



DETERMINANTS OF THE INTENTION TO USE CORPORATE PORTALS: A PERSPECTIVE FROM AN INDONESIAN STATE-OWNED ENTERPRISE

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ABSTRACT

This research was intended to empirically determine the antecedents of users utilization of an internal portal. Factors found within the Unified Theory of Acceptance and Use of Technology (UTAUT), DeLone and McLean Information Systems Success Model, as well as the Technology Acceptance Model (TAM) were used as the basis to build the underlying research model. This research gathered 200 questionnaires from users of an internal portal in a state-owned enterprise in Indonesia. To test the hypothesis, the data obtained were tested using Structural Equation Modeling (SEM) aided by SmartPLS 2.0 software. This research showed that information quality, systems quality, facilitating conditions, social influence, and job relevance were factors that affected users' intention in using a portal.

Keywords: *Portals, Acceptance, DeLone & McLean, UTAUT, TAM, Structural Equational Modeling, SEM, PLS;*

1. INTRODUCTION

Any information relevant to an organization is deemed essential for both management as well as employees. Such information is found valuable and can be used as the basis for decision making. A Portal is a website that acts as an intermediary gateway to a variety of information made available on other sites [1]. An organization should take advantage of portals to assist them in the delivery of information in accordance to an their needs and designated authorities. Furthermore, portals are found useful in organizations because it carries the inherent characteristics of an information gateway which is user-centered and community-based, and provides a variety of services to the community [2].

Ideally every employee in an organization should capitalize on portals' capabilities to support their work activities. However portals adoptions in many cases are found to be very low. It is now more than ever important to fully be aware of the factors that affect portal's adoption.

As part of the efforts to augment knowledge concerning portal adoption, it has become the agenda of many researchers. For example, Sumak et al. evaluated a Moodle-based e-learning portal using Unified Theory of Acceptance and Use of Technology (UTAUT) as the basis for assessment

[3]. Additionally, Yahya et al. explored how e-government portals are adopted in Malaysia [4]. Other researches such as [5, 6] combined known theories such as UTAUT and Task-Technology Fit (TTF) model to understand the way portals are adopted in the public sector. Chomcholao and Naenna analyzed portals by intertwining theories of IS success models to technology adoption [7]. Neill and Richard incorporated a modified Technology Acceptance Model (TAM) theories to evaluate individual's acceptance towards intranet portals [8].

This research distinguishes itself from the previous by emphasizing on user's intentions in using portals. This study investigated a very specific research question, namely "what are the factors that affect users intention towards portals usage?" The purpose of this research was to determine the antecedents of users' intention towards portal utilisation, and consequently make recommendations on efforts to increase it.

2. THEORETICAL OVERVIEW AND HYPOTHESES DEVELOPMENT

This research adopted theories from DeLone and McLean Information Systems Success Model [9], UTAUT [10], TAM [11], as well as several previous researches to build the underlying research model.



The portal itself is defined as a gateway to a variety of other information systems that provides organizational information as well as those related to individual employees [12]. Generally, portals can be seen as a gateway not only to various websites, but also to other sources of information connected to a network. In other words, portals offer a centralized access towards numerous relevant contents and applications.

TAM is a model used to analyze and comprehend the factors that affects acceptance level of technology. TAM was first introduced by Davis in 1989 [11]. The UTAUT Model was developed by Venkatesh et al. In 2003. This particular model tested the factors that affects user acceptance, and user behaviours in using technology [10]. An interactive model proposed by DeLone and McLean depicts the concepts and the operations of a successful information systems implementation [9]. All three models aforementioned have been used widely in a variety of research.

Impacts of Information Quality on Perceived Ease of Use and Perceived Usefulness

One factor that may affect the utilization of an information system, according to the Information Systems Success Model of DeLone and McLean is information quality. The quality of information portrayed on a portal can be evaluated from the information presented. Information quality can be identified from several characteristics, such as accuracy, currency, completeness, relevance, and consistency [9]. Information quality presented on the portal, either in the form of news, organizational or personal data, can affect user's perception of ease of use as well as usefulness. This is supported by research conducted by Chomchalao and Naennapada in 2013 [7]. Based on the discussion above, the authors set forth the following hypotheses:

H1: Information quality has positive effect on perceived ease of use.

H2: Information Quality has a positive effect on perceived usefulness.

Impacts of System Quality on Perceived Ease of Use and Perceived Usefulness

Systems quality is another factor that may affect the use of an information system [9]. Systems quality is defined as the system's level of efficiency in generating and delivering information and services to users [7]. The quality of the system can be identified through adaptability, availability, reliability, response time, usability [9], privacy, and security [13]. System's quality is argued to have

affects on user's perception of ease of use and usefulness [7]. Such arguments led the authors to the next hypotheses:

H3: System Quality has positive effect on perceived ease of use.

H4: System Quality has a positive effect on *perceived usefulness*.

Impacts of Service Quality on Perceived Ease of Use and Perceived Usefulness

Information system usage is also affected by service quality [9]. Service quality reflects all the support provided by a system's manager on the services provided. The service quality of a portal may affect user's perception towards the portal's ease of use and usefulness. Quality of service can be viewed from several features such as presence, reliability, assurance, empathy, and responsiveness [9]. The authors then drew the hypotheses as follows:

H5: Service Quality has positive effect on perceived ease of use.

H6: Service Quality has positive effect on *perceived usefulness*.

Impacts of Facilitating Condition on Perceived Ease of Use

The UTAUT model explains that the acceptance of an information system is affected by facilitating conditions. Facilitating condition is defined as the level of users' confidence towards organizational and technical infrastructure to support the system's utilization [10]. Within the working environment, any facilities provided by the organization are considered as a factor that may affect users' utilization of a portal. Facilitating condition is typically viewed from the manifestations of resources, knowledge, and compatibility with other systems, help, and guidance [10]. The authors then hypothesized:

H7: *Facilitating condition* has positive effect on perceived ease of use.

Impacts of Social Influence on Perceived Usefulness

In addition, the UTAUT model also stated that the acceptance of information system is affected by social influence. Social influence is defined as the level of an individual user's perception on another's recognition to feel important in using the system [10]. In the context of this research, such notion is exemplified when co-workers influence each other on their intention to use the portal. Social influence can be identified through subjective norms, social

factors, and image .The authors then derived the next hypotheses:

H8: Social influence has positive influence on *perceived usefulness*.

Impacts of Job Relevance on Perceived Usefulness

The TAM model explains that job relevance play a significant role in determining technology acceptance. Job relevance is defined as an individual’s belief that the system can be used to support their daily work activities [14]. Portals which are highly relevant to an individual’s work will increase their interests in utilization. Job relevance is viewed from aspects such as the level of interest, relevance, and linkages with daily work tasks [14]. The authors then hypothesized the following:

H9: Job relevance has positive influence perceived usefulness

Impacts of Perceived Ease of Use on Perceived Usefulness and Intention to Use

Perceived ease of use also affects the acceptance of an information system. Perceived ease of use is identified as an individual’s beliefs that the use of information technology aids them and releases them of cumbersome efforts [11]. A portal perceived as easy to use increases users beliefs on usability as well as their interest in using it. Perceived ease of use is viewed in terms of convenience, controllable, clear and understandable, flexible, easy to become proficient, and easy to use [11]. The authors then

hypothesized:

H10: Perceived ease of use has positive effect on *perceived usefulness*.

H11: Perceived ease of use has positive effect on *intention to use*.

Impacts of Perceived Usefulness on Intention to Use Portal

Finally, TAM also explains that the use of an information system is affected by perceived usefulness. Perceived usefulness is an individual’s belief that using a system will improve the performance of carrying out daily work activities [11]. A portal which the users perceive to be useful increases their intention to use. Perceived usefulness can be evaluated from several criterias, such as the faster work performance, productivity increase, work effectiveness, ease of work, and usefulness [11].

Intention to use the portal can be defined as an individual’s conscious decision to perform or not to perform an activity in the future. It is typically evaluated from the intention, prediction, and plans to use the system within a certain period of time [15].

Based on the discussion above, the authors derived to the final hypotheses in this research:

H 12: Perceived usefulness has positive influence on intention to use the portal.

To ease comprehension, the authors have illustrated all the hypotheses drawn in Figure 1.

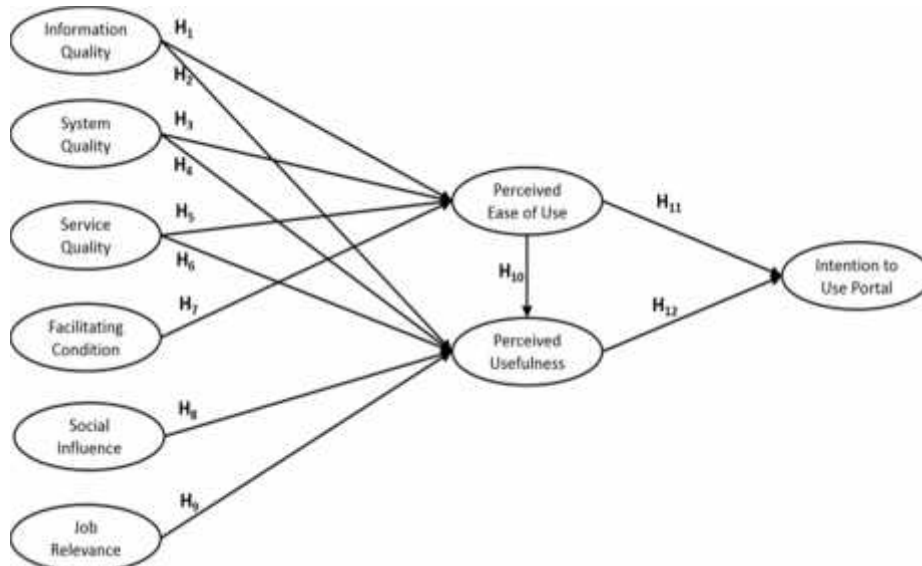


Figure 1: Underlying Research Model



3. RESEARCH METHODS

3.1. Research Approach

The research approach used is quantitative approach, with a case study method. Questionnaires were distributed as a method for data collection. Research model, indicators and questions were developed based on those defined by previous literatures, and was translated to Bahasa Indonesia language to fit the local context.

This research is an empirical study research with a case study in an Indonesian state-owned enterprise that exhaustively uses portals. The portal itself fulfills critical portal characteristics, such as community based [2], acts as an entry point to various information [12], and provides unique contents and self services [1].

Data gathered were evaluated using PLS-SEM analysis method. SmartPLS 2.0 was the tool of choice for data analysis. The data analysis process follows the steps in PLS which consists of evaluation of the outer model followed by the evaluation of the inner model where the hypothesis is tested using a re-sampling method through bootstrapping.

3.2. Instrument Design

Data in this research was obtained by distributing questionnaires. The proposed questions were derived from previous theories, and used a 5 point Likert scale for quantitative analysis. This study encompassed nine latent variables that consisted of six exogenous variables and three endogenous variables. The indicators used in this study amounted to 41. A pilot study was also conducted prior to the distribution of questionnaires to ensure every question was interpreted correctly by the respondents.

3.3. Research Population and Sample

The research population was all 1180 active portal users in the organization. In total, 200 questionnaires were returned and evaluated for validity and completeness. The questionnaire itself was distributed online, by placing a link in the organization's portal during a two months period from December 2014 to January 2015. This research used all 200 valid responses as sample.

4. RESEARCH RESULTS

4.1. Respondents Demography

The demographics of this research's respondents are presented in Table 1.

Table :1 Respondents Demography

Demographic Aspect	Details	Percentage
Gender	Male	84.50%
	Female	15.50%
Computing Efficacy	Adept	30.50%
	Intermediate	59.00%
	Basic	10.50%
Visits to Portal (per month)	< 5 times	27.00%
	5 to 10 times	32.00%
	10 to 15 times	12.00%
	15 to 20 times	11.00%
	20 to 25 times	8.50%
	More than 25	9.50%

4.2. Outer Model Evaluation

Validity Test

Data processing on SmartPLS 2.0 M3 includes an evaluation of the measurement model and the structural model evaluation. This step was intended to measure the relationship between every indicator and its latent variable. The validity and reliability of indicators are the main goal from this evaluation.

Testing begins with a loading factor test. Indicators with loading factor values of less than 0.7 were removed, namely; FC1, FC2, FC3, SI1, and SI5. Once removed, researchers recalculated the remaining indicators' loading factor values. The results of the second stage loading factor values all exceeded 0.7 and are summarized in Table 2.

Table 2: Loading Factor Values

Indicator	Value	Indicator	Value
FC4	0.9224	PU1	0.9054
FC5	0.9389	PU2	0.9426
IQ1	0.7341	PU3	0.9204
IQ2	0.8000	PU4	0.9345
IQ3	0.7000	PU5	0.9448
IQ4	0.7546	SI2	0.7981
IQ5	0.7773	SI3	0.9143
IU1	0.9358	SI4	0.8657
IU2	0.9541	SeQ1	0.8649
IU3	0.9576	SeQ2	0.9201
JR1	0.8986	SeQ3	0.8036



Indicator	Value	Indicator	Value
JR2	0.9501	SeQ4	0.8999
JR3	0.9427	SeQ5	0.8791
PE1	0.8511	SyQ1	0.7643
PE2	0.8646	SyQ2	0.7573
PE3	0.8021	SyQ3	0.7426
PE4	0.7375	SyQ4	0.7894
PE5	0.8466	SyQ5	0.8025

Consecutively, this research went on to testing the value of Average Variance Extracted (AVE) and Communality of each latent variable. The value of AVE greater than 0.5 indicates that the indicator meets convergent requirement to measure related constructs. Table 3 shows that all indicators had values of AVE and Communality greater than 0.5

Table 3: AVE and Communality Values

Latent Variables	AVE	Communality	Root of AVE
FC	0.8661	0.8661	0.930644938
IQ	0.5685	0.5685	0.75398939
IU	0.9009	0.9009	0.949157521
JR	0.8663	0.8663	0.930752384
PE	0.6752	0.6752	0.821705543
PU	0.8642	0.8642	0.92962358
SI	0.7408	0.7408	0.860697392
SEQ	0.7646	0.7646	0.87441409
SYQ	0.5952	0.5952	0.771492061

Furthermore, this research continued by comparing the values of the root of AVE with its latent variable correlation values. Root of AVE values can be seen in Table 3 and the correlation values of every latent variables are elaborated in Table 4. Each latent variable had root of AVE values greater than the values of the latent variable correlations.

An indicator is considered to be valid if it has the highest loading factor to the addressing construct when compared to loading factors to other constructs. Cross loading is one of the methods in measuring discriminant validity [16, 17]. In this

Table 4: Correlation Value Latent Variables

	FC	IQ	IU	JR	PE	PU	SI	SEQ	SYQ
FC	1	0	0	0	0	0	0	0	0
IQ	0.4576	1	0	0	0	0	0	0	0
IU	0.1362	0.191	1	0	0	0	0	0	0
JR	0.3427	0.3097	0.2334	1	0	0	0	0	0
PE	0.5321	0.4863	0.3706	0.4454	1	0	0	0	0
PU	0.4337	0.3800	0.3921	0.7031	0.5405	1	0	0	0
SI	0.3113	0.3390	0.4754	0.5167	0.4548	0.5362	1	0	0
SEQ	0.6881	0.5361	0.0473	0.2500	0.3678	0.3002	0.2292	1	0
SYQ	0.4899	0.5940	0.1999	0.3307	0.4579	0.3853	0.4416	0.5931	1

research, the highest loading factor value of all indicators belonged to the addressing constructs and had values of greater than 0.7 only on the variables measured.

Reliability Test

An outer model is said to be reliable if it has composite reliability value (CR) is greater than 0.7. The reliability test can be strengthened by measuring the Cronbach's alpha value with results greater than 0.7 [18]. The results of Cronbach's Alpha and Composite Reliability tests can be seen in Table 5. The results in this research showed that every variable had both Cronbach's Alpha and Composite Reliability values of greater than 0.7 elucidating the outer model to be a reliable one.

Table 5: Cronbach's Alpha and Composite Reliability Values

Latent Variables	Cronbach's Alpha	Composite Reliability
FC	0.8459	0.9282
IQ	0.8102	0.8680
IU	0.9450	0.9646
JR	0.9226	0.9511
PE	0.8787	0.9120
PU	0.9607	0.9695
SI	0.8232	0.8953
SEQ	0.9228	0.9419
SYQ	0.8302	0.8802

4.3. Inner Model Evaluation

The evaluation of the structural model includes testing the value of the coefficient of determination (R²) path coefficients, and T-statistics.

R Square Results

The inner model is evaluated by using coefficient of determination (R²) reflecting the model's goodness-fit [19, 20]. Table 6 presents the (R²) test results. (R²) was tested on dependent variables to measure the variation in changes



brought about by independent variables.

Intention to use (IU) was affected by perceived ease of use and perceived usefulness by as much as 18.93%. Whereas perceived ease of use was affected by its variables by 38.79%, and perceived usefulness was affected by its variables by 58.09%.

Table 6: Coefficient of Determination (R^2) Values

Endogenous Latent Variables	(R^2) Value
IU	0.1893
PE	0.3879
PU	0.5809

Outer Weight & Path Coefficient

Path coefficient values and T-statistics values were tested on each path to test the significance of the path in the structural model.

The outer weight test was conducted to identify each indicator’s significance to its latent variable. It meets the significant criteria if its t-statistic is greater than 1.96 [19, 20]. In this research, five paths had t-statistic values of less than 1.96, which led the author to reject its respective hypotheses. Table 7 lists the values of path coefficients, T-statistics, and hypotheses decisions.

Table 7 Path Coefficient and T-statistics Values

Hypo-thesis	Paths	Path coefficient	T-statistics	Decision
H 1	IQ → PE	0.2733	2.3272	Accepted
H 2	IQ → PU	0.0496	0.4468	Rejected
H 3	SYQ → PE	0.1962	1.8262	Accepted
H 4	SYQ → PU	0.0075	0.0819	Rejected
H 5	SEQ → PE	- 0.2070	1.3163	Rejected
H 6	SEQ → PU	0.0315	0.3386	Rejected
H 7	FC → PE	0.4533	4.3993	Accepted
H 8	SI → PU	0.1536	1.7771	Accepted
H 9	JR → PU	0.5063	4.8149	Accepted
H 10	PE → PU	0.2059	2.3873	Accepted
H 11	PE → IU	0.2242	1.4753	Rejected
H 12	PU → IU	0.2709	2.4148	Accepted

5. DISCUSSION AND IMPLICATIONS

Looking at the results of this research, the intention to use portals was significantly found to have direct influence from perceived usefulness. Perceived usefulness was significantly found to have direct influence from social influence, job relevance, and perceived ease of use. On the other hand, perceived ease of use was only significantly found to have direct influence from information quality, system quality, and facilitating conditions.

This study also proved that an exogenous latent variable that had the strongest influence on portal’s adoption was job relevance. This is revealed by the path coefficient value of the belonging to job relevance to be greater than those of other exogenous latent variables. Thus, this research has revealed that the utmost important factor that affects users’ intention to using portals is the relevance of such portal to users’ jobs. In other words, users will be more interested in using portals that are highly pertinent to their work, such as those that provides various kinds of work-relevant information. According to TTF, information technology carries positive impacts to users if such technology is deemed useful with the individual’s daily tasks and work activities [21].

Service quality did not significantly influence perceived ease of use and perceived usefulness, rendering it insignificant towards user’s intention in using portals. One logical explanation for this notion is perhaps users will be persistent in using portals despite inadequate services available, given the portals facilitate their work.

Intention to using portals can be increased by ways of improving information quality, system quality, facilitating conditions, social influence, and job relevance. For example, improving information quality can be achieved by presenting accurate, current, complete, relevant, and consistent information. Additionally, improving system quality of the can be realized by ensuring the system’s availability and reliability, increasing its response time, and better ensure the overall system privacy and security. Furthermore, improving facilitating conditions can be attained by providing assistance and a thorough usage guidance. Social influence can be improved by clearly exhibiting management’s and immediate supervisor’s support as well as deploying a company-wide policy towards the use of the portal. Finally, increasing job relevance can be conducted by providing a variety of features that may help users finish their work more effectively.

User’s intention to use portals was influenced by a variety of things outside the variables examined in this study. It was shown from the values of the coefficient of determination (R^2) in variables such as intention to use, perceived ease of use, and perceived usefulness.

6. CONCLUDING REMARKS

6.1. Conclusion

This research specifically aims to explore the determinants of users’ intention to using a portal.



The conclusions, being provisionally supported by data in this study, are given as follows:

The intention to using portals was positively influenced by perceived usefulness. Whereas perceived usefulness was positively influenced by perceived ease of use, social influence, and job relevance. Perceived ease of use was positively influenced by information quality, system quality, and facilitating condition.

Information quality, system quality and service quality were deemed irrelevant towards perceived usefulness. Additionally, service quality was considered irrelevant towards perceived ease of use.

6.2. Future Works

This research has shown the determinants that affect users' intentions to using portals, however there are other factors that were not included in this study that may also affect the intention to use portals. The authors aspire and invite other researchers to further explore such determinants, with a more holistic perspective that can be gathered by constantly adapting the unique conditions of different case studies. It is the authors' aims to be able to obtain more generalized results and complete information of such concurring conditions.

7. REFERENCES

- [1] D. Chaffey, *E-Business & E-Commerce Management : Strategy, Implementation, and Practices*, England: Prentice Hall, 2011.
- [2] S. Kaur dan M. S. Baba, "Development of a Networking Education Portal for Secondary Education Communities in Malaysia," dalam *International Conference on Computing & Informatics*, Kuala Lumpur, 2006.
- [3] B. Sumak, G. Polancic dan M. Hericko, "An Empirical Study Of Virtual Learning Environment Adoption Using UTAUT," *Second International Conference on Mobile, Hybrid, and On-Line Learning*, pp. 17-22, 2010.
- [4] M. Yahya, F. Nadzar dan B. A. Rahman, "Examining User Acceptance of E-Syariah Portal Among Syariah Users in Malaysia," *Procedia - Social and Behavioral Sciences*, vol. 67, pp. 349-359, 2012.
- [5] Y. Andriariza, *Penerimaan Portal Pemerintahan Menggunakan UTAUT dan TTF: Studi Kasus Intra Kominfo di Kementerian Komunikasi dan Informatika*, Jakarta: MTI UI, 2013.
- [6] T. Hendrawati, *Analisis Penerimaan Sistem Informasi Integrated Library System (INLIS): Studi Kasus Perpustakaan Nasional RI*, Jakarta: MTI UI, 2013.
- [7] S. Chomcholao dan T. Naenna, "Influence of System Traits and Personal Traits on the Acceptance of e-Government Service," *Information Technology Journal*, vol. 12, no. 5, pp. 880-893, 2013.
- [8] W. D. Neill dan J. E. Richard, "Intranet Portals Marketing and Managing Individuals Acceptance and Use," *Australian Marketing Journal*, vol. 20, pp. 147-157, 2012.
- [9] V. Venkatesh, M. G. Morris, G. B. Davis dan F. D. Davis, "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly*, vol. 27, no. 3, pp. 425-478, 2003.
- [10] V. Venkatesh dan H. Bala, "Advancing the Technology Acceptance Model: a Research Agenda Focused on Interventions," *Information Technology Research Institute*, pp. 1-55, 2008.
- [11] A. Tatnall, *Web Portals: The New Gateways to Internet Information and Services*, London: Idea Group Publishing, 2005.
- [12] B. Pérez-Mira, *Validity of DeLone and McLean's Model of Information Systems at the Website Level of Analysis*, Louisiana: Louisiana State University, 2010.
- [13] J. C. Nunnally dan I. H. Bernstein, *Psychometric theory*, New York: McGraw-Hill, 1994.
- [14] P. B. Lowry dan J. Gaskin, "Partial least squares (PLS) Structural Equation Modeling (SEM) for Building and Testing Behavioral Causal Theory: When to Choose It and How to Use It," *IEEE Transactions on Professional Communication*, vol. 57, no. 2, pp. 123-146, 2014.
- [15] H. Jogiyanto, *Konsep dan Aplikasi Structural Equation Modeling Berbasis*



- Varian dalam Penelitian Bisnis, Yogyakarta: UPP STIM YKPN, 2011.
- [16] J. F. Hair, G. T. M. Hult, C. M. Ringle dan M. Sarstedt, A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), Thousand Oaks: Sage, 2013.
- [17] D. Goodhue dan R. Thomson, "Task - Technology Fit and Individual Performance," *MIS Quarterly*, pp. 213-236, 1995.
- [18] I. Ghazali dan H. Latan, Partial Least Squares : Konsep, Teknik dan Aplikasi Menggunakan Program SmartPLS 2.0 M3, Semarang: Badan Penerbit Universitas Diponegoro, 2012.
- [19] W. DeLone dan E. McLean, "The DeLone and McLean Model of Information Success : A Ten-Year Update," *Journal of the Management Information Systems*, vol. 19, no. 4, pp. 9-30, 2003.
- [20] F. D. Davis, R. P. Bagozzi dan P. R. Warshaw, "User Acceptance of Computer Technology: A Comparison of Two Theoretical Model," *Management Science*, pp. 982-1003, 1989.
- [21] F. D. Davis, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, vol. 13, no. 3, pp. 319-340, 1989.