

## **Analysis of Usage, Satisfaction and Utilization of e-Ticketing PT Kereta Api (KAI) with Delone McLean Model**

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**Abstract:** PT Kereta Api Indonesia (KAI) e-Ticketing system has been running, since, 2012 but there are still some obstacles experienced by users. Therefore, an analysis of the success rate of using e-Ticketing is needed. Quantitative research uses the success model of information technology systems from Delone McLean. The data in this study are primary. Questionnaires were given to 381 passengers using the e-Ticketing system. Data were analyzed using the Structural Equation Model (SEM) method using the SmartPls 2 application. Analysis conclude that this model can be used to predict satisfaction, use and benefits of PT KAI e-Ticketing. The factors that influence satisfaction are information quality, system quality, service quality, use and net benefits. Net benefits with satisfaction have a reciprocal relationship. The factors that influence usage are quality, information and net benefits. Net benefits with the use of having a reciprocal relationship.

**Key words:** Delone McLean, success model, use, satisfaction, e-Ticketing, SEM, net benefits

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### **INTRODUCTION**

The internet has changed all processes and ways of business, including one of them is the way consumers buy goods and services. Consumer aspects in company analysis are very fundamental. Consumer aspects are included in the 5 strengths in Porter's analysis, so that, it includes having a strong bargain position. Because of this, companies need to change the value chain. The business strategy must be adjusted to the changing conditions of consumer, so that, the company needs service innovation. The impact of service innovation is the achievement of sustainable business operations. Service innovation affects the value chain a very good value chain influences financial performance, both short and long term. The impact of good financial performance, will be achieved by a sustainable business operation.

The role of information technology is very important. When divided into the role of technology in the management structure, technology can be for lower, middle and upper level managers. Technology for lower-level managers has more to do with operational and technical factors. Technology can improve operational efficiency and effectiveness that have an impact on improving the quality of products and services (Gallaughar, 2007). Information technology can also become a bridge and communicate between consumers and producers to improve customer relationship.

Information technology also plays a role in business processes and operations, decision making and strategies for increasing competitive advantage. While at the level of top-level managers, information technology plays a role in formulating broad-based strategies such as business intelligence.

PT Kereta Api Indonesia (KAI) is a state-owned company (state-owned enterprise) engaged in transportation. Since, 2008 internet and smartphone usage in Indonesia has experienced a significant increase, this prompted PT KAI in 2012 to create a web-based ticketing system, so that, consumers do not need to order conventional tickets at the ticket counter. PT KAI has switched from product oriented to customer oriented. According to the Ministry of Communication and Information in 2013 smartphone users in Indonesia amounted to 50 million. users, this prompted PT KAI to make a special application for the e-Ticketing mobile version. Finally in 2014 PT KAI issued a special application for train e-Ticketing named KAI Access that based on Android or iOS. The system is directly integrated with various banks and minimarkets. The e-Ticketing system can minimize costs and maximize efficiency and effectiveness (Anonymous, 2016 a-c).

Researchers chose e-Ticketing as a topic research because train users are very numerous, according to PT KAI's report/month, train users reach 30 million. This e-Ticketing system is still new, so, there are still

many weakness. The simplify and benefits offered by e-Ticketing force consumers to switch from conventional reservation systems to online-based systems. The acceptance and use of e-Ticketing is currently high. According to the research conducted by Dilla and Setiawan (2014), e-Ticketing is an application that is easy to use and useful so users are positive when using it. Although acceptances and usage of e-Ticketing are high there are still weaknesses in PT KAI's e-Ticketing.

Researchers want to know the extent of success and the use of e-Ticketing. This is very important because almost 60% of information technology projects fail it can be due to technical or non-technical problems. Non-technical factors are influenced by many aspects of users, this research focuses on non-technical factors, namely aspects of users.

The success and usefulness of information technology can be measured through an evaluation based on a research model. The focus of this research is the success of STI (e-Ticketing) and its impact on improving customer service. Measurement of the success and/or usefulness of information technology is important, so that, it can understand the value of information system management activities and information system investments.

## MATERIALS AND METHODS

**Model of success of information technology (IS Success Model):** DeLone and McLean (1992) made a research model to determine the success of information technology. The success model of Delone McLean information technology can be used as a guideline for creating information technology systems in organizations (Jugiyanto, 2000 a, b). From 1992-2000 the role of Information Technology (IT) changed and experienced with significant progress. Likewise many researchers are measuring the success and usefulness of IT. The measurement model has experienced a lot of development. Seddon (1997) argue that the lack of Delone McLean Model is that the Delone McLean Model has a mixture of process aspects and variant aspects. Process aspects and variant aspects have different concepts and cannot be mixed.

Based on these criticisms and the changing role of information technology, DeLone and McLean (2003) created a new information technology research model, found in Fig. 1.

**Model development:** In the Delone McLean information technology success research model there are intention to use and use variables. Both of these variables are

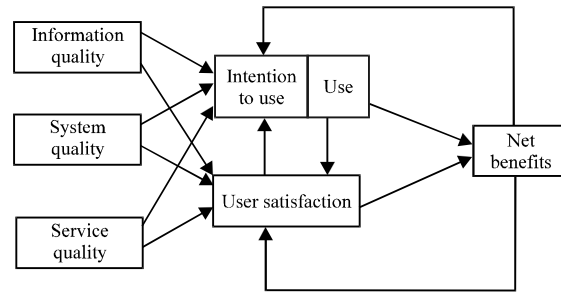


Fig. 1: Delone McLean information system success model (2003)

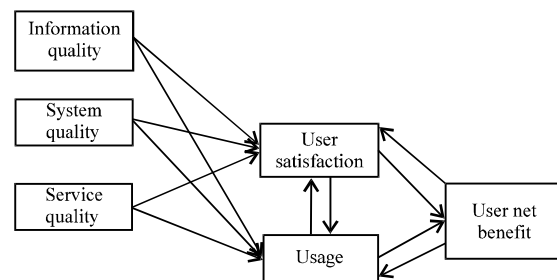


Fig. 2: Research model

optional and alternative (Delone and McLean, 2003). The researcher does not use the variable intention to use because e-Ticketing is voluntary. Many studies only use variables. According to Khayun *et al.* (2012), intention to use is an aspect of attitude while use is an aspect of actual behavior or actual usage. Measuring an attitude is difficult because it is closely related to behavior/behavior, so that, many researchers only use the use variable in their research. So, the measurement model that will be in this study is as follows (Fig. 2).

## Hypothesis

**Information quality:** Buyers hope to get enough information before they buy products and services. When information is irrelevant, outdated and inaccurate it will reduce the use because the buyer information needs are not found. Aspects of information quality are accurate, complete, relevant, easy to understand and provide security to consumers when transacting online (DeLone and McLean, 2003).

Poor information quality will result in information asymmetry between producers and consumers. Information asymmetry causes consumers to spend more energy and costs to get information that is not obtained, it will reduce satisfaction. Jung *et al.* (2009) conducted research on mobile TV consumers from the results of research found that poor information quality will reduce consumer satisfaction.

- H<sub>1a</sub>: information quality has a positive influence on satisfaction
- H<sub>1b</sub>: information quality has a positive effect on use

**Quality system:** System quality is described through aspects of ease, availability, ability to adapt and speed of response (DeLone and McLean, 2003). System quality is closely related to technical aspects in a system such as easy to use, response speed, reliability and availability (Khayun *et al.*, 2012). Poor system quality causes difficulties for consumers to use this will make consumers dissatisfied:

- H<sub>2a</sub>: system quality has a positive influence on satisfaction
- H<sub>2b</sub>: system quality has a positive effect on use

**Service quality:** Pitt *et al.* (1995) argue that the quality of service aspects is important for measuring the effectiveness of Information Systems (SI). Services that meet consumer expectations will cause satisfaction. Satisfaction is formed because what the consumer wants is fulfilled by the seller. Low seller response will also make dissatisfaction in consumers. Service quality can improve consumer satisfaction in mobile ticketing:

- H<sub>3a</sub>: service quality has a positive influence on satisfaction
- H<sub>3b</sub>: service quality has a positive effect on use

**Usage and user satisfaction:** According to Jugiyanto (2008a, b), usage includes aspects of consumers visiting a web/application to retrieving information and executing transactions on the web. Satisfaction is the cumulative feeling that consumers have from the results of interacting with service providers (Oliver, 1980). Consumers will not use a system again if they do not feel satisfaction. Liu *et al.* (2010) found that satisfaction is a strong determinant of consumer behavior. So that, usage and satisfaction have reciprocal relationships:

- H<sub>4a</sub>: use has a positive influence on satisfaction
- H<sub>4b</sub>: satisfaction has a positive effect on use

**Benefits for users:** According to Petter *et al.*, the net benefits are the contribution of information systems to the success of individuals, groups, organizations, industries and countries. According to Jugiyanto (2008a, b) the size of net benefit success is organized based on levels, there are levels of individuals, groups, organizations, industries

and countries. Satisfaction and use of e-Ticketing will improve net benefit e-Ticketing. Satisfaction and use have a reciprocal relationship with net benefits:

- H<sub>5a</sub>: satisfaction has a positive influence on net benefits
- H<sub>5b</sub>: usage has a positive effect on net benefits
- H<sub>6a</sub>: net benefit has a positive effect on satisfaction
- H<sub>6b</sub>: net benefit has a positive effect on usage

The population in this study is consumers of PT. KAI has ever booked tickets online. The method is convenience sampling. The number of population in this study cannot be known with certainty, there are not many requirements/criteria in the sample chosen, so that, the researcher uses the method. The sample criteria in this study are as follows:

- Respondents have booked tickets online more than once
- Respondents are adults (17+)

**Method of collecting data:** This research method is quantitative. Variable measurement data was obtained from respondent's answers measured by 1-5 Likert scale. The distribution of questionnaires was carried out in a paper based and online survey through social media (WhatsApp, Line, Facebook and path). List of questionnaire questions was adopted from previous studies. The source of data in this study is primary data. Primary data in the form of answers from KAI consumers through questionnaires.

## RESULTS AND DISCUSSION

**Validity test:** Based on the results of validity testing as shown all indicators have met the test criteria for convergent validity because all AVE and communality are more than 0.5 (Table 1).

**Reliability test:** Based on the reliability test results, the composite reliability values of each construct above 0.7 and Cronbach alpha above 0.6, so that, it can be said that the measuring indicators used in this study are reliable (Table 2).

**Menilai inner model/model struktural:** Use has a R<sup>2</sup> value of 0.5146. This means that the variables of information quality, system quality, service quality, satisfaction, net benefits can explain the variation in changes in usage variables by 51.46% (Table 3).

Satisfaction has a  $R^2$  value of 0.6061. This means that the quality of information, system quality, service quality, net benefits and usage can explain variations in changes in satisfaction variables by 60.61%.

Net benefit has a  $R^2$  value of 0.6062. This means that the use and satisfaction variables can explain variations in net benefit variable changes of 60.62%.

The coefficient value of the path or inner model shows the level of significance in hypothesis testing (Jogiyanto and Abdillah, 2009). The results of data processing with Smart PLS are presented in Table 4.

Based on the beta value of the coefficient and t-statistic value, the test results in this study can be summarized as follows (Table 5).

**Hypothesis 1:** The test results found that the quality of information has a positive and significant effect on user satisfaction in purchasing tickets online. The results of this study are in accordance with the results of

Table 1: Communality and ave

Variables	AVE	Communality
Satisfaction	0.743757	0.743757
Information quality	0.622910	0.622910
Service quality	0.664740	0.664740
System quality	0.556490	0.556490
Net benefit	0.718406	0.718406
Usage	0.835110	0.835110

Table 2: Composite reliability and Cronbach alpha

Construct	Composite reliability	Cronbach's alpha
Satisfaction	0.935413	0.913439
Information quality	0.891335	0.846164
Service quality	0.886502	0.824581
System quality	0.896865	0.864407
Net benefit	0.927258	0.901857
Usage	0.938221	0.901001

Table 3: Nilai  $R^2$ 

Construct	$R^2$
Usage	0.514617
Satisfaction	0.606144
Net benefit	0.606179

Table 4: Model inner results

Ku	Original sample (O)	Sample Mean (M)	SD (STDEV)	SE (STERR)	t-statistics ( O/STERR )
Information quality -> satisfaction	0.246492	0.248032	0.052773	0.052773	3.219
Information quality -> usage	0.240527	0.236960	0.070172	0.070172	2.621
Service quality -> satisfaction	0.115321	0.114836	0.038934	0.038934	2.655
Service quality -> usage	0.023617	0.030121	0.040635	0.040635	0.484
System quality -> satisfaction	0.392702	0.389865	0.064889	0.064889	4.347
System quality -> usage	0.049927	-0.052022	0.057938	0.057938	0.744
Satisfaction-> netbenefit	0.629647	0.628432	0.036000	0.036000	14.267
Usage -> satisfaction	0.192798	0.186968	0.073767	0.073767	2.271
Satisfaction -> usage	0.075361	0.078583	0.089468	0.089468	0.794
Netbenefit -> satisfaction	0.456693	0.457567	0.068004	0.068004	6.489
Netbenefit -> usage	0.267453	0.265104	0.079993	0.079993	3.559
Usage-> net. benefit	0.245343	0.239057	0.053821	0.053821	4.018

Significant (t count>1.64); t-table is determined to be significant at alpha 0.05 (t-count is more than t-table 1.64)

the research by Delone and McLean (2003) which states that the quality of information describes the contents of e-Ticketing applications/websites. Information quality has a positive and significant effect on consumer's use in purchasing tickets online. The results of the study are consistent with the results of Jung *et al.* (2009) which states that poor information quality will reduce consumer satisfaction, so that, the quality of information is in line with customer satisfaction.

**Hypothesis 2:** System quality has a positive and significant effect on user satisfaction. Bauer *et al.* (2006) found that the quality of the system positively affects customer satisfaction because the quality of the system is closely related to customer satisfaction. The quality of the system has no effect on use. System quality is related to the technical aspects of a system such as ease of use, response time, reliability and availability. In the context of KAI e-Ticketing because the system contained in e-Ticketing is not too complicated, the results of the research show that the quality of the system does not affect the use.

**Hypothesis 3:** The test results found that service quality has a positive and significant effect on user satisfaction in purchasing tickets online. In other fields, service quality has been investigated to increase consumer satisfaction in mobile ticketing. Service quality has no effect on use in purchasing tickets online. This is not in accordance with the results of research by Delone and McLean (2003). The services provided show the seller's sensitivity and ability to serve consumers. So that, in the context of PT KAI's e-Ticketing the quality of service has little impact on usage.

**Hypothesis 4:** Use (use) has a positive influence on satisfaction (user satisfaction) but satisfaction does not affect the use. This shows that KAI consumers who use e-Ticketing as a whole have been satisfied after using KAI's e-Ticketing but the satisfaction is not a factor that encourages KAI consumers to use e-Ticketing. This

Table 5: Summary of hypothesis test

Hypothesis	Results
H <sub>1a</sub> ) Quality of information on satisfaction	Supported
H <sub>1b</sub> ) Quality of information on usage	Supported
H <sub>2a</sub> ) Quality of the system to satisfaction	Supported
H <sub>2b</sub> ) Quality of the system against use	Not supported
H <sub>3a</sub> ) Quality of service to satisfaction	Supported
H <sub>3b</sub> ) Quality of service to use	Not supported
H <sub>4a</sub> ) Use of satisfaction	Supported
H <sub>4b</sub> ) Satisfaction with use	Not supported
H <sub>5a</sub> ) Net benefit satisfaction	Supported
H <sub>5b</sub> ) Use of net benefits	Supported
H <sub>6a</sub> ) Net benefits for satisfaction	Supported
H <sub>6b</sub> ) Net benefits for usage	Supported

happened because satisfied or unsatisfied, KAI consumers will continue to use KAI's e-Ticketing instead of buying tickets at the station counter. So, it can be concluded that use and satisfaction do not have reciprocal relationships.

**Hypothesis 5 and 6:** Test results show that user satisfaction has a positive influence on user net benefits and user net benefits also have a positive effect on satisfaction. This shows that satisfaction is a benefit obtained by KAI e-Ticketing users, these benefits then become factors that influence satisfaction. So, it can be concluded that satisfaction and net benefits have reciprocal relationships.

Test results show that use has a positive effect on net benefits and net benefits also have a positive effect on usage. This shows that the use of KAI e-Ticketing provides a benefit for KAI e-Ticketing users, these benefits then become the factors that influence reuse. So, it can be concluded that the use and net benefits have a reciprocal relationship.

## CONCLUSION

The results of  $R^2$  measurement and hypothesis testing have succeeded in measuring/predicting satisfaction, PT KAI's use and net benefit e-Ticketing even though there are unsupported hypotheses. The factors that influence satisfaction are information quality, system quality, service quality, use and net benefits. Net benefits for satisfaction relate reciprocally. The factors that influence use are information quality and net benefits. Net benefits with the use of having a reciprocal relationship.

## SUGGESTIONS

Based on samples, research methods and research results, the researchers suggest the following for further research. Due to resource constraints, the sample in this study is not very varied in terms of age and the majority

is distributed to objects that live in large cities. So that, for further research it can be done in various cities and varies between big cities and small cities because now a days even in small towns there are so, many people who use smartphones. The sample in this study is an average of 23-38 years old.

## RECOMMENDATION

Therefore, for further research considers age distribution, so that, the spread of age is more evenly distributed, from young to elderly. Researchers can combine the Delone McLean Model with other measurement models.

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