

UDC 37.07

ANALYSIS OF E-LIB USAGE THROUGH TECHNOLOGICAL SYSTEMS

Hendrawan Muhammad Rosyihan*, Alfajri Taufiq Akbar, Andarwulan Trisna

University of Brawijaya, Indonesia

*E-mail: mrhendrawan@ub.ac.id

ABSTRACT

The library in university is required to provide the best service to support the quality of the academic community. Therefore, they provide not only digital collections but also other information materials. The originality that offered in this research is there is still a rare research about Technology Accreditation Model (TAM) in E-libraries at state university libraries in Indonesia. The data collection technique used is a survey with questionnaires. This research uses accidental sampling in collecting data from 150 respondents who are study in sarjana programs of 5 selected State Universities in Malang, Indonesia. The variables of this study consisted of 3 variables; they are perception of usability, perception of ease and attitude of user. The linear multiple regression analysis technique is used as data analysis technique in this research. The hypothesis in this research was analyzed partially with the t-test and simultaneously with the F-test. The results indicate that the utility perception variable positively influences the attitude of user in the E-Library System in the State University Libraries in Malang, Indonesia.

KEY WORDS

E-library, technological system, technology acceptance model, academic library.

Technology has become one of the inseparable elements in human life even become a lifestyle. This lifestyle is called e-life (Wardiana, 2013). Since so many people undergo an e-life, it's no wonder there will still be an increase in the number of internet users in the world. In 2014, internet users were still at 2.95 billion people, but in 2018 it is predicted that there will be an increase into 3.82 billion people (E-marketer, 2016). The calculation shows that almost half of the population in the world has used the internet in their lives. In addition, libraries, especially university libraries, are now experiencing gradual changes from conventional libraries to e-libraries which become a platform for users to communicate, to implement e-learning and e-research (Hong et al, 2013).

The university library is required to provide their best service to support the quality of the academic community. Therefore, they provide not only digital collections but also other information materials, which are one of the parts of the E-Library area that lately tends to be applied to college library institutions. Data and information are the basic needs of users and the progress of civilization when people are able to apply the right information at the right time (Fox and Marchionini, 2012). With the emergence of E-Library now, almost all public and private tertiary libraries have wide and integrated access. The standard features of the university E-Library are institutional profiles, up-to-date information about that library and also search facilities with Online Public Access Catalog (OPAC). In the E-library, well-known universities libraries are also provide journals and subscribed electronic books. The problem that arises is whether the E-Library owned by the universsity is accepted and used well by the academic community. In order to find out the actual use of the E-Library the researchers chose 5 State University Libraries in Malang City Indonesia, they are the University of Brawijaya Library, Malang State University Library, Islamic State of Maulana Malik Ibrahim Library, Malang State Polytechnic Library and Health Polytechnic of the Ministry of Health of the Republic of Indonesia Malang Library.

The originality that offered in this research is the research on Technology Accuracy Model (TAM) on E-libraries in higher education libraries in Indonesia is still rare. This research is expected to fill the empirical void so it can strengthen TAM's theory in research field of E-Library. This study aims to determine the effect of perceived usefulness on the

attitude of use about E-Library System in the State University Libraries in Malang City. On the other side, the researchers want to know the effect of perceived ease of use on attitude to use of the E-Library System in the State University Libraries in Malang City, Indonesia.

LITERATURE REVIEW

The emergence of the E-Library started in the mid-1990s. Its development in recent years has opened up new horizons in a wide range of problems related to the design, implementation, development and evaluation of the E-Library itself. E-Library has been defined in various ways and views. Witten et al. (2009) defines E-Library as an organization that provides resources, including special staff, structure selection, offers intellectual access, interprets, distributes, preserves integrity, and ensures persistence from time to time from information and collections digital works so that it is available for use by the community or community. The above definition involves 3 key components, which are fundamental E-Library theoretical frameworks, namely People or people, information resources, and Technology. Arms (2015) provides an informal definition of E-Library, a collection of information managed by integrated services where information is stored in digital format and can be accessed through the network. An important part of this definition is that information is managed. The same variety of data, when organized systematically, becomes an E-Library collection.

Referring to various definitions that stated before, it can be seen that in the field of E-Library, computers and networks are very important and fundamental. The true picture of E-Library is the interaction between people, organizations, and technology. E-Library technology is often determined and continues to be developed, but the way and how technology. The benefits of e-library as a new service in the library for the user community is that the E-library is a service that can help with integrated learning initiatives

Technology Acceptance Model (TAM) is a theory that is widely used in the field of information systems (Hong, et al, 2013), e-commerce (Koufaris, 2002), and other information technology fields, especially the attitude of using information systems and their use (Davis, 1989; Davis et al, 1989). TAM was developed from the Theory of Reasoned Action (TRA) concept which describes a person's behavior based on their goals. TRA is a model theory that examines human behavior developed by Fishbein and Ajzen (1975).

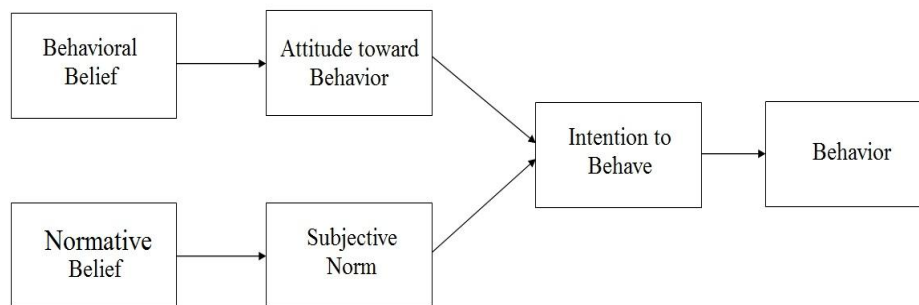


Figure 1 – Theory of Reasoned Action (Fishbein and Ajzen, 1975)

TRA is a model that adopted by Davis (1989) to develop the TAM model. The development of TRA made TAM implies that a person's perceptions and reactions to something will determine the attitude and behavior of that person. In this study one's perceptions and reactions to the E-Library System of the State University Library in Malang City will influence the attitude of using technology. Factors that can influence this are user perceptions of the usability and ease of use of technology. Technology Acceptance Model (TAM) was developed by Davis (1989). TAM has been used extensively to help understand and explain the attitude of use in the field of technology and information systems. TAM emphasizes the two most influential indicators in his theory, namely perceived of usefulness and perceived of ease to use.

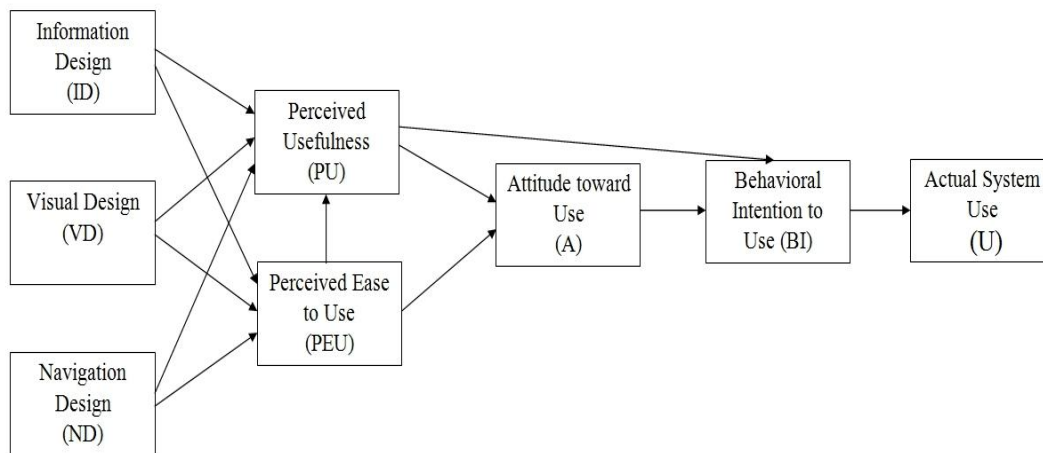


Figure 2 – Technology Acceptance Model (Davis, 1989)

TAM has been widely used in electronic service research (Lee et al, 2003; Amberg, 2004; Pagani, 2004) found significant results on perceived of usefulness and perceived ease of use. Likewise with the results of research from Pederson (2003) which showed significant results between attitude toward use of perceived of usefulness and perceived ease of use in research on electronic service with simplified TAM.

Perceived Usefulness is the level where a person believes that by using a particular system, his/her work will be easier (Davis, 1989). A system is built with the aim to facilitate human work so that humans can work more effectively. Just as an E-Library Library system is built so library users can find collections they need more easily. In TAM, perceived usefulness is closely related to the attitude toward the use and behavioral intention of use (Davis, et al., 1989). Usability perceptions are closely related to attitudes and intentions of use because however the user evaluates, be they positive or negative judgments, if the user believes that the system he uses will help carry out his work, then the system will continue to be used.

Perceived Ease to Use is the level at where a person believes that by using a particular system, his/her work will be effortless (Davis, 1989: 320). What is meant by being effortless here is being able to do the work without requiring hard work and experiencing unnecessary difficulties. Just as an E-Library is built so that users can find out more information without having to come to a particular agency or organization that requires time and effort. Attitude Toward Use (attitude of use) is defined as a positive or negative attitude in performing an action (Davis, et al., 1989: 984), in other words the attitude toward use is the behavior / assessment of a user on a system. Attitude toward use is determined by a combination of perceived use and perceived ease of use. The use perception is formulated to have a positive relationship to the user's behavior towards the system, as well as the perception of the ease of the user having a positive relationship to the user's behavior towards the system.

Hypotheses. Venkatesh (2003) stated that perceptions of use were able to improve user performance in the implementation of the E-Library system. According to Isaac (2008: 89) the benefits of implementing an information system one of which is to provide benefits to users.

The ease of using a particular system when accessing something that can facilitate work becomes the hope of each individual, one of them is the use of TAM-based E-Library (Chuttur 2009: 5). Sembada (2012) found that ease of perception has a significant positive effect on the attitude of using a library information system, this means that the ease of the system can influence the increase in their attitude. Based on the literature review described above, the hypothesis proposed:

H₁: Perception of usability has a significant positive effect on the attitude of using the E-Library System based on Technology Acceptance Model (TAM) in State University Libraries in Malang, Indonesia.

H₂: Perception of Ease has a significant positive effect on the attitude of using the E-Library System based on Technology Acceptance Model (TAM) in State University Libraries in Malang City, Indonesia.

METHODS OF RESEARCH

This research uses a quantitative approach with the explanatory research to confirm the truth of the hypothesis proposed. The survey technique in the form of a questionnaire was conducted to obtain primary data. The questionnaire uses 5 Likert Scale to make sure the data is more accurate. The focus on this study is the use of E-Library. The scope of this study includes the attitude of use (perceived to use), perceived usefulness and perceived ease of use of the E-Library in the Library of State Universities in Malang City, Indonesia. The population in this study is all active undergraduate program users of E-Library at 5 State Universities in Malang City of Indonesia in 2014. The sample in this study was undergraduate program students using E-Library taken from each of the 1 Faculty at 5 State Universities in Malang, Indonesia. The sampling method in this study uses a purposive sampling method by taking samples according to certain criteria, namely undergraduate programs in 2014 from each of the 1 Faculty in 5 State Universities in Malang City that have used the E-Library system from their College Library. The respondents used in this study was 150 respondents onden. Determination of the number of samples using the formula Roscoe (1975) which states that for samples with homogeneous criteria can be determined by the number of variables multiplied by 10. Variables of this study consisted of 3 variables, namely perception of usability, perception of ease and attitude of use.

This research is emphasized on one aspect, the user which can be seen from the attitude of them (attitude to use). In order to predict attitude to use, TAM has two variables which are the main determinants of perceived usefulness and perceived of ease (Davis, 1989). This study uses independent variables and dependent variables (bound) as shown in Table 1 below:

Table 1 – Research variabel and Indicator

Numb.	Variable	Indicator	Source
1	Perception of use(X1)	Speed up work (X1.1)	Davis (1989:331)
		Improved Performance (X1.2)	
		Increase Productivity (X1.3)	
		Effective (X1.4)	
		Simplify work (X1.5)	
		Helpful (X1.6)	
2	Perception of ease (X2)	Easy to learn (X2.1)	Davis (1989: 331)
		Easy to Control (X2.2)	
		Clear and easy to understand (X2.3)	
		Flexible (X2.4)	
		Easy to become proficient (X2.5)	
		Easy to use (X2.6)	
3	Attitude of use (Y)	Experience with the E-Library system (Y1)	Davis, et al. (1989: 984)
		Attitude of acceptance to the system E-Library (Y2)	
		Attitude of rejection of the system E-Library (Y3)	

The linear multiple regression analysis technique is a data analysis technique in this research. The hypothesis in this research was analyzed partially using the t test and simultaneously using the F test. Data validation was used before conducting multiple linear regression analysis to make it easier to calculate using SPSS for Windows Version 21. The test used to find out the questionnaire used in this research accurate and feasible to analyze, then a pilot test was conducted to test the questionnaire used. The instrument testing technique used was the validity test and reliability test. Normality test, multicollinearity test, heterocedasticity test became the classic assumption tool used in this research.

RESULTS AND DISCUSSION

Descriptions of respondents were obtained based on the results of questionnaires distributed to 150 respondents categorized according to the demographic characteristics of the respondents in this study, so that a general description of respondents taking the 7-9 semester was the highest at 57%, that followed by students in semester 4-6 by 19% and semester students 1-3 by 17%. While judging by age, respondents aged 21-23 years dominated with a percentage of 61%. The age of 18-20 years is the second largest respondent, while respondents aged over 24 are at the lowest position of 5%. Based on gender, there is a more general picture of female respondents than male respondents with a percentage of 81% and 19%.

Multiple linear analysis is done by using t test and F test. Its function is to test the effect or linear relationship of independent variables (X1 and X2) with the dependent variable (Y). The basis of decision making from the t test is if the sig value is <0.05 or t count> t table then there is an effect of variable X on Y. Conversely, if the value of sig> 0.05 or t counts <t table then there is no effect of variable X on variable Y. T table is obtained by formula:

$$T \text{ table} = t (\alpha/2 : n-k-1) = 1.976$$

The result of multiple linear analysis can be seen in Table 2.

Table 2 – Multiple Linear Analysis result

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	4.029	.956		4.213	.000
1 Perception of Use (X1)	.174	.048	.332	3.622	.000
Convenience Perception (X2)	.159	.050	.292	3.182	.002

Source: Researchers Processed Data, 2018.

Based on the table, the following multiple linear regression equations are obtained:

$$Y = \alpha + \beta_1 (X1) + \beta_2 (X2)$$

$$Y = 4.029 + 0.174 (X1) + 0.159 (X2)$$

Where: Y = Attitude of Use; X1 = Perception of Use; X2 = Convenience Perception.

Based on the multiple linear regression analysis, it can be seen that the significance value at X1 is 0.00 which is less than 0.05 and the value of t count is 3.622 which is greater than t table 1.976. These results indicate that the perception of usability (X1) has a positive effect on attitude of use (Y) so that it can be concluded that the first hypothesis (H1) is accepted. The significance value at X2 is 0.02 which is less than 0.05 and the value of t count is 3.182 which is greater than t table 1.976. These results indicate that the perception of ease (X2) has a positive effect on attitude of use (Y) so it can be concluded that the second hypothesis (H2) is accepted. This finding is confirmed by research conducted by Lee et al. (2003); Amberg (2004); Pagani (2004); Pederson (2003) who showed significant results between attitude toward use of perceived of usefulness and perceived ease of use in research on electronic service with simplified TAM. Effect of perceived usefulness (X1) and perception convenience (X2) simultaneously or together towards the attitude of use (Y) is known through the F test. Significance values do not exceed 0.05 and F count is greater than F table. F table is obtained by formula:

$$F \text{ table} = F (k : n-k) = 3.06$$

These results are presented in the form of Table 3.

Table 3 – F test Result

	Model	Sum of Squares	Df	MeanSquare	F	Sig.
1	Regression	158.093	2	79.046	35.439	.000 ^b
	Residual	327.880	147	2.230		
	Total	485.973	149			

Source: Processed Data, 2018.

Based on the F test performed, it is known that the significance value for the effect of X1 and X2 simultaneously on Y is $0.000 < 0.05$. F value calculated $35.439 > F$ table 3.06, so it can be concluded that perceptions of usability and perceived ease of influence influence the attitude of usage simultaneously. The interpretation of the results of the correlation coefficient and test coefficient of determination states that the value of the coefficient of determination Adjusted R Square (R²) is amounting to 0.316. This shows that 31.6% of the attitude of using E-Library in the Library of State Universities in Malang is influenced by variables of usability and convenience, while the remaining 68.2% is influenced by other variables outside the independent variables used in this study.

CONCLUSION

Based on the research finding and discussion on the Analysis of the Usage of E-Library with the Simplification of Technology Acceptance Model (Study toward visitor of E-Library System of State University Libraries in Malang City), conclusions can be drawn that the perception of use variable significantly has a positive effect on attitude towards the E-Library system in 5 state university libraries in Malang, Indonesia. The perception of ease variable significantly has a positive effect on the attitude of use in the E-Library System in 5 state university libraries in Malang, Indonesia. Variable perceptions of use and perceived ease together can increase the positive attitude of users of the E-Library System users in 5 state university libraries in Malang, Indonesia.

REFERENCES

- Arms, William Y. (2013). Digital Library. USA: The MIT Press.
- Amberg, M., Hirschmeier, M., & Wehrmann, J. (2004). The Compass Acceptance Model for the Analysis and Evaluation of Mobile Services. *International Journal of Mobile Communications*, 2(3), 248-259.
- Chuttur, M.Y. (2009). Overview of the technology acceptance system : Origin developments and future directions. Indiana University, USA sprouts: Working paper on information systems, 9(37).
- Davis, F.D., (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 73(3), 319-340.
- Davis, F.D., Bagozzi, R.P., Warshaw, P.R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35 (8), 982-1003.
- E-marketer. (2016). Slowing Growth Ahead for Worldwide Internet Audience. Retrieved from <http://www.emarketer.com/Article/Slowing-Growth-Ahead-Worldwide-Internet-Audience/1014045>, on March 10th, 2018.
- Fishbein, M., Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Fox, E. A. & Marchionini, G. (1998). Toward a worldwide digital library. In *Communications of the ACM*, Vol. 41 No. 4, pp. 29-32.
- Hong, W., Thong, J., Wong, W-M., & Tam, K-Y. (2013). Determinants Of User Acceptance Of Digital Libraries: An Empirical Examination Of Individual Differences And System Characteristics. *Journal of Management Information Systems*, Vol. 18, No. 3, Pp. 97–124.

10. Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behavior. *Information Systems Research*, 13, 2, 205–223.
11. Lee, W.J., Kim, T.U., Chung, J. (2002). *User Acceptance of the Mobile Internet*. Athens, Greece: M-Business.
12. Nov, O. & Ye, C. (2008). Users' Personality And Perceived Ease Of Use Of Digital Libraries: The Case For Resistance To Change, *Journal Of The American Society For Information Science And Technology*, 59(5), pp. 845–851.
13. Pagani, M. (2004). Determinants of Adoption of Third Generation Mobile Multimedia Services. *Journal of Interactive Marketing*, 18(3), 46-59.
14. Pederson, E. (2003). Adoption of Mobile Internet Services: An Exploratory Study of Mobile Commerce Early Adopters. *Journal of Organizational Computing and Electronic Commerce*, 15(3), 203-222.
15. Roscoe, J. T. (1975). *Fundamental Research Statistics for the Behavioral Sciences*. USA: Holt, Rinehart and Winston.
16. Sembada, Deo Agung (2012). *Evaluasi Penggunaan Content Management System (CMS) untuk Sistem Informasi Perpustakaan dengan Technology Acceptance Model (TAM): Studi kasus Perpustakaan Emil Salim*. Skripsi Program Studi Ilmu Perpustakaan and Informasi, Fakultas Ilmu Pengetahuan Budaya, Universitas Indonesia, Jakarta. Retrieved from <http://lontar.ui.ac.id/file?file=digital/20312823-S%2043165-Evaluasi%20penggunaan-full%20text.pdf> on March 9th, 2018.
17. Tabassum, M., Roknuzamman, M., & Islam, M. (2015). Usage of Digital Library system at a private university library in Bangladesh. *Annals of Library and Information System*, Vol. 62, 94-103.
18. 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.
19. Wardiana, W. (2013). *Perkembangan Teknologi Informasi di Indonesia*. Proceeding Paper, Seminar and Pameran Teknologi Informasi. Bandung: FT-UNIKOM.
20. Witten, Ian H., Bainbridge, David & Nichols, David M. (2009). *How to Build a Digital Library*. USA: Morgan Kaufmann.