The Role of Information Technology Capabilities in Improving Cost-Effectiveness and SME's Performance

Elvin Bastian[1,*], Munawar Muchlish[1] and Imam Ghozali[2]

[1]*Assistant Professor of Faculty Economics and Business, Universitas Sultan Ageng Tirtaysasa , Indonesia.*

[1]*Senior Lecturer of Faculty Economics and Business, Un iversitas Sultan Ageng Tirtaysasa, Indonesia.*

[2]*Professor of Fakultas Ekonomika and Bisnis, Universitas Diponegoro, Indonesia.*

Abstract: The purpose of this study is to empirically examine and analyze the role of information technology capabilities in increasing the cost-effectiveness and business performance of SMEs. This study uses a sample of managers or managers from Palm Sugar SMEs in Lebak, Banten Province. The sampling method in the study used purposive sampling. This study uses a path analysis tool with the WarpPLS version 5.0 program to test hypotheses. The results showed that the role of information technology capabilities had a positive effect on increasing cost-effectiveness and the ability of information technology could also improve SME's performance.

Keywords: Information Capabilities Technology, Cost Effectiveness, SME's Performance, and Warp PLS.

1. INTRODUCTION

Palm sugar has been an important source of livelihood for farmers and is one of the core potentials of the Lebak Regency. Palm Sugar Products are the superior products of the Lebak District. Lebak Regency is known as one of the biggest palm sugarproducing regions in Indonesia. The palm sugar industry in this district absorbs 5,406 workers through 2,982 micro and small business units, not counting labor in its distribution channel. The annual production capacity reaches 2,249.4 tons spread over 44 production centers. Problems that are often faced by SMEs, in addition to marketing difficulties, are also because the products they make are less competitive. In addition, the competitiveness of their products is indeed low, and the selling price is not competitive.

The presence of Information Technology (IT) is changing the way in businesses by providing new opportunities and challenges that are different from conventional methods. IT is one of the main pillars of the development of human civilization today that must be able to provide added value to the wider community (Saleh and Hadiyat, 2016). The issue that then arises is the digital divide (IT) gap, especially in remote areas, which is still very large. Therefore, it becomes important and urgent to open isolation access to information of people in remote areas; provide a public information service center or information access network to the countryside; provide information needed by the community to improve knowledge, economy, and standard of living; facilitate community social groups so they can develop creativity and showcase their products; as well as providing a place for tenants to turn creative ideas into innovative IT products to have competitiveness, excellence, and value.

With information technology, a company's activities can be carried out effectively and efficiently in costs because with faster operational activities, greater profits will be obtained by the company. Chriswan and Mahmudin (2008) stated that information technology offers many opportunities to reduce costs, increase efficiency, increase effectiveness and revenues, and can improve cost control. Sophisticated technology and information can help companies to monitor the activities carried out by their employees, so the company can obtain information more quickly and accurately use in decision making. If an error or deviation occurs, the company can immediately take corrective actions so that the effectiveness in the use of operational costs can be identified quickly so that the company's goals can be achieved (Salim Ridwan, 2014).

The relationship between information technology and performance is of interest to academics and practitioners. Several studies conducted by previous researchers found a significant relationship between information technology and performance. Kelley (1994), Siegel, and Griliches (1992) state that some of the results of the study found a positive influence of information technology on company performance at the industry level

Implementation of Information Technology can help reduce costs and can convey detailed information about products and special prices provided to consumers online and also facilitate the transaction process without having to come to the store directly and can get maximum results.

One function of the utilization of Information Technology is material efficiency (cost) and nonmaterial (energy and time).

*Address correspondence to this author at the Assistant Professor of Faculty Economics and Business, Universitas Sultan Ageng Tirtaysasa, Indonesia; E-mail: elvinbas69@untirta.ac.id

In terms of costs, companies can reduce costs by utilizing the telephone and internet as a medium of offer because it is cheaper than traditional. On the other hand, cost efficiency can occur due to a reduction in manpower in certain positions and primarily to improve performance.

2. THEORITICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

2.1. Information Technology Capability and Cost Effectiveness

Chris Ewan and Mahmudin (2008) stated that information technology offers many opportunities to reduce costs, increase efficiency, increase effectiveness and revenues, and can improve cost control. Sophisticated technology and information can help companies to monitor the activities carried out by their employees, so the company can obtain information more quickly and accurately used it in decision making. If a mistake or deviation occurs, the company can immediately take corrective actions so that the effectiveness in the use of operational costs can be identified quickly so that the company's goals can be achieved. Previous research that supports this research is a study conducted by Salim Ridwan (2014) and Ilker Calayoglu & Murat Azaltun (2013), which suggests that information technology has a significant effect on the cost-effectiveness of an organization. Therefore, the following hypotheses are proposed:

Hypothesis 1: There is a positive relationship between Information Technology Capabilities and cost-effectiveness.

3.2. Information Technology Capability and SME's Performance

Diewert and Smith (1994), Hitt and Brynjoltsson (1995), Dewan and Min (1997), Devaraj and Kohli (2003) indicate that there is a positive relationship between technology and company performance.

Devaraj and Kohli (2003) state that some studies do not find a significant relationship between information technology and performance. Baily (1986), Roach (1987), Morrison and Berndt (1991), Devaraj and Kohli (2003) found a negative relationship between information technology-relatedness variables that are associated with company performance. In addition, Berndt and Morrison (1995) and Kohli (1999) find that there is no significant relationship between investing in information technology and performance. The above findings are not consistent with previous studies conducted by Kelley (1994), Siegel and Griliches (1992), Diewert and Smith (1994), Hitt and Brynjoltsson (1995), Dewan and Min (1997); Devaraj and Kohli (2003). Research conducted by Nengah, (2005) also found that information technology contributes a positive and insignificant value to business process performance and competitive dynamics. The regulation and management of information technology in companies with integrated business units have important implications for the company's ability to utilize cross-unit synergies (Brown and Magill 1994, 1998; Sambamurthy and Zmud 1999; Weil and Broadbent 1998; Weill and Ross 2004). The concept of cross-business synergy is central to the performance of companies integrated business units with a diverse business portfolio (Goold and Luchs, 1993; Tanriverdi and Venkatraman, 2004).

Hypothesis 2: There is a positive relationship between Information Technology Capabilities and SME's performance

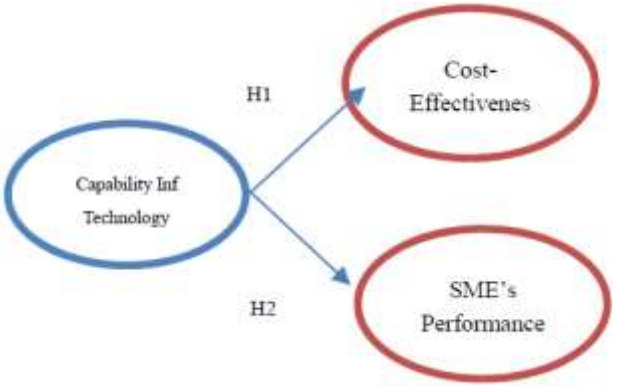

Fig. (1). Theoretical Model.

3. METHODOLOGY

This type of research is explanatory research. The quantitative method in this study was used to empirically examine the role of technology capabilities on SME's cost efficiency and performance. The sample in this study is a manager of SMEs at the Palm Sugar SME's in Lebak Regency, Banten province. Criteria for the selection of the sample in the study is aimed at the sample (purposive sampling). To test the models and hypotheses used analysis of Structural Equation Modeling (SEM). In testing the model using SEM PLS (Partial Least Square).

In this study, data analysis using the Partial Least Square (PLS) approach using WarpPLS software. PLS is a structural equation model (SEM) based on components or variances. According to Ghozali (2016), PLS is an alternative approach that shifts from a covariance-based SEM approach to variant-based one.

Covariance-based SEM generally tests causality/theory, while PLS is a more predictive model. PLS is a powerful analysis method (Wold, 1985; Ghozali, 2016) because it is not based on many assumptions. For example, the data must be normally distributed; the sample does not have to be large. Besides being able to be used to confirm theories, PLS can also be used to explain the presence or absence of relationships between latent variables. PLS can simultaneously analyze constructs formed with reflexive and formative indicators. This cannot be done by SEM, which is based on covariance because it will become an unidentified model.

4. RESULT AND DISCUSSION

4.1. Outer and Inner Model Testing

In testing the reliability value of a construct, the value used for Cronbach's Alpha and Composite Reliability is where both values are greater than 0.7 (> 0.7) for confirmatory research and greater than 0.6 (> 0.6) for exploratory research is still acceptable. (Hair et al., 2010, 2011; Pirouz 2006; Ghozali 2016). Furthermore, the average variances extracted (AVE) value of the construct must be above 0.5 (> 0.5). (Bagozzi and Baumgartner, 1994; Ghozali, 2016).

Based on the approach in the reliability test above, the following are presented the values of Cronbach's Alpha, Composite Reliability, Average variances extracted from each construct of this study with confirmatory factor analysis with WarpPLS 5.0.

Table 1. Score of Composite reliability coefficient, Cronbach alpha coefficients and Average variances extracted.

	ITC	CE	PERF
Composite reliability coefficients	0.905	0.921	0.880
Cronbach alpha Coefficients	0.873	0.905	0.834
Average Extracted	0.615	0.519	0.555

Table **1** shows that the composite reliability value of the construct studied was above the recommended threshold, where the composite reliability value was greater than 0.6 (> 0.6), namely: ITC of 0.905, CE of 0.921, and PERF of 0.880.

Cronbach alpha coefficient value of each construct is above the recommended threshold, where the Cronbach alpha coefficient value is greater than 0.6 (> 0.6), namely: ITC of 0.873, CE of 0.905, and PERF of 0.834.

Average variances extracted (AVE) value of each construct is above the recommended threshold, where the AVE value is greater than 0.5 (> 0.5), namely: ITC of 0.615, CE of 0.519, and PERF of 0.555.

Based on the value of composite reliability, Cronbach alpha coefficient and Average variances extracted from the ITC, CE, and PERF constructs that are above the recommended threshold, then all constructs have met the composite reliability requirements

4.2. Full Model Testing

The results of testing the full research model with WarpPLS 5.0 are presented in Fig. (**2**), Table **2** and Table **3**.

Table 2. Model Fit dan Quality Indice Full Model.

Average Path Coefficient (APC)= 0.833, P<0.001
Average R-Squared (ARS) = 0.698, P<0.001
Average adjusted R-Squared (AARS) = 0.696, P<0.001
Average full collinearity VIF (AAVIF)= 4.895, acceptable if <= 5, ideally <= 3.3
Tenenhaus GoF (GoF) = 0.623, small >= 0.1, medium >= 0.25, large >= 0.36

Based on the Model Fit and Quality Indice Full Model output presented in Table **2**, it is known that the Average path coefficient (APC) has an index of

0.833 with a p-value <0.001, Average R-squared (ARS) has an index of 0.698 with a p-value < 0.001 and Average adjusted R-squared (AARS) have an index of 0.696. The p-value for APC, ARS, and AARS that is recommended as a fit model is 5 0.05 (Ghozali and Latan, 2017; Kock, 2012). Thus it can be concluded that this study is fit. This is also supported by the value of Average full collinearity VIF (AAVIF) = 4,895, less than the value of 5 (acceptable). Thus indicating that there is no multicollinearity problem between indicators and between exogenous variables. The predictive power of the model described by GoF is 0.713, including the large category because it is greater than 0.36.

Table **3** presents the structural model analysis outputs about R-squared (R2), Adjusted R-squared (Adj. R2), Full Collinearity VIF and Q-Squared (Q2). R2 shows the percentage of endogenous construct variance/criterion can be explained by the construct hypothesized to influence it (exogenous / predictor) (Sholihin and Ratmono, 2014). Adj. R2 is similar to R2 but is used to avoid estimation bias in R2, because the more predictor variables in the model, R2 will be greater and continue to increase (Ghozali and Latan, 2016). Criteria for R2 and Adj. R2 ≤0.70, ≤0.45, and ≤0.25 show strong, moderate, and weak models.

Table 3. R-Squared, Adj R-Square and Full Collin VIF.

	ITC	CE	PERF
R-squared			0.562
Adjusted R-squared		0.802	0.559
Full Collin VIF	4.973	4.962	3.360

Based on Table **3**, it can be seen that R-squared (R2) and Adjusted R-squared (Adj. R2) of this research model tend to be moderate because the Barada is above 0.25%. Full Collinearity VIF is used to check whether collinearity problems occur vertically or laterally (Ghozali and Latan, 2017). The criterion for a model that is free from vertical and lateral multicollinearity problems is that the Full Collinearity VIF value must be lower than 3.3. However, values ≤5 are still acceptable (Ghozali and Latan, 2017; Sholihin and Ratmono, 2014; Kock, 2012). Based on table 3, it can be seen that the model used in this study is free from the problem of vertical or lateral collinearity. Because all VIF Full Collinearity values are less than 5.

After the structural model has been declared fit and can be accepted by data quality testing, then analysis and interpretation of the structural model will be used to test the research hypothesis. Bootstrapping method for research models with SEM Analysis with WarpPLS 5.0 of each construct with the following results: R-squared (R2), Adjusted R-squared (Adj. R2), and Full Collinearity VIF.

Table 4. Path Coefficient, *p*-value and Effect Size Full Model.

Relationship	Estimate	Effect Size	*p*-Value	Decision
ITC □ CE	0.897	0.804	(<0.001)*	H1 : Accepted
ITC□PERF	0.750	0.562	(<0.001)*	H2: Accepted

The variation of certain exogenous variables to endogenous variables is called effect size. Effect size measures the contribution of variants from each predictor in the R-Square coefficient model of a particular endogenous variable. Effect sizes can be grouped into three categories, namely weak (0.02), medium (0.15), and large (0.35) (Sholihin and Ratmono, 2014).

Based on table **4**, it can be seen that the variable Information Technology Capability (ITC) has the biggest effect size on the Cost-Effectiveness (CE) variable, which is 0.804. The effect size of the effect of ITC on the PERF variable of 0.562 is also quite large. Thus it can be concluded that Information Technology Capability (ITC) has a greater role from the perspective of Cost-effectiveness (EC) compared to PERF.

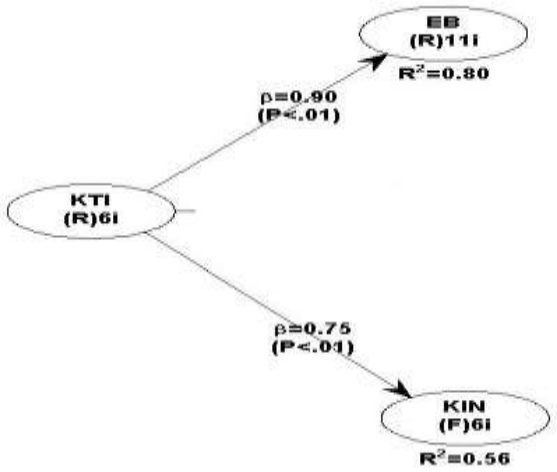

Fig. (2). Output WarpPLS 5.0 Full Model.

4.3. Hypothesis Testing

Hypothesis 1 states that Information Technology Capability (ITC) has a significant positive effect on Cost-effectiveness (CE). To prove this hypothesis, a direct effect test was conducted with WarpPLS version 5.0. Tests performed are model fit testing, path coefficient analysis, and p-value. The test results are presented in Figure 2; Table 2; Table 3 and Table 4. Based on table 2, it is known that the model fit criteria have been met, where the APC, ARS, AARS values are below 0.05, the AFVIF value <5, and the GoF value are included in the large category that is above 0.36. Table 4 presents the path coefficients produced are 0.897 and significant with p values <0.001 (α1%). Thus it can be concluded that hypothesis 1 is accepted. This means that Information Technology Capability (ITC) has a significant positive effect on Cost-Effectiveness (CE) with a coefficient of determination of 0.804 shown in table **3**.

Hypothesis 2 states that Information Technology Capability (ITC) has a significant positive effect on Business Performance (PERF). To prove this hypothesis, a direct effect test was conducted with WarpPLS version 5.0. Tests performed are model fit testing, path coefficient analysis, and p-value. The test results are presented in Fig. (**2**); Table **2**; Table **3** and Table **4**.

Based on table **2**, it is known that the criteria for model fit have been fulfilled, where the APC, ARS, AARS values are below 0.05, AFVIF values <5, and GoF values are included in the large category above 0.36. Table **4** presents the path coefficients produced are 0.750 and significant with p values <0.001 (α1%). Thus it can be concluded that hypothesis 2 is accepted. This means that Information Technology Capability (ITC) has a significant positive effect on SME's Performance (PERF) with a coefficient of determination of 0.562 shown in Table **3**.

4.4. Summary of Hypothesis Testing

General conclusions in testing hypotheses to answer research questions can be seen in table **5**.

Table 5. Summary of Hypothesis Testing Results.

Hypothesis	Hasil Pengujian	Decision
Hypothesis 1 : There is a positive relationship between Information Technology Capabilities and costeffectiveness.	Significant (+) coefficient 0,804 score p<0,001	Accepted
Hypothesis 2 : There is a positive relationship between Information Technology Capabilities and SME's performance	Significant (+) coefficient 0,562 score p<0,001	Accepted

4.5. Discussion

This section will discuss research findings that have been analyzed and tested in the previous section. The discussion is based on the value of the results of statistical testing with WarpPLS 5.0 software, which is based on the building of theory and empirical research referred to and developed in this study. The discussion will be conducted based on the results of data analysis and hypothesis testing proposed in this study and the relationship with the findings from previous studies

4.5.1. Information Technology Capability (ITC) Has a Significant Positive Effect on Cost-Effectiveness (CE)

Hypothesis 1 of this study states that Information Technology Capability (ITC) has a positive effect on Cost-Effectiveness (CE). The test results using WarpPLS 5.0 show a path coefficient of 0.897 and a p-value <0.01. Based on these figures, it is concluded that hypothesis 1 can be accepted, meaning that Information Technology Capability (ITC) has a positive effect on Cost-Effectiveness (CE).

Chriswan and Mahmudin (2008) stated that information technology offers many opportunities to reduce costs, increase efficiency, increase effectiveness and revenues, and can improve cost control. Sophisticated technology and information can help companies to monitor the activities carried out by their employees, so the company can obtain information more quickly and accurately used in decision making. If a mistake or deviation occurs, the company can im-

mediately take corrective actions so that the effectiveness in the use of operational costs can be identified quickly so that the company's goals can be achieved. Previous research supporting this research was a study conducted by Salim Ridwan (2014) and Ilker Calayoglu & Murat Azaltun (2013), which suggested that information technology significantly influences the effectiveness of cost control in an organization.

Cost control must primarily be aligned with the goals to be achieved by the company, one of the goals to be achieved by the company is to obtain maximum profit by issuing the lowest costs, therefore by controlling the production costs, the company hopes to get a large profit. A company in order to compete in a market environment, the company is also required to be able to create a good product innovation, and the price is lower or at least the same as the price offered by its competitors.

4.5.2. Information Technology Capability (ITC) Has a Significant Positive Effect on SME's Performance (PERF)

Hypothesis 2 of this study states that Information Technology Capability (KTI) has a positive effect on Business Performance (KIN). The test results using WarpPLS 5.0 show the path coefficient of 0.750 and p-value <0.01. Based on these figures, it is concluded that hypothesis 3 can be accepted, meaning that Information Technology Capability (KTI) has a positive effect on Business Performance (KIN).

This hypothesis is supported by previous researchers finding a significant relationship between information technology and performance. Kelley (1994), Siegel, and Griliches (1992) state that some of the results of the study found a positive effect of information technology on company performance at the industry level. Diewert and Smith (1994), Hitt and Brynjoltsson (1995), Board and Min (1997), Devaraj and Kohli (2003) indicate that there is a positive relationship between technology and company performance.

However, this research is not supported by Devaraj and Kohli (2003), stating that there are some studies that do not find a significant relationship between information technology and performance. Baily (1986), Roach (1987), Morrison and Berndt (1991), Devaraj and Kohli (2003) find a negative relationship between information technology relatedness variables that are associated with firm performance. In addition, Berndt and Morrison (1995) and Kohli (1999) find that there is no significant relationship between investing in information technology and performance.

The above findings are not consistent with previous studies conducted by Kelley (1994), Siegel and Griliches (1992), Diewert and Smith (1994), Hitt and Brynjoltsson (1995), Council and Min (1997); Devaraj and Kohli (2003). Research conducted by Nengah (2005) also found that information technology contributes a positive and insignificant value to business process performance and competitive dynamics.

5. CONCLUSION

With information technology, a company's activities can be carried out effectively and efficiently in costs because with faster operational activities, and greater profits will be obtained by the company. Chriswan and Mahmudin (2008) stated that information technology offers many opportunities to reduce costs, increase efficiency, increase effectiveness and revenues, and can improve cost control.

This study found a relationship between Information Technology Capability and SME's Performance. This hypothesis was supported by previous researchers finding a significant relationship between information technology and performance. Kelley (1994), Siegel, and Griliches (1992) state that some of the results of the study found a positive effect of information technology on company performance at the industry level.

REFERENCES

Arifin, Ikhsan Nurul. 2016. Analisis Target Costing Dalam Upaya Pengurangan

Biaya Produksi Untuk Peningkatan Laba Kotor Pada Mandala Bakery. Jurnal Berkala Ilmiah Efisiensi. Vol 6. No.3.

AD Ramdansyah dan HER Taufik, 2017. Adoption Model of E-Commerce from SMEs Perspective in Developing Country Evidence – Case Study for Indonesia, European Research Studies Journal Volume XX, Issue 4B, 2017.

Alexandru-Emil Popa, 2014. The Financial Factors that Influence the Profitability of SMEs, International Journal of Academic Research in Economics and Management Sciences., Vol. 3, No. 4.

BC Shia, AD Ramdansyah, S Wang, 2014. Forecasting E-T Commerce Trend in Indonesia, Proceedings of the 19 International Conference on Information Quality (ICIQ).

BC Shia, M Chen, AD Ramdansyah, S Wang, 2015.

Comparison of Decision Making in Adopting ECommerce between Indonesia and Chinese Taipei (Case Study in Jakarta and Taipei City), American Journal of Industrial and Business Management, 2015, 5, 748-768.

BC Shia, M Chen, AD Ramdansyah, S Wang, 2016. Measuring Customer Satisfaction toward Localization Website by WebQual and Importance Performance Analysis (Case Study on AliexPress Site in Indonesia), American Journal of Industrial and Business Management, 2016, 6, 117-128.

Davis, F.D, 1989. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly,13, 319-340.

Fabrizio Gilardi, 2010. Who Learns from What in Policy Diffusion Processes.American Journal of Political Science 54(3):650– 666.

Hendrickson, A. R.; Massey, P. D.; Cronan, T. P. 1993. On the test-retest reliability of perceived usefulness and perceived ease of use scales. MIS Quarterly 17: 227-230

James N. K. Kinuthia and David M. Akinnusi, 2014. The magnitude of barriers facing e-commerce businesses in Kenya, Journal of Internet and Information system, Vol. 4(1), pp.12-27.

Jordana, J. 2011. The Global Diffusion of Regulatory Agencies: Channels of Transfer andStages of Diffusion. Comparative Political Studies 44 (10): 1343–1369.

Jumayah Abdulaziz Mohammed, Mahmoud Khalid Almsafir and Ahmad Salih Mheidi Alnaser, 2013. The Factors That Affects E-Commerce Adoption in Small and Medium Enterprise: A Review, Australian Journal of Basic and Applied Sciences, 7(10): 406412 ISSN 1991-8178.

Maryama,Siti. 2016. Peneraparan E-Commerce Dalam Peningkatan Daya Saing. Jurnal Liquidity. Vol.2 No.1.

Muhammed Kursad Ozlen, Ensar Mekic and Ena Kumbara, 2014. Perceived Benefits of E- Commerce among Manufacturing and Merchandising Companies, International Journal of Academic Research in Economics and Management Sciences, Vol. 3, No. 2, ISSN: 2226-3624

N Ummi, I Dwisvimiar, PF Ferdinant, AI Saeful, MM Utami; 2016. Pengembangan Proses Produksi Gula aren Semut di Kabupaten Lebak Melalui Modernisasi dan Implementasi Teknologi Spray Drier menuju GMP dan SII 2043-87, Publikasi Kegiatan Hi-Link dalam Seminar Internasinal ICBM.

Ondrej Zizlavsky, 2014. The Balanced Scorecard: Innovative Performance Measurement and Management Control System, Journal of Technology Management & Innovation, Volume 9, Issue 3.

Palupi, Ayu Tiara. 2016. Analisi Biaya Standar Untuk Mendukung Efisiensi Biaya Prodsuksi Perusahaan. Jurnal Administrasi Bisnis (JAB)|Vol. 36 No. 1.

Puryati, Dwi. 2017. Biaya Produksi, E-Commerce dan Penjualan Produk Pada Sentra Kaos Bandung. Jurnal Online Insan Akuntan, Vol.2, No.2 Desember 2017, 217 - 228

Rogers, Everett M. 1983. Diffusion of innovations (3rd ed.). New York: Free Press of Glencoe. ISBN 9780029266502.

Saleh dan Hadiyat (2016). Penggunaan Teknologi Informasi di Kalangan Pelaku Usaha Mikro Kecil Menengah di Daerah Perbatasan (Studi di Kabupaten Belu Provinsi Nusa Tenggara Timur). *Jurnal Pekommas, Vol. 1 No. 2, Oktober 2016: 141 - 152*

Segars, A. H.; Grover, V., 1993. Re-examining perceived ease of use and usefulness: A confirmatory factor analysis. MIS Quarterly 17: 517–525.

Venkatesh, V.; Morris, M. G.; Davis, G. B.; Davis, F. D., 2003. User acceptance of information technology: Toward a unified view. MIS Quarterly 27 (3): 425–478.

Wasfi Alrawabdeh, 2014. Environmental Factors Affecting Mobile Commerce Adoption - An Exploratory Study on the Telecommunication Firms in Jordan, International Journal of Business and Social Science, Vol. 5, No. 8

Received: July 15, 2023 Revised: July 18, 2023 Accepted: July 22, 2023