Design of Reliability Applications Online Transportation in the Medan City Community with Perspective as Users

Budi Anshari Nasution[1] Rahima Br. Purba[1], Iskandar Muda[2]
[1]*Student Postgraduate, Faculty Economic and Business, Universitas Sumatera Utara, Medan Indonesia*
[2]*Lecture Faculty Economic and Business, Universitas Sumatera Utara, Medan Indonesia*

Keywords: Information Technology, Information Systems, Behavior Aspects.

Abstract: Along with the development of information technology, growing developers who try to provide applications that can provide ease in meeting the needs of convenient transportation, comfortable and affordable prices. Information System Success Model using the Delone and MacLane Model can be used to see the reliability and success of online transport applications. The unsuccessful hypothesis proposed proves that other determinants become factors that affect the reliability and success of its particular information system online transport even if the model used has been valid. Lack of some respondents in this study is suspected to cause the research data obtained is not sufficient for decision making in the hypothesis. Aspects of Behavior (Behavior Aspects) both users and applications are presumed also influence the intensity of use (Intent to use) and user satisfaction (User Satisfaction).

1 INTRODUCTION

The complexity of human needs causes a change in society. This paper is shown in the rapid development of information technology. Information technology itself can be described as a technology that combines computer networks with lines of communication that carry data, voice or video. One form of application of visible information technology development is in the transport sector. Along with the development of information technology, growing developers who try to provide applications that can provide ease in meeting the needs of convenient transportation, comfortable and affordable prices. Especially in the city of Medan which has a level of congestion that has increased throughout the years.

Table 1: Number of registered motor vehicles (Units) 2009 – 2013

Years	Cars	Bus	Pickup	MotoCycle
2009	297.922	29.498	194.946	3.091.510
2010	327.467	29.978	203.452	3.478.230
2011	356.931	71.112	217.254	3.924.007
2012*)	386.144	71.590	231.750	4.292.933
2013	416.405	71.900	242.445	4.584.431

Sources: Polda North Sumatera Direktorat Lalu Lintas Province North Sumatera.

The number of vehicles each year is increasing, visible from the data above. The increase in the number of vehicles is not balanced with the city's highway capacity. According to data from the Department of Transportation of Medan City (2016), the number of motor vehicles reaches 2.7 million units with a length of 3,191.5 km and a speed ratio of 23.4 km / h and a Capacity Ratio of 0.76. Private vehicle 97.8%, general vehicle 2.2%, two-wheel vehicles 75.95%, and four-wheel 24.05 %. This condition that led to the creation of applications to facilitate the search for means of transportation.

Various applications appear to solve the problem. The claim that appeared in 2010 is Gojek, in 2012 is Grab. And in the Year 2017 is Uber. Each transport application implements a different tariff system. It also offers ease of payment, i.e., in cash, auto debit and wallet balance like Go-pay and Grab-pay.

These applications offer new things in the means of transportation in Medan City. The higher the sophistication of technology, the higher the problem can be caused by the technology itself. The success of an information system can be explained from various things, including quality system, the quality of information provided, and user satisfaction using the information system.

Nasution, B., Purba, R. and Muda, I.
Design of Reliability Applications Online Transportation in the Medan City Community with Perspective as Users.
DOI: 10.5220/0010067409510956
In *Proceedings of the International Conference of Science, Technology, Engineering, Environmental and Ramification Researches (ICOSTEERR 2018) - Research in Industry 4.0*, pages 951-956
ISBN: 978-989-758-449-7

In analyzing the determinants of reliability in the online transport applications used by drivers, this study used the Delone & Mclean model. The Delone & Mclean model reflects the dependence of the six measurements of information system success. The six elements are: (1) Information quality, (2) System Quality, (3) Service Quality, (4) Intention To Use, (5) User Satisfaction, and (6) Net Benefits (Delone and Mclean, 2003).

2 LITERATURE REVIEW

This Information data processed into a useful form for the wearer receives the data source as input and processes it into information product as output. The information system consists of several sub-systems or components of hardware, software, and brainware, as well as procedures for running inputs, processes, outputs, storage, and controls that transform data sources into information (8). Information systems can also be interpreted as a system in an organization that brings daily transaction processing needs that support organizational operational functions that are managerial with the strategic activities of an organization to be able to provide to certain parties with information needed to make decisions.

Uber Technologies Inc. is an American multinational company engaged in the field of online transportation services. This company is a developer with the name of Uber application. This application provides transportation on demand facility. This application has a function as an intermediary between the driver and the consumer who need transportation means this application is available in the Google Store, Apps Store and Microsoft. So that consumer of this uber is party that use smartphone. From the driver side, this application makes it easy for drivers to use private vehicles, so they are not tied to any party (Rosyadi, 2017), (Utomo, *et al*. 2017).

Grab is a transport company by using mobile device taxi online application to make a booking passenger shuttle from the place that has been determined user and delivered in accordance with the purpose of the order on the application. This app is also controlled with GPS as a tool map (Utomo, *et al*. 2017), (Chan, *et al.* 2017).

Go-Jek is also a transportation service company using applications that make it easier for people in transportation services (Chan, *et al*. 2017). Various choices of these applications make their existence increasingly coloring the universe of online transportation services competition, in this competition conditions these three companies seeks in improving service facilities to customers.

The Delone and McClean Information Model Success Model is a model that illustrates how far the contribution of a product generated by an information system to an organization (Delone and Mclean, 2003).

The success of the online transport company is seen through the performance of its employees. If the employees are good then it will affect the company profit. Performance optimization requires a motivation in the employees. Basically, both the same reward and punishment are needed to stimulate someone to improve their quality. Reward is raised to motivate a person to be active in carrying out responsibilities because there is the assumption that by giving rewards for the results of his work, employees will be more work maximally[5]. While punishment is raised for a person who commits mistakes and offenses to be motivated to stop deviant behavior and lead to positive behavior (Tarigan *et al.* 2018)

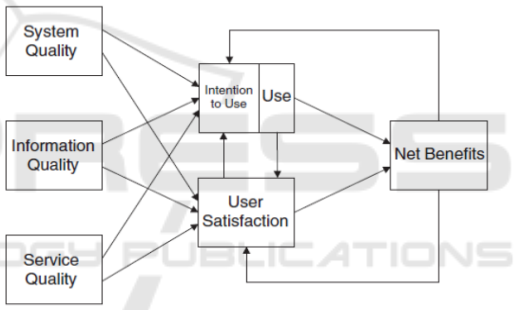

Figure 1. DeLone and McLean Model of Information System Success (Delone and Mclean, 2003)

3 METHOD OF RESEARCH

This study was designed using quantitative research. [9] Quantitative analysis is research whose data are expressed in numbers and analyzed by statistical techniques. The research is often in the form of experiments and surveys. This research was conducted in Medan City with a schedule of questionnaire distribution from May 14, 2018, until June 02, 2018. The type of research data used is primary data. Primary data is data obtained by researchers by way of spreading form to respondents and interviews with some respondents who met to be backup data. Primary data in this study include the results of filling the questionnaire distributed to the respondents.

Population in this research is all user driver of transportation application (go-jek, Uber, and Grab). The sample of this study is the user drivers of transport applications (go-jek, Uber, and Grab) which fill out the questionnaire dated May 14, 2018, to June 02, 2018. Data collection using survey methods conducted online.

4 RESULT AND ANALYSIS

4.1 Testing Validitas

Table 2: Value Average Variance Extranced.

	Average Variance Extracted (AVE)
IN_X4	0,638
IQ_X1	0,636
IU_Z1	0,564
NB_Y	0,622
SQ_X3	0,565
SYQ_X2	0,592
US_Z2	0,650

From the output of the analysis can be seen that the Average Variance Extraced (AVE) value above 0.50. This means it qualifies for validity.

4.2 Testing Reliabilitas

Table 3: Cronbach's Alpha.

	Cronbach's Alpha
IN_X4	0,813
IQ_X1	0,936
IU_Z1	0,692
NB_Y	0,916
SQ_X3	0,887
SYQ_X2	0,868
US_Z2	0,921

From the results of the analysis output can be seen that the value of Cronbach's Alpha above 0.60. This means qualifying reliability.

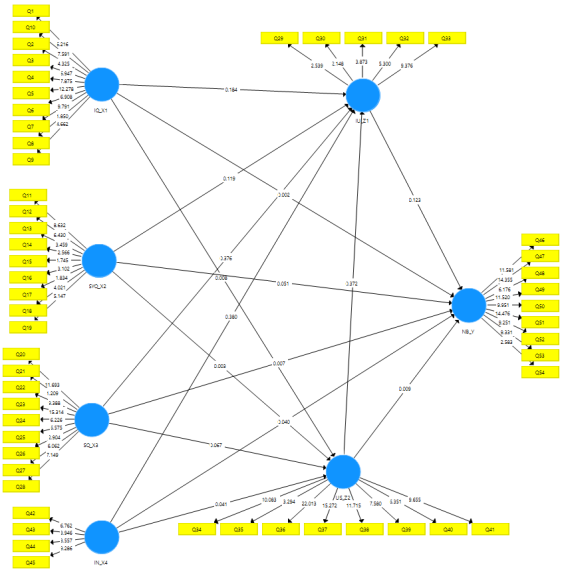

Figure 2. Structure Path Coefficient Values.

From the result of the path coefficient above can be seen that all variables did not affect the value of t-statistics generated for all variables <1.96. This means that all alternative hypotheses are rejected

1. Influence of Information Quality on Intention of use
   From the table above we can see that the impact of Information Quality on Intention of use has an at-statistic value of 0.184 and p-value value of 0.854. Because the amount of t <1.96 then Information Quality does not affect the Intention of Use.
2. Influence of Information Quality to User Satisfaction
   From the above table, the impact of Information Quality on User Satisfaction has a t-statistic value of 0.008 and p-value of 0.993. Because the amount of t <1.96 then Information Quality does not affect User Satisfaction.
3. Effect of System Quality on Intention of use
   From the table above the impact of System Quality on Intention of Use has a t-statistic value of 0.119 and p-value value of 0.905. Because the amount of t <1.96 then the System quality does not affect the Intention of Use
4. Effect of System Quality on User Satisfaction
   From the table above the influence of System quality on User, Satisfaction has a t-statistic value of 0.003 and p-value value of 0.997. Because the amount of t <1.96 then System Quality does not affect User Satisfaction.

5. Effect of Service Quality on Intention of use
   From the above table, the influence of Service Quality on Intention of Use has a t-statistic value of 0.376 and p-value of 0.707. Because the amount of t <1.96 then Service Quality does not affect the Intention of Use.
6. Effect of Service Quality on User Satisfaction
   From the above table, the influence of Service Quality to User Satisfaction has a t-statistic value of 0.067 and p-value value of 0.946. Because the amount of t <1.96 then Service quality does not affect User Satisfaction.
7. Effect of User Satisfaction on Intention of use
   From the table above the influence of User Satisfaction on Intention of Use has a t-statistic value of 0.372 and the value of p-value of 0.710. Because the amount of t <1.96 then the information quality does not affect the Intention of Use.
8. Effect of Incentives on Intention of use
   From the table above the influence of Incentives to the intention of Use has a t-statistic value of 0.380 and the value of p-value of 0.704. Because the amount of t <1.96 then Incentives does not affect the Intention of Use.
9. Effect of Incentives on User Satisfaction
   From the above table, the impact of incentives on User Satisfaction has a t-statistic value of 0.041 and p-value value of 0.967. Because the value of t <1.96 then Incentives no effect on User Satisfaction.
10. Impact of Intention of use on Net Benefits (Individual Impact)
    From the table above the influence of intention of use on Net Benefits (Individual Impact) hast-statistic value of 0.123 and p-value value of 0.902. Because the amount of t <1.96 the Intention of Use does not affect the Net Benefits (Individual Impact).
11. Effect of User Satisfaction on Net Benefits (Individual Impact)
    From the above table, the influence of User Satisfaction on Net Benefits (Individual Impact) has an at-statistic value of 0.009 and p-value value of 0.993. Because the amount of t <1.96 then User Satisfaction does not affect the Net Benefits (Individual Impact).

Next, we see the Indirect Effect of the variable; we can see the following table.

Table. 4: Specific Indirect Effect.

	Specific Indirect Effects
IN_X4 -> US_Z2 -> IU_Z1	0,098
IQ_X1 -> US_Z2 -> IU_Z1	0,000
SQ_X3 -> US_Z2 -> IU_Z1	0,152
SYQ_X2 -> US_Z2 -> IU_Z1	0,020
IN_X4 -> IU_Z1 -> NB_Y	0,009
IQ_X1 -> IU_Z1 -> NB_Y	0,001
SQ_X3 -> IU_Z1 -> NB_Y	0,005
SYQ_X2 -> IU_Z1 -> NB_Y	-0,003
IN_X4 -> US_Z2 -> IU_Z1 -> NB_Y	0,002
IQ_X1 -> US_Z2 -> IU_Z1 -> NB_Y	0,000
SQ_X3 -> US_Z2 -> IU_Z1 -> NB_Y	0,003
SYQ_X2 -> US_Z2 -> IU_Z1 -> NB_Y	0,000
IN_X4 -> US_Z2 -> NB_Y	0,078
IQ_X1 -> US_Z2 -> NB_Y	0,000
SQ_X3 -> US_Z2 -> NB_Y	0,121
SYQ_X2 -> US_Z2 -> NB_Y	0,016

From the table above can be concluded there is an indirect influence that is:

1. Effect of Incentives on the intention of use through User satisfaction of 0, 098 with significant 5%.
2. Effect of Information Quality on Intention of Use through User Satisfaction of 0,000 with significant 5%
3. Effect of Service Quality on Intention of Use through User Satisfaction of 0.152 with significant
4. 5%.
5. Effect of System Quality on Intention of Use through User Satisfaction of 0,020 with significant 5%.
6. Effect of Incentives on Net Benefit through Intention of Use of 0,009 with significant 5%.
7. Effect of Information Quality on Net Benefit through Intention of Use of 0.001 with solid 5%.
8. Impact of Service Quality on Net Benefit through Intention of Use of 0,005 with solid 5%.
9. Effect of System Quality on Net Benefit through Intention of Use of -0,003 with solid 5%.
10. Incentive Effect on Net Benefit through User satisfaction and intention of Use of 0,002 with solid 5%.

11. Effect of Information Quality on net benefit through User satisfaction and purpose of use of 0.000 with solid 5%.
12. The influence of Quality Services on Net benefit through User Satisfaction and plan of use is 0,003 with solid 5%.
13. Effect of System Quality on Net gain through User Satisfaction and purpose of use of 0.000 with solid 5%.
14. Incentives influence net benefit through User satisfaction of 0.078 with solid 5%.
15. Effect of Information Quality on net gain through User satisfaction of 0,000 with solid 5%.
16. Impact of Service Quality on net benefit through User satisfaction of 0.121 with solid 5%.
17. Effect of System Quality on net gain through User satisfaction of 0.016 with solid 5%.
18. Considering the result of the research, it is known that the model compiled related to Information System Success Model proposed shows that the variables used in the model are strongly categorized, but all hypotheses are not significant, this is contrary to Rosyadi research[2]. Several factors among them can cause the difference between the results of this study with previous research has not fulfilled the number of respondents who followed the survey. But interviews and open-ended questions to the respondents found that there are some indications of new findings regarding the determinants of successful online transport applications that are related to Behavior User Issues about incentives (punishment & rewards) that directly affect income that will accept by them every day. Not equal the position of application users and application providers when a dispute over incentive calculation also affects the usage level (intense to use) and even user satisfaction. Thus the reliability and success of an information system application is not only determined by the safety and success of the application itself but also influenced by behavioral factors of both application users and application providers.
19. The study also found that in general the reliability of available online transport applications for both motorcycles and cars is relatively similar and we found that more than 30% of users use more than one online transport application, indicating that other factors affect the success of the transport application system online. From the results of interviews and open questions put forward, it is known that the incentive factors affect the level of use of the applications they use. This factor becomes the driver of user behavior in using the available online transportation. On the other hand, the form of this incentive also has not satisfied the user because there are still many weaknesses of the application provider in detecting the fraud happened by the users and or other user groups such as fictitious travel order and false user. Changed incentive schemes with unscheduled also considered the user only benefits the application provider. Unequal positions at different calculations occur in the implementation of incentives affecting the drivers of online transport as users in determining which transport applications will be used. This is by the reward and punishment theory[5]

5 CONCLUSION

The conclusion of this paper described are:

a. Information System Success Model developed by Delone and Mclane can be used to see the reliability and success of online transport applications
b. The unsuccessful hypothesis proposed proves that other determinants become factors that affect the reliability and success of its particular information system online transport even if the model used has been valid.
c. Lack of some respondents in this study is suspected to cause the research data obtained is not sufficient for decision making in the hypothesis.
d. Behavior Aspects (both Behavior Aspects) both users and applications are also suspected to affect the intensity of use (Intent to use) and user satisfaction (User Satisfaction).

REFERENCES

W. H. Delone and E. R. Mclean, “The DeLone and McLean Model of Information Systems Success: A Ten-Year Update,” *J. Manag. Inf. Syst.*, vol. 19, no. 4, pp. 9–30, 2003.

M. I. Rosyadi, *Surabaya Analysis of Successfull Aplications Uber Driver User Prespective Surabaya City Community With Delone Model Approach Surabaya*. 2017.

H. Utomo, E. Muh, A. Jonemaro, and M. T. Ananta, “Perbandingan Usabilitas Aplikasi Taxi Online Android (Grab-car dan Uber) Menggunakan Unified Theory of Acceptance and Use of Technology (UTAUT),” *J. Pengemb. Teknol. Inf. dan Ilmu Komput.*

Vol., vol. 1, no. 12, pp. 1708–1717, 2017.

A. Chan, M. Maharani, and W. Tresna, "(Study on Pt . Go-Jek and Pt . Grab Indonesia Consumer in Dki Jakarta) Perbandingan Pengalaman Pengguna Pada Aplikasi Mobile Go-Jek Dan Grab (Studi Pada Konsumen Pt Go-Jek Dan Pt Grab Indonesia Di Dki Jakarta) Abstrak," vol. 2, no. 2, 2017.

J. M. Ivancevich, M. T. Matteson, and J. M. Ivancevich, *Organizational Organizational Behavior and Management Tenth Edition*. .

V. C. E. Tarigan *et al.*, "Cybercrime case on social media in Indonesia," *Int. J. Civ. Eng. Technol.*, vol. 9, no. 7, 2018.

S. Febrianti, M. Al Musadieq, A. Prasetya, F. I. Administrasi, and U. Brawijaya, "Pengaruh Reward Dan Punishment Terhadap Motivasi Kerja Serta Dampaknya Terhadap Kinerja (Studi pada Karyawan PT . Panin Bank Tbk . Area Mikro Jombang)," vol. 12, no. 1, pp. 1–9.

W. H. Delone and E. R. Mclean, "The DeLone and McLean Model of Information Systems Success," *J. Manag. Inf. Syst.*, vol. 19, no. 4, pp. 9–30, 2003.

H. Von and U. Schäffer, *GABLER EDITION WISSENSCHAFT Research in Management Accounting & Control*. .