

# Study on DAPODIK Information System: User Satisfaction as Mediation of System Quality and Information Quality on Net Benefit

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## Abstract

The purpose of this study was to describe the system quality, information quality, user satisfaction and net benefit, and analyze the influence of system quality and information quality on net benefit through user satisfaction. The number of the population in this study were 70 operators DAPODIK Information System in Public Senior High School on Malang Regency, Indonesia. The researcher uses the census technique by asking questions on the questionnaire to collect the data. This research use quantitative and explanatory approach. For descriptive and regression analysis SPSS version 20 were applied while path analysis used to test the hypothesis. Based on the research result, the conclusions were as follows: 1) ease of use, ease of learning, response time, reliability, flexible, personalizable, and security contributed on system quality. 2) completeness, presentation of information, relevance, accuracy, and timeliness contributed to information quality. 3) repeat purchase and repeat visit contributed to user satisfaction. 4) learning, decision quality, decision time, productivity, and task performance contributed to net benefit. 5) system quality does not influence toward user satisfaction, but information quality had a positive influence toward user satisfaction. 6) system quality and information quality do not influence toward net benefit. 7) user satisfaction had a positive influence toward net benefit. 8) information quality had a positive influence toward net benefit through user satisfaction. 9) the implication of this study that information system plays an important role in creating user satisfaction and net benefit.

**Keywords:** System quality, information quality, user satisfaction, net benefit

## 1. Introduction

Current information system development is one of the factors that are important for a school to compete in the education sector. The information system can improve the efficiency and effectiveness of daily academic business by business process integration in schools (Utami *et al.*, 2013). Davis (1989) defines "information system is a system that accepts data input and instructions, process data according to the instructions and release the result". Meanwhile, according to Sidhartha (1995), "the information system is a man-made system that provides an integrated set of components and manual computerized parts that aim to collect data, process data, and generate the information for user".

The system is said to be a success by DeLone and McLean (1992) supported by six variables: system quality, information quality, usage, user satisfaction, individual impact and organizational impact. DeLone and McLean (1992) explain that the system quality is the performance of the system refers to how well the capabilities of the hardware, software, policies, procedures of information systems can provide the information needs of users. The success of information systems rated from the information level of usefulness to create and present reports in decision-making (DeLone and McLean, 1992).

The development of research on the initial model in 1992, to be updated in 2003 where DeLone and McLean added variables of service quality as well as changing individual impact variables and organizational impact variables into a variable net benefit (DeLone and McLean, 2003). The quality of service (Service Quality) is a service provided by the developers of information system (DeLone and McLean, 2003). The satisfaction of the user (User Satisfaction) is a consumer response to the use of information system output (DeLone and McLean, 2003). DeLone and Mclean Models mentions that information quality, system quality, and service quality will affect the user as well as user satisfaction, furthermore influence on the net benefit (DeLone and Mclean, 2003), the next model was a direct relationship between the quality system, quality of information, and service quality toward the net benefit are adopted in the research of Stacie Petter, Delone and McLean (2008).

Theory of DeLone and Mclean be a certain because this theory is the main of management information system knowledge that was supported by other research such as Seddon and Kiew (1994), Rai *et al.*, (2002), Roldán and Leal (2003), Almutairi and Subramanian (2005), Livari (2005), Hussein *et al.*, (2005, 2006), Wu and Wang (2006), Lin *et al.*, (2006) and Sabherwal *et al.*, (2006). These researchers have done research on user satisfaction and the net benefit of an information system that are influenced by the system quality and information quality variable. The results are system quality and information quality will have an impact on user satisfaction and the net benefit of information systems.

The DAPODIK information system that used by the entire public senior high school on Malang is helpful

for schools. However, it does not mean the implementation not encounter any obstacles. In the utilizing, the user is complaining about the system which not supported import facility so that users have to enter them manually one by one, and the school Principal is not allowed to access the information by his own account. The only account accepted is the account of the school operator. The DAPODIK information systems extremely take the important role. They are teacher certification, government social assistance, and school operational support. That's why the data entries should be really appropriate and have good quality. Therefore, to find out the effectiveness and efficiency of DAPODIK information system, the influence of system quality and information quality on net benefit through user satisfaction as mediation is needed.

The previous researchers who use the model of DeLone and McLean are Hudin *et al.*, (2016) studied the accurate of successful information systems using success model of information system DeLone And Mclean result that the system quality and the information quality has a significant positive effect on user satisfaction and user satisfaction significantly positive to the net benefit of information system. While Ardianto, Y.T., (2013) investigated that directly proves Information Technology Organizations do not affect performance but is able to mediate the SCM Practice on Information Technology and Organizational Performance Practice SCM significantly affect Organizational performance . Arifin *et al.*, (2012) studied the effect of the regional financial information system quality to the satisfaction of local government officials use Model DeLone And Mclean with the findings that the quality of the information did not significantly affect the user satisfaction of information systems. There are differences in the result is the driving force for DAPODIK information systems research. The researcher adopted the DeLone and McLean model to proof system quality, information quality on the net benefit of DAPODIK information systems through user satisfaction as mediation.

## 2. Literature Review

### 2.1. System Quality

(DeLone and McLean, 1992) explain that the system quality is the performance of the system refers to how well the capabilities of the hardware, software, policies, procedures of information system can provide the information needs of users. According to DeLone and McLean (2003) system quality is a characteristic feature of the desired quality of the information system itself and the quality of the information desired characteristics of the product information. The same product may have the different quality assessment of each person, it causes by the different quality perception of each person, or it can be said that the quality was something relative and highly subjective. Jogiyanto (2007: 12) explains that "Quality is the system used to measure the quality of the technology system itself". That is, quality of the system is the technical quality of the information system. The system quality means the quality combination of hardware and software. Another opinion which expresses the same definition is Chen (2010: 310) that "The system quality is a measure of processing the information system itself". Based on the opinion of several experts concluded that the quality of the system is a measure of the information system itself and focused on the interaction between the user and the system. If the users of the information system feel that the system is easy to use, they do not require much effort to use them, so they will have more time to do other things that are likely to improve their overall performance (Rukmiyati and Budiarta, 2016). Description of measurement indicator variable according to DeLone and Mclean (2003) consists of (1) ease of use; (2) ease of learning; (3) response time; (4) reliability; (5) flexible; (6) personalisation; (7) security.

### 2.2. Information Quality

The quality of information is the output quality of information produced by the information system used (Rai *et al.*, 2002). Information quality is also interpreted as a measure of the information quality system application content, but the quality of the data is often used as a synonym. Negash *et al.*, (2003: 758) explain, "The quality of information is a function that concerns the value of the output information generated by the system". Furthermore, according to O'Brien (2005:5), "The information system is a combination of any manageable units of people (people), hardware (hardware), software (software), computer networks and the data communications network (communication), and databases (database ) that collect, transform and distribute information in a form of organization". Meanwhile, in the opinion of Davis (1991: 91), "the information system is a system that accepts input data and instructions, process the data in accordance with the instructions and issuing the results". Based on some experts, it can be concluded that the quality of information is a measurement that is focused on outputs produced by the system, as well as the value of output for the user. Yakub (2012) the value of the information (value of information) is determined by two things, the benefit and costs to get it. An information said to be worth more effective if its benefit compared to the cost to get it. According to Jogiyanto (2007: 15) argues that "The quality of the output of information to measure the quality of information system". Ong *et al.*, (2009: 399) argues that "Quality means quality measurement information content of the information system". Information quality refers to the output of the system information, concerning the value, benefit, relevance and urgency of the information produced (Pitt and Watson, 1997). Information of the highest quality will increase the perceived usefulness of users and improve the use of information systems (Liu and Arnett, 2000). Description of

measurement indicator variable according to DeLone and Mclean (2003) consists of (1) completeness; (2) format; (3) relevance; (4) accurate; (5) timeliness. Description of measurement indicator variable according to DeLone and Mclean (2003) consists of (1) completeness; (2) format; (3) relevance; (4) accurate; (5) timeliness. Description of measurement indicator variable according DeLone and Mclean (2003) consists of (1) completeness; (2) format; (3) relevance; (4) accurate; (5) timeliness.

### 2.3. User Satisfaction

Myers *et al.*, (1997) suggests that measuring the success of information systems is very important for the organization. The concept of information system success is a concept that is used in a variety of research as the basic criterion for evaluating information systems (Rai *et al.*, 2002). Meanwhile, Doll and Torkzadeh (1988) state “that the end-user satisfaction can be used as a measure the success of an information system”. According to Goodhue and Thompson (1995), another measurement that is associated with a major factor in measuring the success of information systems is satisfaction. Description of measurement indicator variable according to DeLone and Mclean (2003) consists of (1) repeat purchase; (2) repeat visit.

### 2.4. Net Benefit

Torkzadeh and Doll (1999), divided some the possible benefit of information system use into four different categories, namely productivity, innovation, management control, and customer satisfaction. Labor productivity can be measured by the number of tasks that can be completed and the length of time to completing the tasks. Innovation tasks can be known of how information systems help workers try innovative ideas (Almutairi and Subramanian, 2005). Customer satisfaction can be ascertained from the information system's ability to help the customer needs, improve customer satisfaction, and service to customers. The net benefit is the impact of the existence and the use of information system on the quality of the performance of both individual and organization including productivity, improving knowledge and reducing the length of time to search the information (Jogiyanto, 2007: 157). The individual impact is the effect of the existence and the use of information system on the quality of individual user performance. According to Dody and Zulaikha (2007), the individual impact is the influence of the existence and use of information systems for performance, decision-making, and the degree of individual learning within the organization. In the model of DeLone and McLean (1992) defines the impact of the individual as an indication that information system has given users a better understanding of the context of the decision, has improved the productivity of decision-making, has produced the change of user activity, or have changed the perception of decision makers on the importance or usefulness of the information system. The model also assumes that the individual impact is influenced by the use of the system and user satisfaction with the information system. According to Dody and Zulaikha (2007), The organizational impact is the effect of the existence and use of the information system on the quality of user organizational performance. It is to do with the institutions that use information systems, including productivity, efficiency, and effectiveness of the organization's performance. This organization's performance is the result of an individual performance collective. According to the model DeLone and McLean (1992), the organizational impact is influenced by the individual impact. Net benefit are benefit felt by individual in the use of the system. This individual benefit can be seen from the intensity of the system users and the satisfaction that arises from the use of the system so as to improve the individual's performance and even organizations. In this study, the net benefit is benefit perceived by individuals and organizations. Description of measurement indicator variable according to DeLone and Mclean (2003: 65) consists of (1) learning; (2) decision quality; (3) decision time; (4) productivity; (5) task performance.

## 3. Formulation and Hypotheses

### 3.1 System Quality and Information Quality have Significant Effect on User Satisfaction of DAPODIK Information Systems (H1).

In the individual research object, strong support has been found between the quality of the system toward user satisfaction of information system (livari, 2005). Some models of the information system have been researched and some researchers use the system as variable quality measurement and found a significant correlation between quality of the system toward user satisfaction (Gelderman, 2002). The system quality has a strong influence on user satisfaction (Kulkarni *et al.*, 2006; Wu and Wang, 2006; Halawi *et al.*, 2007). Another study states that the quality of the system and ease of use does not affect the user's satisfaction of information systems (Lexlecrq, 2007).

The relationship between information quality and user satisfaction is supported by several studies (livari, 2005; Wu and Wang, 2006). Study that found a consistent relationship between the quality of information and user satisfaction on the individual object (Seddon & Yip, 1992; Seddon and Kiew, 1996; Bharati, 2002; Rai *et al.*, 2002; McGill *et al.*, 2003; Almutairi and Subramanian, 2005; Wixom and Todd, 2005; Kulkarni *et al.*, 2006; Chiu *et al.*, 2007; Halawi *et al.*, 2007). Marble (2003), in his research, resulted that there is no significant

relationship between the quality of information to user satisfaction in information systems of the two organizations studied.

### *3.2 System Quality and Information Quality Have Significant Effect on Net Benefit of DAPODIK Information Systems (H2).*

The relationship between the quality of the system and the net benefit are moderated relationships in previous researches. In general, there is a significant positive effect on the individual performance, although the relationship between the ease of use information system are the indicators used in the system quality and usefulness variable the results are various. Several studies have found a significant relationship (Venkatesh and Davis, 2000; Venkatesh and Morris, 2000; Hong *et al.*, 2001; Devaraj *et al.*, 2002; Yang and Yoo, 2004; Wixom and Todd, 2005; Hsieh and Wang, 2007), the study also found no significant relationship (Chau and Hu, 2002; Kulkarni *et al.*, 2006; Wu and Wang, 2006). Seddon and Kiew (1996) and Shih (2004) found that the quality system has a significant impact on the usefulness of the information system. System reliability and ease of use of the system there is no significant effect on the productivity and effectiveness (Goodhue and Thompson, 1995). McGill and Klobas (2005) found no influence or effect on the quality of the system and individual users of information systems with decision quality and productivity measurement.

Gatian (1994) found that the quality of information has an influence on the efficiency of decision-making. On the quality of information also found a significant effect on the quality of work and time savings (D'Ambra and Rice, 2001; Shih, 2004) as well as the satisfaction of decision making (Bharati and Chaudhury, 2006). The quality of information is also effected on the usability of the system significantly (ie, a net benefit) (Kreamer *et al.*, 1993; Seddon and Kiew, 1996; Rai *et al.*, 2002; Shih, 2004; Wu and Wang, 2006). Kositanurit *et al.*, (2006) found a significant relationship between the quality of performance information in the ERP system users. However, in the context of the management system, the quality of the content of an information system are not directly related to the usefulness of information systems (Kulkarni *et al.*, 2006). The research on digital library found the relevantly of accepted information affect the usefulness of information system significantly. However, there is no usefulness relation between the user interface and the content of information system felt.

### *3.3 User Satisfaction Significantly Influence Net Benefit of DAPODIK Information System (H3).*

The results of empirical studies showed a strong relationship between user satisfaction and benefit systems (Livari, 2005). User satisfaction has been found to have a significant effect on the user's job (Yoon and Guimaraes, 1995; Guimaraes and Igbaria, 1997; Torkzadeh and Doll, 1999), to improve performance (McGill *et al.*, 2003), to increase productivity and effectiveness (Igbaria and Tan, 1997) Rai *et al.*, 2002; McGill and Klobas, 2005; Halawi *et al.*, 2007), to improve decision-making (Vlahos and Ferrat, 1995; Vlahos *et al.*, 2004), and to increase job satisfaction (Ang and Soh, 1997; Morris *et al.*, 2002). However, Yuthas and Young (1998) found that user satisfaction with the performance of decision-making is weak. A study investigating the relationship between user satisfaction and the effects on the organization, and found that satisfaction is correlated with the performance of the basic benefit level and what do users get (Gelderman, 1998). Another study examined user satisfaction to the impact of the organization's ERP system (Law and Ngai, 2007).

### *3.4 System Quality and Information Quality Have Significant Effect on Net Benefit Through User Satisfaction of DAPODIK Information System (H4).*

The quality of service, quality of information and quality of e - learning that are used, positively affect student satisfaction as a user. In addition, student satisfaction in the use of e-learning is also positively influenced the impact on individual students, namely the increase of the knowledge and productivity (Kusumawati *et al.*, 2013). Systems quality and quality of information affect the net benefit of information systems through user satisfaction (Wixom and Watson, 2001). While significant user satisfaction directly against the net benefit (Halawi *et al.*, 2007; Livari, 2005; McGill and Klobas, 2005; Vlahos *et al.*, 2004). Past research had stated that the system quality and quality of information does not affect the net benefit (Kulkarni *et al.*, 2006)

## **4. Methodology**

### *4.1. Research Design*

The quantitative approach will be used to answer the research question. Survey method used in this study. Data were collected through questionnaire. Using a Likert scale of 1-5 as an approach to Facilitate the measurement of perception. Relationship latent variables and indicators are reflective. Independent variables reflected the seven indicators of a quality system items, namely (1) ease of use; (2) ease of learning; (3) response time; (4) reliability; (5) flexible; (6) Personalisation; (7) Security, information system variables indicators reflected five items, namely (1) completeness; (2) format; (3) relevance; (4) accurate; (5) timeliness. Dependent variables user satisfaction reflected two indicators, namely (1) repeat purchase; (2) repeat visit, variables indicators reflected five items net benefit, namely (1) learning; (2) decision quality; (3) decision time; (4) productivity; (5) task



performance.

#### 4.2. Population

The population in this study is the DAPODIK operators in public senior high school on Malang Regency, Indonesia. There are 13 public senior high schools in this districts.

#### 4.3. Sampling

The population in this study is the DAPODIK operators on all public senior high school on Malang Regency Indonesia, completely 70 people. Therefore, the researcher uses the census technique by asking questions on the questionnaire to the all of the existing population of 70 people.

### 5. Result and Discussion

#### 5.1. Testing Instrument

The test results of the research instruments 70 respondents shows all items of the statement of the four studied variables declared invalid evidenced from the correlation coefficient of each item statement is greater than 0.3. Furthermore, it demonstrates the level of reliability that is well proven from Cronbach 's Alpha coefficient values greater than 0.7. Thus, the instrument can be distributed throughout the sample targets set in this study.

#### 5.2. Path Analysis

The coefficient path value of the path analysis obtained from the regression analysis which consists of three models:

- (1) The causal relationship between system quality ( $X_1$ ), information quality ( $X_2$ ), and user satisfaction ( $Y_1$ ). Regression analysis showed that the hypothesis (H1) that certify the quality system and quality of information give positive affectioned significant impact on user satisfaction is denied, seen from the path of the relationship between variables, shows that there is no causal relationship between  $X_1$  to  $Y_1$  or not significant.
- (2) The causal relationship between system quality ( $X_1$ ), information quality ( $X_2$ ) and net benefit ( $Y_2$ ). The regression analysis value shows that hypothesis (H2) that state system quality and the quality of information give positive and significant influence to the net benefit is denied because the relation of path variables show that there are no causal relation between  $X_1$  to  $Y_2$  and  $X_2$  to  $Y_2$  or not significant.
- (3) The relationship between user satisfaction ( $Y_1$ ) and net benefit ( $Y_2$ ). The result of regression analysis shows that the hypothesis (H3) explain the user satisfaction influence the net benefit significant positively are accepted, because of the path relation between variable, showed that there was a causal relation between  $Y_1$  to  $Y_2$  or significant.

After the test model described in the previous section, then the next will be the reconstruction of a causal relationship between variables paths with each other. The track construction is obtained based on the results of analysis on figure 1.

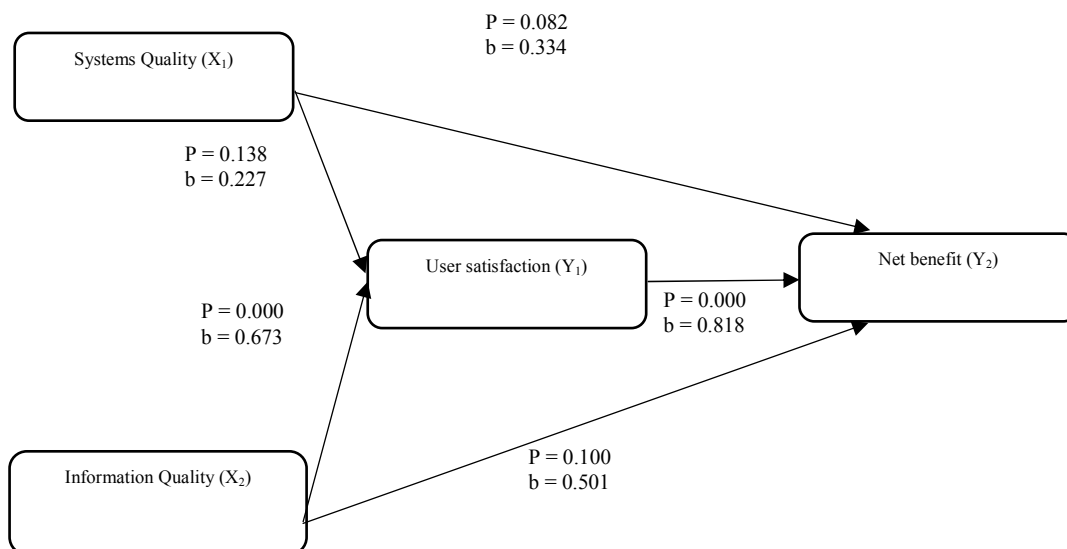


Figure 1. The Result of Path Analysis

Furthermore, to compare the direct and indirect influence of the existing path by multiplying the coefficient lines on each track is formed, the value of the highest multiplication is the best path to be used. The amount of direct and indirect influence can be calculated as follows (1) The direct effect of the quality of information ( $X_2$ )

on user satisfaction ( $Y_1$ ) with the value of path coefficient 0.673; (2) The direct effect of user satisfaction ( $Y_1$ ) to the net benefit ( $Y_2$ ) with the value of path coefficient 0.818; (3) The net total effect of the quality of information ( $X_2$ ) on the net benefit ( $Y_2$ ) through user satisfaction ( $Y_1$ ) as mediation with the value path coefficient 1.491.

### 5.3. *The influence of system quality and information quality to user satisfaction of DAPODIK information system*

The results of path analysis showed that the quality of DAPODIK information systems have no direct influence on user satisfaction significantly, while the quality of information has a direct impact on user satisfaction significantly, meaning that the higher the quality of the system will not cause the higher user satisfaction, while the higher or more low quality of information produced by the DAPODIK information system that can be accessed by the operator, has a high impact on user satisfaction.

The results are consistent with the results of Wu and Wang (2006), Halawi *et al* (2007), and Kulkarni *et al* ., (2006) that the quality of information has a positive influence and significant to user satisfaction, and in accordance with the research of Leclercq (2007) that the system quality has no significantly correlation to user satisfaction.

User satisfaction is influenced by the quality of information produced by the DAPODIK information system, which includes completeness of the generated information, the presentation of information in accordance with the needs of the school, the relevance of the information produced, accuracy of information, and timeliness of the information updates shown on the website of DAPODIK information center may help the process of fulfilling the data and information required by central government for distribution social assistance, physical and non-physical as well another allowances. So, if the quality of data and information entered into the DAPODIK information system were good, the process of disbursement of social grants and allowances associated with the data in the DAPODIK information system.

User satisfaction is not influenced by the quality of existing systems on DAPODIK information systems. This indicates that while the process of access, storage, and download the data can be done quickly but it can not make the user satisfied if data is accessed, stored and downloaded may not produce the good quality of information. So, it will have an impact on the process of receiving social grants and another allowance. Therefore, the good system quality is not necessarily to increase user satisfaction because of the good quality of the data entered and the quality of information produced by the DAPODIK information system.

### 5.4. *The influence of system quality and information quality to net benefit of DAPODIK information system*

The results of path analysis showed that the system quality and information quality of DAPODIK information system do not have a direct influence significant to net benefit, meaning that the higher the system quality and information quality will not lead to the higher net benefit obtained by the school. The results are consistent with the results Kulkarni *et al.*, (2006) that the quality of the system and the quality of information does not have a significant effect on the net benefit.

The net benefit is not affected by the system quality produced by DAPODIK information system, including ease of use, ease of the system studied, the speed of data access and information, system reliability, flexibility, and usability features that exist in the DAPODIK information system. So, if the quality of existing systems on DAPODIK information systems is higher, the benefit obtained by the individual are not the higher school as well.

The net benefit are not affected by the quality of information produced by the DAPODIK information system, which includes completeness of the generated information, the presentation of information in accordance with the needs of school, the relevance of the information produced, accuracy of information, and timeliness of information updates that appear on web pages center of DAPODIK information system. So, if the quality of the information in the DAPODIK information system is high, the benefit obtained by the individual and school are not the same.

### 5.5. *The influence of user satisfaction to net benefit of DAPODIK information system*

The results of path analysis showed that user satisfaction has a significant direct impact on the net benefit, means higher user satisfaction will lead to the higher net benefit obtained by the school. The results are consistent with the results Halawi *et al.*, (2007), Livari (2005), and McGill *et al.*, (2003) that user satisfaction has positive direct impact significantly to the net benefit. The net benefit is affected by the user satisfaction of DAPODIK information system. This case shows that by using DAPODIK information system, users are facilitated because it can be accessed anywhere through the internet connection. They can update the data real time as well as check the data. So, the users are satisfied with the DAPODIK information system. The user satisfaction affects the individual users of the system itself which leads to the school acquisition of assist through the DAPODIK information system.

### 5.6. The effect of system quality and information quality on the net benefit through user satisfaction of DAPODIK information system as mediation

The results of path analysis showed that the quality of the information has a significant indirect effect on the net benefit through user satisfaction, it means that the higher the quality of information will lead to higher user satisfaction of DAPODIK information system and lead to the higher net benefit obtained by the school.

The net benefit is affected by the quality of information through user satisfaction of DAPODIK information system, it is shown that by using DAPODIK information system users can access data and information as needed. So, user satisfaction affecting individual users of the system itself which leads to the assist acquisition by the school. Since the system can be accessed wherever the user is located so that user satisfaction increased and the benefit derived by the individual can fulfil the needs of data requested by central government through school quickly so that the school can complete the needs of data and information through DAPODIK information system that will be used as the basis for the disbursement of benefit and social assists.

## 6. Conclusion And Future Research

The result showed that the net benefit is influenced by the quality of information through user satisfaction of DAPODIK information system. It is shown that by using DAPODIK information system users can access data and information as needed for. So, user satisfaction affecting individual users of the system itself which leads to the school acquisition of assists. Since the system can be accessed wherever the user is located so that user satisfaction increased and the benefit derived by the individual can fulfill needs of data requested by central government through school quickly. The data will be used as the basis for the disbursement of benefit and social assists. The variable in this study was limited to system quality, information quality, user satisfaction and net benefit. Of course, there are many other variables that still have not been studied in the management of information systems in particular on the success of research information systems. Variables are referred are the quality of service variable, use, intense to use. Therefore, it is advisable for academics to examine and re-examine more deeply associated with this research. Thus it can provide a role for the development of science as well as strengthen and refine theories about the success of information systems.

## 7. Limitations

This research was conducted on DAPODIK information systems in the public senior high school in Malang district, but not at all high schools in Malang. The population used for DAPODIK respondents are only public schools in Malang district, both the status of respondents is a teacher or school personnel with a total population is 70 people. This study examines the system quality and quality of information on the net benefit through user satisfaction, so it's not applying an overall model of Stacie Petter, DeLone, and McLean (2008).

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