

ACCEPTANCE ANALYSIS OF AIS SYSTEM BY USING TAM AT PT. ASUKA ENGINEERING INDONESIA

Bagus Ardianto¹, Trianggoro Wiradinata²

Universitas Ciputra Surabaya

INDONESIA

Email: ¹bagus.asuka@gmail.com, ²twiradinata@ciputra.ac.id

ABSTRACT

This study intends to know the influence of *Perceived Usefulness (Xi)*, *User Ease Perceived (X2)* and *Technology Risk Perceived (X3)* to *Intensity in Using System (Y)* of AIS system at PT. Asuka Engineering Indonesia. The right theory to test the variables that influence AIS system is *Technology Acceptance Model (TAM)* that is published by Davis et al. (1989). The samples of this study are the users of AIS system in PT. Asuka Engineering Indonesia. The total samples of this study are 63 respondents. The data processing will be done using multiple linear regression analysis. Results show that Perceived Usefulness has a significant positive effect on intention to use AIS system. Perceived Ease in Use, and Perceived Risk in Technology does not give significant effect to intention to use AIS system.

Keywords: *Perceived Usefulness, Perceived Ease to User, Perceived Risk in Technology, Intention to Use System.*

INTRODUCTION

The industrial world is currently experiencing growth in business activities in various business sectors in Indonesia. The construction service industry is one part of industrial business sector that is quite large contributing to Indonesia's economic growth.

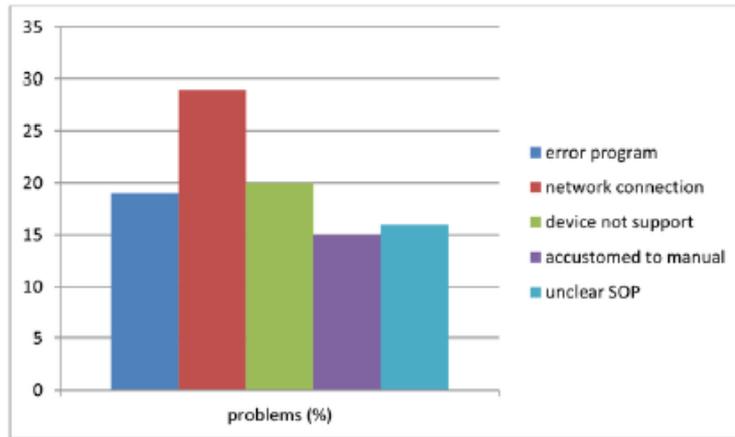
The construction service industry has some strategic roles in development. They are broad supply chain reach, employment, stimulation to other supporting sectors, even growth mobilization of national product both goods and services.

PT. Asuka Engineering Indonesia is a company engaged in *Engineering and Construction*. It is no stranger to the project designers. This describes that the cost owner served is not small. This company also has many branches in some regions. This shows that this company is a company in Engineering and Construction sector that is quite big in Indonesia.

Recently, PT Asuka Engineering Indonesia has continued to increase its business income level. One of the strategies taken by company management is implementing a data processing system for all activities contained within the company with information technology – based (IT). AIS (Asuka Integrated System) program uses *data base* system, Web - based (PHP) program and MySQL database. The AIS was tested in 2013 which data processing and users were still limited. At the beginning of 2014, the system was declared perfect and applied to all activities by the users including all management, office staff, and structure on the project management system in each project area. User access is very easy because the system application can be accessed anywhere as long as internet network can be accessed.

AIS is designed in order to users can access, input, control, and monitor projects and supporting activities without limits or real time. So those, the system can improve work effectiveness and efficiency.

Of course, the implementing the AIS (*Asuka Integrated System*) is not easy. There are so many obstacles and problems that arise from implementing of this AIS system. The problems that exist in the AIS system can be summarized as follows:



Picture 1. The problem sample data diagram of AIS system

In this study, the researcher conducted research on the AIS system focusing on the level of acceptance. The research can be done by using many kinds of theory and model approach. One of the models to estimate and explain the using of computer technology is *Technology Acceptance Model* (TAM). TAM model developed by Davis F. D is one of the most widely used in IT research because it is simpler and easier to apply. Besides that, Ven Katesh and Davis in their analysis state "TAM is considered capable of providing the best contribution in predicting and explaining user acceptance of computer technology in an organization. (Ven Katesh et al., 2003).

From the information above, it is necessary to do the study with a research entitled "Acceptance Analysis of AIS system by using TAM at PT. Asuka Engineering Indonesia". TAM is useful to find out how much interest in adopting research or new system is accepted by users.

This study intends to analysis and to know the significance influence between *perceived usefulness, perceived ease of use and perceived risk in technology* to intention of using AIS system.

LITERATURE REVIEW

Intention is the position of person in the dimension of subjective probability that involves a relationship between him/her self and several action. (Riyanti, 2007).

Intention consists of four elements. They are:

- Specific behavior
- Target object directed at behavior
- Situation is done behavior
- Time is done behavior
-

1. Intention to Use System

Intention to use the system (Behavioral Intention to Use) is specific behavior and operated by using direct question such as "I mean " with respond choices of Likert scale to measure relative intention power Intention has been shown in measurement by other synonyms , such as " I plan to" and it is different with a similar desire and own prediction (Annitage et al., 2001). Intention to use (Behavioral Intention to Use) system reflects how hard someone is ready to try, and how motivated he is to do the behavior (Ajzen, 1991).

In this study, intention that the writer means is the level of assessment of AIS system user on the intensity of system usage in operating activities in working in PT. Asuka Engineering Indonesia. The result of writing assessment will be concluded that how important is the AIS system needed at PT. Asuka Engineering Indonesia.

2. Perceived Usefulness

Perceived usefulness which is applied in Actual Use has strong relation (Davis, 1989). The statement of (Sun et al., 2006) agreed to the result of the research (Davis, 1989) that the relationship of Perceived Usefulness with attitude, behavior intention to use has consistent value in the result. The application and implementation, the measurement Perceived Usefulness uses four question indicators (Wu, 2011).

At this writing, perceived that the writer means is the level of measurement of AIS system user on the system usefulness in work activities in PT. Asuka Engineering Indonesia. Then, the result of the writing assessment will be concluded that how useful the AIS system is applied in PT. Asuka Indonesia.

3. Perceived Ease of Use

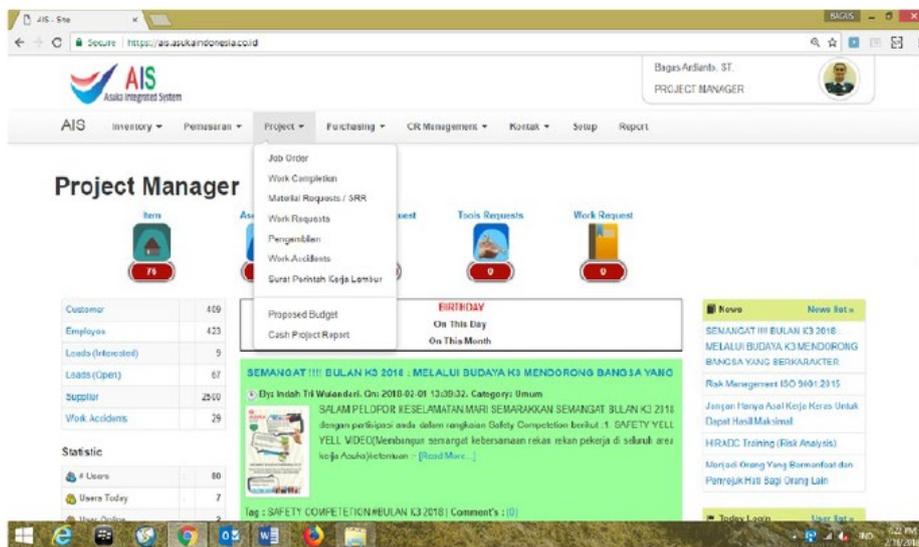
Perceived Ease of Use is a level of perceived of use about ease in using an AIS technology system. The perceived will have an impact on someone's intention in using the technology (Intention to Use) (Shih, 2004), Perceived Ease of Use significantly influences Perceived Usefulness (Pedersen, 2003) and (Sw1 et al., 2006).

4. Perceived Risk in Technology

Perceived Risk in Technology is defined as a risk that is felt by users and their tolerance level towards risk taken that influence a decision (Chan et al., 2004). The risk felt show that users can be influenced by their feeling like anxious, afraid, inconvenience, uncertain to AIS system use.

5. AIS (Asuka Integrated System)

AIS (Asuka Integrated System) is a web-based application that is a company innovation strategy in processing company activities online and real time. And the processed data covers several departments' need. They are Marketing , HSE (Health, Safety Environment) , HRD (Human Resources Department), GA (General Manager), Accounting and Finance, Production, Procurement , And Engineering. The system is a device that connects between departments in running the required processes.



Picture 2. Dashboard AIS (Asuka Integrated System)

6. Technology Acceptance Model (TAM)

In 1986, Technology Acceptance Model (TAM) was introduced firstly. TAM theory is an individual or a group acceptance in a computer technology that reflects to two certain acceptors. They are Perceived Usefulness and Perceived Ease of Use. This technology acceptance model is one of improvisation from Theory of Reasoned Action (Davis, 1986). AIS system is a new system and PT. Asuka Engineering Indonesia has not implemented a database system before.

From this reason, writer wants to prove whether *perceived usefiftness*, *perceived ease of use* and *perceived risk in technology* have influences on intention to using AIS system. The expectation of writing will be able to change the level of intention to use AIS system in every work activities in PT. Asuka Engineering Indonesia.

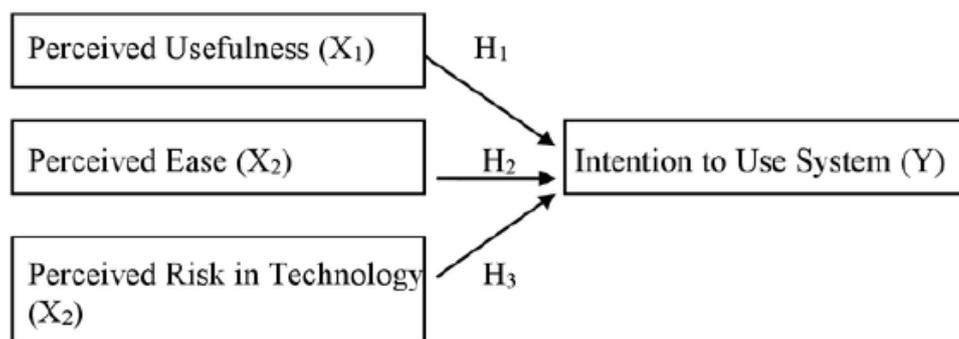
RESEARCH METHODS

The method that is used in this study is descriptive with quantitative analysis and the method of data collection uses questionnaire data method. The samples are taken from all users or each user from any departments at PT. Asuka Engineering Indonesia. The number of samples in this study is 62 respondents. The result of collected questionnaire data were measured using Likert scale then processed using SPSS software verse 23.

Based on the aim of analysis and aspects analyzed in this study concerning with AIS system acceptance at PT. Asuka Engineering [ndonesia using TAM (Technology Acceptance Model), writer takes four research factors to be analyzed descriptively. They are *perceived usefulness*, *perceived ease of use*, *perceived risk in technology*, and intention to use AIS system (Behavioral Intention to Use).

RESULT AND DISCUSSION

Hypothesis in this study purposes to know whether there is relationship between free/independent variable and dependent variable. The following is a model analysis in this study.



Picture 3. Analysis Model

Generally, this study shows enough satisfactory result. The results of descriptive analysis show that respondents' assessment to any variables of this study in general is good. Explanation of the discussion of each respondent profile, variables and test result of hypothesis will be explained as follows:

1. Respondent Characteristic

Sample used in this study is 62 respondents. All of them are the users of AIS system in PT. Asuka Engineering Indonesia. The characteristics of the users in general are: 1. Almost of respondents are male, 2. The scale age is 36-55 years old, 3. The users work location of AIS system in general are at head office of PT. Asuka Engineering Indonesia in Gresik East Java, 4. Generally, the users of AIS system active in using social media, 5. In scale period of working, the users of AIS system mostly is a new worker, 1-2 years of work. And 6. Seen from the level of education, the users of AIS system is university level (D1, D3, S1).

2. The Result Of Measurement of The Respondents Variable

The variables from this study are perceived usefulness variable, perceived ease in use variable, and perceived risk in technology variable to intention variable to use AIS system in PT Asuka Engineering Indonesia. The analysis data is gain based on questionnaires on study object which has been delivered to 62 respondents. The results are as follows.

Table 1. Variable Date of Perceived Usefulness

No	The statements	Total answer					Mean	Deviation standard
		Percentage (%)						
		1	2	3	4	5		
1	It is easy for me to operate AIS system			6	34	22	4.26	0.626
			9.68	54.84	35.48			
2	We get easiness to lighten our work by using AIS system			3	33	26	4.37	0.579
			4.84	53.23	41.94			
3	AIS system is easy in access			6	31	25	4.31	0.642
			9.68	50.00	40.32			
4	I have competence to operate and use the AIS system			12	33	17	4.08	0.685
			19.35	53.23	27.42			
Perceived usefulness (X1)							4.25	
1: extremely disagree 2: Disagree 3: neutral 4: Agree 5: extremely agree								

Table 2. The Variable Data of Perceived Ease in Use

No	The statements	Total answer					Mean	Deviation standard
		Percentage (%)						
		1	2	3	4	5		
1	With the AIS system, I get more efficient in managing project or work		3	8	31	20	4.10	0.804
			4.84	12.90	50.00	32.26		
2	The AIS system is very useful to run any projects		1	8	34	19	4.15	0.698
			1.61	12.90	54.84	30.65		
3	The AIS system makes me more communicative between other departments		3	9	33	17	4.03	0.789
			4.84	14.52	53.23	27.42		
4	The AIS system makes me more precision in controlling the project		4	11	31	16	3.95	0.838
			6.45	17.74	50.00	25.81		
5	Using The AIS system make it easier to get the latest or the most up-to-date information		4	12	23	23	4.05	0.913
			6.45	19.35	37.10	37.10		
Perceived ease in use (X2)							4.05	
1: extremely disagree 2: Disagree 3: neutral 4: Agree 5: extremely agree								

Table 3. The Variable Data of Perceived Risk in Technology

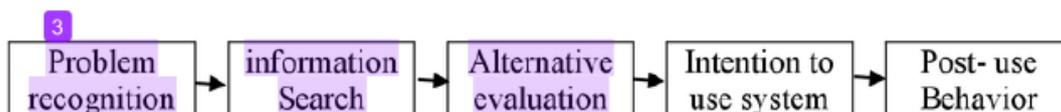
No	The statements	Total answer					Mean	Deviation standard
		Percentage (%)						
		1	2	3	4	5		
1	The AIS system depends on the use of technology on the device that I use			7	40	15	4.13	0.586
				11.29	64.52	24.19		
2	The AIS system uses the right software technology system and as needed		1	7	37	17	4.13	0.665
			1.61	11.29	59.68	27.42		
3	The AIS system is safe in processing data		4	7	38	13	3.97	0.768
			6.45	11.29	61.29	20.97		
4	The AIS system dashboard is simple, easy and interesting		2	10	35	15	4.02	0.735
			3.23	16.13	56.45	24.19		
Perceived risk in technology (X3)							4.06	
1: extremely disagree 2: Disagree 3: neutral 4: Agree 5: extremely agree								

Table 4. Variable Data of Intention in Using System

No	The statements	Total answer					Mean	Deviation standard
		Percentage (%)						
		1	2	3	4	5		
1	I will use AIS system continuously to complete my project activities			7	38	17	4.16	0.606
				11.29	61.29	27.42		
2	I will develop AIS system continuously to complete my project activities			11	29	22	4.18	0.713
				17.74	46.77	35.48		
3	I believe that the AIS system is exactly effective and efficient			15	30	17	4.03	0.724
				24.19	48.39	27.42		
Intention in using system (X4)							4.12	
1: extremely disagree 2: Disagree 3: neutral 4: Agree 5: extremely agree								

3. The Description of Tested Hypothesis

Simultaneously, the influence of perceived usefulness variable, perceived ease in use variable and perceived risk in technology variable to intention variable to use the system in this study shows that all variables influence simultaneously to intention to use the AIS system in PT. Asuka Engineering Indonesia. The AIS users tend to get usefulness about AIS system then try to get some information about using the system before applying the system. Then, they ask for some functions in the system whether it is easy and interesting or not. Finally, they will observe whether the technology used is appropriate in operating or not before making decision in intensity to use the AIS system. This is supported by Ajzen's opinion (Ajzen, 1991). He stated that the decision process in the intention to use the system consists of several steps as follows:



Picture 4. The Step of Making Decision

4. T Test (Partial)

T *Test* is used to test independent variable influence partially to dependent variable . The following is t test to each variable. If the significant value is lower than 0.05 it means that the variable X has significant influence to variable Y. If the significant value is more than 0.05, it means that the variable X does not have significant influence to variable Y.

Table 5. The Result of T Test

Model	Un standardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0,874	0,411		2,127	0,038
X1M	0,492	0,133	0,483	3,695	0,000
X2M	0,185	0,117	0,225	1,586	0,118
XJM	0,100	0,133	0,101	0,749	0,457

a. The Influence of Perceived Usefulness to Intention of Using System In table 5, the result of test shows that the value of regression coefficient from variable X1 is 0.492 and significant value of test is 0.000. Because significant value is lower than 0.05, so that it is concluded that X1 influence significantly and partially to intention to use Y system. It can be interpreted that the more X1 increase , the intention to use the system will increase.

The following are the finding of the data on the result of this study assessed to contribute to usefulness variable which has a significantly effect. Those are as following:

1. the average of all indicators from perceived usefulness variable is 4.25. It means that the respondents aware how useful the AIS system is. 2. The lowest average from the respondents' answer is 4.08 in " I have competence to operate and use AIS system" indicator. It means that this factor is needed to improve to achieve the target in intention to use the system . 3. The highest average of respondents' state that " with the AIS system, we are given convenience to lighten my work" . This indicates that the AIS system is efficient if it is used intensively. 4. In respondent characteristic whose age is 1-2 years old and as new employee category, this makes it possible as a contributor that with relatively new experience , so according to the experience in using the system is not still deep yet. 5. There are many respondents in the data on the characteristics of work location outside the head office. This results in the lack of easy access to the system.

b. The Influence of Perceived Ease in Use To Intention to Use The System

In table 5, the result of test shows that the value of regression coefficient from variable X2 is 0.185 and significant value of test is 0.118. Because the significant value is more than 0.05, so that it is concluded that X2 does not influence significantly and partially to intention to use Y system.

Thus, it can be concluded that intention to use AIS system does not matter perceived ease of use. Supported by the result of research through some questionnaires statements in perceived ease in use 79.7 % from the total respondents' state agree and disagree , the researcher observes that it happened because there is skill competence level of user who easily and usual operates information technology or online system. The indicator that supports this case is the majority of respondents' are high education (D1, D3, D4 and S1) in respondents' data. And almost respondents are active in using social media.

c. The Influence of Perceived Risk in Technology to the Intention to Use the System.

In table 5, the result of test shows that the value of regression coefficient from variable X3 is 0.100 and significant value of test is 0.457. Because significant value is more than 0.05, so that it is concluded that X3 does not influence significantly and partially to intention to use Y system. This can be stated that the willing and intention to use AIS system does not matter perceived risk in technology.

The researcher observes that there is respondent factor with the majority work location (59.7 %) located in head office. This causes the facility of technology both hardware and software can be handled quickly by IT staff that is at head office everyday if there is any problem in using AIS system.

5. The Implication of The Result of Study

This research theoretically has implication for providing knowledge about the implications of an AIS data base system (Asuka Integrated System). And the development of the AIS system relates to the influence of perceived usefulness to intention to use AIS system. This research can be used as a reference source for all company owners in East Java about the application of an AIS database system (Asuka Integrated System) to system innovation and to help the performance of company. The finding in this research explains that perceived usefulness influences intention to use the system directly. Thus, the results of this study can determine the steps of managerial implication in determining the step after the research.

Research Findings	Step After Research
<p>The findings in this study explain that:</p> <ol style="list-style-type: none"> 1. The average of all indicators from perceived usefulness is 4.25. It means that respondents aware how useful AIS system to be applied. 2. The lowest average of respondents answers (The lowest average) is 4.08 indicator " I have skill competence to operate and use AIS system" . It means that this is a factor that is needed to be Developed to achieve the target in intention to use the system . 3. The highest average of respondents' state that " We get easiness to lighten our work by using AIS system" . It indicates that the AIS System is efficient if it is used intensively. 4. On the characteristics of respondent, the majority of users AIS system are 1-2 years working period or in the new employee category. 5. There are a lot of respondents on the data of characteristic of work place that are far away from head office 	<p>The following is suggested programs in management as a step to improve, including:</p> <ol style="list-style-type: none"> 1. It is expected to add refreshment training at least twice a year and be stated in internal management memorandum so that AIS system user will get usefulness and knowledge from new features in the AIS system up-to date especially for new employees who has worked for 1-2 years. 2. SOP or manual instruction book as a reference for operating the AIS system is expected to always be updated because the features in the AIS system continue to grow.

CONCLUSION

Based on the results of data analysis and discussion in this study, conclusion can be obtained as follows:

1. Perceived usefulness is the most dominant and significant variable which influences to intention to use the AIS system at PT. Asuka Engineering Indonesia.
2. Partially, the influence of perceived ease in use variable is not significant to intention to use the AIS system at PT. Asuka Engineering Indonesia.
3. The influence of perceived risk in technology variable is not significant partially to intention to use the AIS system at PT. Asuka Engineering Indonesia.

SUGGESTION

Based on data analysis and discussion in this study, suggestion can be obtained as follows:

1. Suggestion for Research

To everyone who interests and wants to conduct research in the same object in the future, it is suggested:

- a. Using different approach. That is qualitative approach in order to get deeper data from the AIS system at PT Asuka Engineering Indonesia.
- b. It is suggested to the next researcher to examine the influence between independent variables (perceived usefulness, perceived ease in use, and perceived risk in technology) so that the significance of influence between variables is known clearly.
- c. This study is used Technology Acceptance Model (TAM) with double linear regression analysis method. And it is suggested to the next research to use Unified Theory of Acceptance and Use of Technology (UTAUT) model with analysis method Structural Equation Modeling (SEM) or another model and method of analysis to get more accurate results of data processing and research results.

2. Advice for PT. Asuka Engineering Indonesia The recommended suggestions are:

- a. Adding refreshment training to the AIS system at least twice a year and stated in the internal management memorandum so that AIS users will get benefit and knowledge of new features in the AIS system up to date, especially for employees whose working period is 1-2 years.
- b. SOP or Manual Instruction book as a reference for operating the AIS system is expected to always be updated because the features in the AIS system continue to grow.

REFERENCES

- Acharya, Lasse Hje Pedersen. (2003). *Asset Pricing Liquidity Risk*. Journal of Financial Economic.
- Ajzen, I. (1991). *The Theory of Planned Behavior*. Organizational Behavior and Human Decision Processes.
- Ali, Murad., Raja Yaacob, R. A. I. B., Endut N. Al Amin B., Makki, Bilal, Iftikhar. (2017). *Determining the academic Use of Social Media with Technology Acceptance Models*. Malaysia: Universiti Teknologi PETRONAS.
- Armitage, CJ & Conner, M. (2001). *Efficacy of The Theory of Planned Behavior: A Meta Analytic Review*. British Journal of Social Psychology.
- Sadan Pusat Statistik (BPS) (2016). *Konstruksi Dalam Angka 2016*. Katalog BPS 6301005 diakses pada 2 Februari 2018. dari <http://www.bps.go.id/>
- Barrie, Donald S. & Paulson, Boyd C., (1987). *Manajemen Konstruksi Profesional*, Penerbit Erlangga, Jakarta.
- Chan, Siu-cheung dan Ming-te Lu, (2004). *Understanding Internet Banking Adoption and Use Behaviour*. A Hongkong Perspective, Journal of Global Information Management.
- Davis, F.D. (1986). *A Technology Acceptance Model/or Empirically Testing New End-User Information Systems: Theory and results*. Ph.D. dissertation, Massachusetts Institute of Technology.
- Davis, F.D. (1989). *Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology*. MIS Quarterly.
- Dum Pit, D. Z., Fernandez C. J. (2017). *Analysis of the use of social media in Higher Education Institutions (HE/s) using the Technology Acceptance Model*. Journal of Educational Technology in Higher Education.

- Duwi. (2011). *Analisis Regresi Linier Berganda*, diakses pada 10 Februari 2018 dari <http://duwiconsultant.blogspot.co.id/2011/11/analisis-regresi-linier-berganda.html>
- Eriksson, Kent, KatTi Kerem, and Danie Nilsson. 2008. *The adoption of commercial innovations in the former Central and Eastern European markets: The case of internet banking in Estonia*. International Journal of Bank Marketing. Vol 26 No. 3.
- Ilima, Yongbeom Kim, and Hyo-Joo Han. (2007). *The effects of perceived risk and technology type on users' acceptance of technologies*. Information & Management.
- Investopedia. (2018). *Simple Random Sample*, diakses pada 15 Februari 2018 dari <https://www.investopedia.com/terms/s/simple-random-sample.asp>
- Istijanto. (2009). *Aplikasi Praktis Riset Pemasaran*. Jakarta: Gramedia Pustaka Utama.
- Kinross, T. C., and Taylor, J. R. (1988). *Rise! Pemasaran*, Edisi ketiga, Jakarta: Erlangga.
- Kuncoro, Mudrajad. (2013). *Metode Riset untuk Bisnis dan Ekonomi*, edisi 4. Penerbit PT Erlangga, Jakarta.
- Lin, Marchal, & Within. (2014). *Teknik-teknik Statistika Dalam Bisnis & Ekonomi*, (15th ed.). Jakarta: Salemba Empat.
- M. Y. Wu, H.P. Chou, Y. C. Weng, and Y. H. Huang, (2011). *TAM2-based study of website user behavior-using web 2.0 websites as an example*, WSEAS Trans. Bus. Econ., vol. 8.
- Neuman, W. (2013). *Metode Penelitian Sosial: Pendekatan Kualitatif Dan Kuantitatif* (7th ed.). Jakarta Barat: PT Indeks.
- Priyatno, D. (2014). *SPSS 22: Pengolah Data Terpraktis* (1st ed.). Yogyakarta: Andi.
- Pusdatin (2017). *Analisis Perkembangan Industri*. Edisi April 2017. Kementerian Perindustrian Republik Indonesia.
- Schillewaert, N., Aheame, M. J., Frambach, R. T., & Moenaert, R. K. (2005). *The adoption of information technology in the sales force*. Industrial Marketing Management.
- Sekaran, Uma. (2009). *Research Methods for Business: Metodologi Penelitian untuk Bisnis*. Edisi 4. Buku 1. Jakarta: Salemba Empat.
- Shih, H.P. (2004). *An Empirical Study on Predicting User Acceptance of E-Shopping On The Web*. Information & Management.
- Siregar, Syofian. (2010). *Statistik deskriptif untuk penelitian*. Jakarta: Rajagrafindo Persada.
- Siregar Syofian. 2013. *Metode Penelitian Kuantitatif* Jakarta: PT Fajar Interpretama Mandiri.
- Sugiyono. (2014). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- Sun, Heshan and Ping Zhang. (2006). *Causal Relationship Between Perceived Enjoyment and Perceived Ease of Use: An Alternative Approach*. Journal of the Association for Information Systems.
- Sunyoto, Danang, 2009. *Analisis Regresi dan Uji Hipotesis*, edisi pertama, Media Pressindo, Yogyakarta.
- Venkatesh, Morris, M.G., Davis, G.B., and Davis F.D. (2003). *User Acceptance of Information Technology: Toward a Unified View*. MIS Quarterly, Vol.27, No.3.
- Wahyudi, Amin. (2009). *Jurnal Alamatansi dan Sistem Teknologi Informasi*. Penggunaan Teknologi Informasi di Dunia Bisnis dan Perbankan. Vol. 7 No. 1.
- Widarjono, A. (2015). *Statistic Terapan Dengan Excel Dan SPSS*. Yogyakarta: UPP STIM YKPN.
- Yulianidewi, Putu, Rim, Agustini, Ketu, and Pradnyana, I.M. Ardwi. (2016). *Analisis Penerimaan Sistem Absensi Wajah Dengan Menggunakan Technology Acceptance Model (Tam) Studi Kasus: Smk Negen 1 SngaraJa. Singaraja: Kannapati, UNDIKSHA*.