	0,552566

Opt6	0,5464	0,29402	0,514901	0,292178	0,829527	0,443061	0,624512
Opt7	0,442498	0,346705	0,516522	0,159594	0,740448	0,410412	0,517557
Opt8	0,436378	0,224452	0,508533	0,215472	0,768713	0,435696	0,504974
Opt9	0,450358	0,303531	0,545478	0,195132	0,774624	0,472781	0,597212
PU1	0,589242	0,270001	0,470679	0,293786	0,596436	0,537672	0,862406
PU2	0,594245	0,269004	0,53104	0,256242	0,628099	0,588283	0,908971
PU3	0,609754	0,243683	0,53866	0,248959	0,603357	0,612435	0,911478
PU4	0,682249	0,277071	0,538495	0,296177	0,618065	0,614485	0,936422
PU5	0,668189	0,28448	0,515906	0,342227	0,661556	0,592698	0,919473
PU6	0,659185	0,31256	0,513083	0,327089	0,634396	0,565768	0,841751
PoU1	0,409088	0,208487	0,616397	0,102555	0,474416	0,893405	0,541467
PoU2	0,497548	0,206292	0,62733	0,15551	0,514233	0,909038	0,604927
PoU3	0,517349	0,225198	0,611365	0,161228	0,548145	0,908803	0,657757
PoU5	0,412451	0,142302	0,556681	0,031609	0,413374	0,844078	0,481176
PoU6	0,490446	0,203261	0,549676	0,12476	0,464324	0,874638	0,58989

Source: Processed primary data

TRI Model Test of Technology Reliability Level

The test is conducted using the Partial Least Square (PLS) approach by means of incorporating all indicators with constructs into one test model.

Table 3. PLS Test Results

	Original Sample(O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics ((O/STERR))
Discomfort->PU	-0,002487	-0,003646	0,030387	0,030387	0,08183
Innovativeness->PU	0,537271	0,536511	0,050271	0,050271	10,687498
Insecurity->PU	0,149875	0,152218	0,035696	0,035696	4,198641
Optimism->PU	0,422144	0,41909	0,047465	0,042963	9,825653

Source: Processed primary data

The test result displays several things. First: Optimism. PKM' optimism attitude, that the application of computers in their business activities will be able to provide operational benefits and easiness, as well as to contribute to business profits, is the supporting factor in encouraging the implementation of computer technology. Second: Innovativeness. The level of PKM personal innovation is a strong factor in providing perception about the easiness a technology can create. (Tjoa, Kastanya, Latumahina, & Aponno, n.d.). Third: Discomfort towards technology negatively influences the perception about the accessibility of technology and Discomfort of technology does not influence the perception about the benefits of applying technology. It shows that although respondents feel uncomfortable with their computers they still tend to perceive that using computer technology is a simple matter. Fourth: Insecurity. Perception of the use of technology has positive influence towards the perception of the benefits in applying technology. The test result displays positive and significant influences between the two variables.

5. Conclusion

Based on the test results and discussion the following conclusions can be drawn:

- 1) *Optimism* on technology has positive influence towards the perception on ease of use of technology.

- 2) *Innovativeness* on technology has positive influence towards the perception on ease of use of technology.
- 3) *Discomfort* does not have negative influence towards the perception on ease of use of technology.
- 4) Negative influence of *Insecurity* on technology has positive influence towards the perception on ease of use of technology.

6. Bibliography

1. A., P. (2000). Technology Readiness Index (TRI): A Multipleitem Scale To Measure Readiness To Embrace New Technologies. *Journal Of Service Research*, 2:307(May).
2. Darbanhosseiniamirkhiz, M., & Wan Ismail, W. K. (2012). Advanced manufacturing technology adoption in SMEs: An integrative model. *Journal of Technology Management and Innovation*, 7(4), 112–120. <https://doi.org/10.4067/S0718-27242012000400009>
3. Flood, R., Culhane, S. M., Oliver, R., Detragiache, E., Ghosh, A. R., Milesi-ferretti, G. M., & Savastano, M. A. (n.d.). *IMFstaffpapers*.
4. Levy, M., & Powell, P. (2005). Strategies for Growth in SMEs. In *Strategies for Growth in SMEs*. <https://doi.org/10.1016/B978-0-7506-6351-9.X5000-1>
5. Liljander, V., Gillberg, F., Gummerus, J., & van Riel, A. (2006). Technology readiness and the evaluation and adoption of self-service technologies. *Journal of Retailing and Consumer Services*, 13(3), 177–191. <https://doi.org/10.1016/j.jretconser.2005.08.004>
6. Ririh, K. R., Anggrahini, D., & Amalia, A. (2012). Strategi Kebijakan Pengembangan Dan Pembinaan Ikm Konveksi Sebagai Salah Satu Industri Kecil Menengah Di Indonesia. *J@Ti Undip : Jurnal Teknik Industri*, 6(3). <https://doi.org/10.12777/jati.6.3.179-188>
7. Sarosa, S., & Zowghi, D. (2003). *Strategy for Adopting Information technology for SMEs: Experience in Adopting Email within an Indonesian Furniture Company*.
8. Sheth, J. N., & Sharma, A. (2005). International e-marketing: Opportunities and issues. *International Marketing Review*, 22(6), 611–622. <https://doi.org/10.1108/02651330510630249>
9. Thong, J. Y. L. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4), 187–214. <https://doi.org/10.1080/07421222.1999.11518227>
10. Tjoa, M., Kastanya, A., Latumahina, F., & Aponno, H. (n.d.). *Certainty in the Management of Customary Community Forest Land in Western Seram District, Maluku*.
11. Turban, E., McLean, E., & Wetherbe, J. (2000). Information Technology for Management: Transforming Organizations in the Digital Economy. *Information Technology*, 2(4), 192–221. <https://doi.org/10.1108/09593840010377644>
12. Utomo, S. Joko; Santoso, P.B.; Yuniarti, R. (2006). Perancangan Sistem Pendukung Keputusan Pemilihan Karyawan Terbaik Berbasis 360 Degree Feedback Dan Analytical Hierarchy Process Design of Decision Support System Selection of the Best Employees Based 360 Degree Feedback and Analytical. *Rekayasa Dan Manajemen Sistem Industri*, 3(1), 110–120.
13. Wahid, F., & Iswari, L. (2007). Adopsi Teknologi Informasi Oleh Usaha Kecil Dan Menengah Di Indonesia. *Seminar Nasional Aplikasi Teknologi Informasi, 2007(Snati)*, 75–79.