

# The effect of information quality, system quality, service quality on intention to use and user satisfaction, and their effect on net benefits primary care application at primary health facilities in Malang

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**Abstract.** The Indonesian government has serious attention to facilitate the health of its people, one of which is by establishing Badan Penyelenggara Jaminan Sosial (BPJS) hereinafter BPJS. The Government of Indonesia collaborates with several parties including primary health facilities, General and Regional Hospitals, as well as general practitioners and specialists who have been appointed by BPJS. The aim of this study is the user's perception of Primary Care applications at primary health facilities BPJS in Malang. This study uses the DeLone & McLean (D&M) Update IS Success Model to assess the success of an information system where its use is mandatory at primary health facilities. The model contains 6 dimensions that can measure the success of a system, i.e. Information Quality, System Quality, Service Quality, Use, User Satisfaction and Net Benefits. This research is a quantitative study using a questionnaire with a Likert scale. Purposive sampling is a method used in sampling. The respondents consist of doctors or admins who operate primary care applications at primary health facilities. The results of this study indicate that primary care applications can be categorized as successful information systems for each dimension of success in the D&M Update IS Success Model.

## 1. Introduction

Health is an important thing for all human beings. Maintaining health is an obligation. If the community is healthy, they can carry out activities well. The Indonesian government has a serious concern to facilitate public health, one of which is by establishing Badan Penyelenggara Jaminan Sosial (BPJS) hereinafter BPJS. Health BPJS is defined as a public body that organizes health insurance programs. BPJS Health is a relatively new public company, because it began operating on January 1, 2014. As the owner of the BPJS public organization, the Indonesian government does not work alone in organizing this health BPJS. There are classifications of several parties who collaborate with BPJS health including Primary Health Facilities, General and Regional Hospitals, as well as general practitioners and specialists who have been appointed by BPJS. In this research, the researcher focused the discussion on primary health facilities. Primary health facilities are the first place you should go to when you want to seek treatment using a BPJS card. Patients can come to the primary health facilities to seek treatment as chosen when registering BPJS. Primary health facilities consist of dental practices, private practices, clinics and class D hospitals.



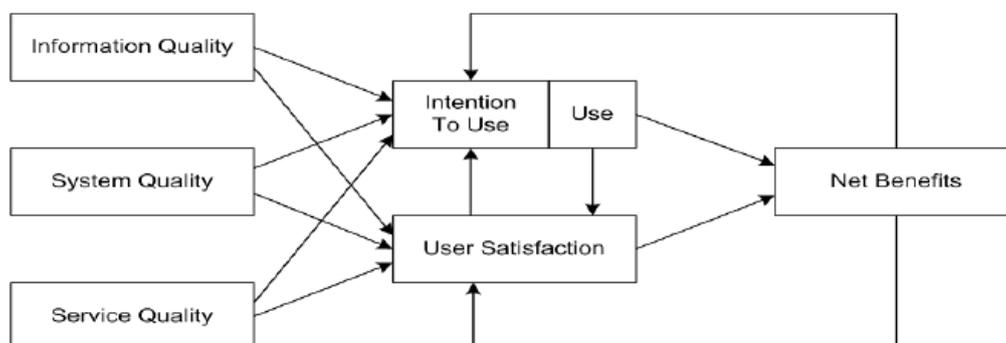
BPJS makes an online application called the Primary Care application (PCARE) in order to monitor the distribution of BPJS funds to related parties. The application that must be accessed online is a website-based patient service information system application. This application is provided by BPJS Health intended for primary health facilities to provide easy access to data to the BPJS server for registration, diagnosis, therapy, and laboratory services. PCARE is an application whose system usage is mandatory, so it is very interesting to test its success because it is different from a voluntary system. In a mandatory system the use of the system must be interpreted as actual use [1]. One model that has been developed to assess the success of an information system is the Updated D&M IS Success Model. The D&M IS Success Model has combined individual benefits and organizational benefits into the net benefits of an information system [2]. Updated D&M IS Success Model contains 6 dimensions that can measure the success of a system, i.e. Information Quality, System Quality, Service Quality, Use, User Satisfaction, and Net Benefit [3]. Several studies on health information systems that use the D&M IS Success Model are measuring the success of HIS in healthcare industries [4], quantify the performance of HIS and its impact, and provide comprehensive and accurate for improving the performance of the introduced HIS [5], validating the success models of DeLone and McLean information systems in the context of hospital information systems in developing countries [6].

PCARE is a mandatory health information system. The researcher identified the research problem to test the success of PCARE by using the Update D&M IS Success Model, namely (1) Does System Quality, Information Quality, and Service Quality have a positive effect on system use ?; (2) Does System Quality, Information Quality, and Sevice Quality have a positive effect on User Satisfaction satisfaction ?; (3) Does User Satisfaction have a positive effect on the use of the system (Use) ?; (4) Does the use of the system (Use) and User Satisfaction have a positive effect on Net Benefit ?; (5) Does Net Benefit have a positive effect on the use of the system (Use) and User Satisfaction ?.

## 2. Methodology

### 2.1. Research model

The D&M IS Success Model developed by DeLone and McLean is the most cited model in research on information system success [1,7], then DeLone and McLean improved the success model information system known as the Updated D&M IS Success Model. The model is presented in figure 1. Based on the model of the Updated D&M IS Success Model, the problems described in this study are (1) Does System Quality, Information Quality, and Service Quality have a positive effect on system use ?; (2) Does System Quality, Information Quality, and Sevice Quality have a positive effect on User Satisfaction satisfaction ?; (3) Does User Satisfaction have a positive effect on the use of the system (Use) ?; (4) Does the use of the system (Use) and User Satisfaction have a positive effect on Net Benefit ?; (5) Does Net Benefit have a positive effect on the use of the system (Use) and User Satisfaction?



**Figure 1.** Updated D&M IS success model.

This research was conducted using DeLone and McLean updated IS success model as shown in figure 1. DeLone and McLean updated IS success models have 6 dimensions of success are as follows [8]:

- System quality is used to measure the desired characteristics of the system consisting of usability, availability, reliability, adaptability and response time.
- Information quality is the overall support provided by the service provider.
- Service quality is used to measure the nature of usage, navigation patterns, frequency, tasks completed using the system.
- Use is used to measure the nature of usage, navigation patterns, frequency of use, tasks completed using the system.
- User satisfaction is used to measure user opinions about the system such as repeated use of the system, use of the system and satisfaction of task completion.
- Net benefits are a measure of success that measures the positive and negative impacts of using a system.

## 2.2. Research hypotheses

Based on DeLone and McLean's updated IS success model used in this study, there are 9 hypotheses to be investigated as follows:

- H1: System quality will positively affect use.
- H2: System quality will positively affect user satisfaction.
- H3: Information quality will positively affect use.
- H4: Information quality will positively affect user satisfaction.
- H5: Service quality will positively affect use.
- H6: Service quality will positively affect user satisfaction.
- H7: Use will positively affect user satisfaction.
- H8: Use will positively affect perceived net benefits.
- H9: User satisfaction will positively affect perceived net benefits.

This research uses Explanatory Research (explanatory study or submission of hypotheses), is research that explains explanatory studies or testing hypotheses. While the approach used in this study is a quantitative approach. The instrument used was a questionnaire in which each item represented the 6 dimensions to be measured, i.e. system quality, information quality, service quality, use, user satisfaction, and net benefits. The items were adapted from previous studies [6] and developed by the researchers themselves. The questionnaire uses five Likert scales with 1 = Strongly agree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Disagree. The following is a questionnaire used in data collection using a Likert scale can shown in table 1.

**Table 1.** Questionnaire instruments with Likert scale.

Dimentions	Item	Likert Scale				
		1	2	3	4	5
System quality	1.	I find the PCare application easy to use				
	2.	I find it easy to get the PCare application do what I want				
	3.	The PCare applicationis fleksible to interact with				
	4.	Learning to operate the PCare application was easy for me				
Information quality	1.	The information generated by the PCare application is correct				
	2.	The information by the PCare application is useful for its purpose				
	3.	Teh PCare application generate information in a timely manner				
	4.	I trust the information output of the PCare application				
Service quality	1.	There is adequate technical support from the system’s provider				
	2.	The overall infrastructure ini place is adequate to support the PCare application				
	3.	The PCare application can be relied on to provide information as when needed				
	4.	The output of teh PCare application is complete for work processes				
Use	1.	Using the PCare application enables me accomplish tasks more quickly				
	2.	Using the PCare application has improved my job performance				
	3.	Using the PCare application has made my job easier				
	4.	I find the PCare application useful in my job				
User satisfaction	1.	I am satisfied with the function of the PCare application				
	2.	The PCare application has eased work processes				
	3.	I am generally satisfied using the PCare application				
Net benefits	1.	The PCare application will help overcome the limitations of the paper-based system				
	2.	Using the PCare application will cause an improvement in patient care delivery				
	3.	The PCare applicationfacilities easy access to patient’s information				
	4.	The PCare application will enhance communication among workers				
	5.	PCare application use will cause improved decision making				

**2.3. Sample**

Population is a generalization area that consists of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions [9], so that the population can also be defined as a total number that includes all members studied. The population in this study was the primary health facilities in Malang, amounting to 72 people. The sample is part of the number and characteristics of the population. Samples were taken using the Slovin equation (1). Based on calculations using the Slovin formula, the number of samples taken was 42 respondents.

$$n = \frac{N}{1 + Ne^2} \tag{1}$$

where:

n: number of samples

N: total population

e: error tolerance limit = 10

**2.4. Reliability test**

The next analysis is to assess the reliability of the questionnaire instrument by calculating Cronbach's Alpha (CA). The amount of high reliability for CA is 0.7 and above [10]. Table 2 shows Cronbach's Alpha for each dimension, overall all components used in this study have values of more than 0.7, so the instruments used have good reliability.

**Table 2.** Reliability test result.

Dimensions	Cronbach's Alpha
System quality	0.911
Information quality	0.940
Service quality	0.883
Use	0.986
User satisfaction	0.852
Net benefit	0.915

### 3. Result

Data analysis technique using SEM is done to thoroughly explain the relationship between variables in the study. SEM is a multivariate research method that explains the relationship between several variables that exist in research [11]. In this study there are 6 latent variables consisting of 3 exogenous latent variables and 3 endogenous latent variables. Exogenous latent variables consist of information quality, system quality, and service quality. Endogenous latent variables consist of use, user satisfaction, and net benefits. SEM analysis provides standardized path coefficients, p-values, and variances used in determining the level of relationship that exists between the dimensions used. The results are shown in table 3. The results show that all hypotheses show a significant relationship except H7. System quality was found to significantly affect use with a value of ( $\beta = 0.57$ ,  $p < 0.001$ ) and user satisfaction ( $\beta = 0.17$ ,  $p < 0.001$ ). Information quality was found to significantly affect use with values ( $\beta = 0.34$ ,  $p < 0.001$ ) and user satisfaction ( $\beta = 0.22$ ,  $p < 0.001$ ). Service quality was found to significantly affect use with values ( $\beta = 0.27$ ,  $p < 0.001$ ) and user satisfaction ( $\beta = 0.55$ ,  $p < 0.001$ ). Use significantly influences net benefits ( $\beta = 0.30$ ,  $p < 0.001$ ), but when used does not significantly influence user satisfaction ( $\beta = 0.00$ ,  $p > 0.05$ ). Furthermore User satisfaction significantly affects net benefits by being rated ( $\beta = 0.12$ ,  $p < 0.001$ ).

**Table 3.** Path coefficients.

Path	$\beta$	p-value	Remarks
System quality -> Use (H1)	0.57	<0.001	Supported
System quality -> User satisfaction (H2)	0.11	<0.001	Supported
Information quality -> Use (H3)	0.34	<0.001	Supported
Information quality -> User satisfaction (H4)	0.22	<0.001	Supported
Service quality -> Use (H5)	0.27	<0.001	Supported
Service quality -> User satisfaction (H6)	0.55	<0.001	Supported
Use -> User satisfaction (H7)	0.00	0.915	Not Supported
Use -> Net benefits (H8)	0.30	<0.001	Supported
User satisfaction -> Net benefits (H9)	0.12	<0.001	Supported

### 4. Conclusions

This study uses the DeLone and McLean success models as the basis for developing the instrument. Six dimensions are measured namely Information Quality, System Quality, Service Quality, Use, User Satisfaction, and Net Benefit. The results show that there are some significant relationships between dimensions. The results are shown that all the hypotheses were significantly supported, except for H7 (Use -> User satisfaction). The hypothesis that it has the most significant influence is System quality -> Use (H1).

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