



# Contribution Title The Determinant Factors on User Satisfaction in Assessing the Quality of Online Education Management Information System

Samsul Hadi<sup>1</sup>(✉), Widia Murni Wijaya<sup>1</sup>, Aris Suharyadi<sup>1</sup>, Aminuddin Hassan<sup>2</sup>, and Cik Nur Farhana Mohamed Zaki<sup>2</sup>

<sup>1</sup> Yogyakarta State University, Yogyakarta, Indonesia  
samsul\_hd@uny.ac.id

<sup>2</sup> Putra Malaysia University, Serdang, Malaysia

**Abstract.** This study aimed to determine the quality of online education management information system in Indonesia or known as *Sistem Data Pokok Pendidikan* (DAPODIK), and the factors which make it important based on the perspectives of the user or the operator of the system. In this study, a combination of Technology Acceptance Model (TAM) and End-User Computing Satisfaction (EUCS) were used in measuring the effectiveness of the system in influencing user acceptance and user satisfaction. The population in this study consisted of the users of DAPODIK in elementary schools in Indonesia. Meanwhile, the samples were selected from several public and private elementary schools in Special Region of Yogyakarta, Indonesia. The analysis technique applied in this research was Partial Least Square-Structural Equation Modeling (PLS-SEM), conducted by implementing two stages of measurement, namely outer model analysis and inner model analysis. As a result, the attitudes perceived by the users when using DAPODIK are it is simplifying and speeding up their work, increasing their performance and productivity, easier to be learned, accessed, and operated by the users, which has influences on the users' acceptance and satisfaction.

**Keywords:** Education Management Information System · Online System Quality · User Acceptance · Satisfaction

## 1 Introduction

Education management information system play roles in collecting, processing, and integrating some data and information in order to support the policies, plans, observations, as well as making decisions in educational institutions [1]. Hence, the implementation of education management information system is necessary to manage the data of education statistics, and as the priority in arranging policy related to data of education statistics, as well as helping the stakeholders in the educational institutions and school to be able in accessing the latest data. The success of managing education management information

systems can be identified from the development of effective systems in managing education data, and the government can invest human resources to support the development [2].

In Indonesia, the education management information system is known as Sistem Data Pokok Pendidikan (DAPODIK), while the users consist of education staffs and teachers determined by the school. DAPODIK is one of the main components of educational institutions in Indonesia, and training is conducted to make the users capable in using the system. Due to the current technological era, the success of the development of education system depends on the implementation of an effective education management information system [3, 4].

Nowadays, the use of education management information system is not only for managing the education statistics, but also to carry out a quality control, effectiveness, and efficiency, which requires complex data from various levels of institutions and cooperation between educational institutions [2]. Thus, it is important to identify the progress of DAPODIK system use, to make it appropriate with its objectives and effectiveness, and since education management information system is recognized as a tool and support for managing data, evaluating education system, and making decisions [5].

Unfortunately, several problems are still experienced by the users in using DAPODIK, such as difficulties in accessing, validating, synchronizing, updating data, and adding data [6]. In addition, some users experienced technical problems such as slow access to the system and they need a strong signal to be able to access the system. Therefore, due to these problems, it is necessary to identify the determinant factors that influence user acceptance and satisfaction in using DAPODIK in Indonesia. User acceptance and satisfaction factors are examined as the approaches to measure the quality and usability of a system based on the user's perspective [7, 8].

The user acceptance toward the information system can be measured using Technology Acceptance Model (TAM) proposed by Davis. By using this model, the possibility of technology used by groups of individuals or organizations is predicted. In TAM, the general determinants of computer acceptance are described in order to reveal the users' behavior in various end user computing technologies and user populations [9]. Hence, by using TAM, it assumes that the acceptance of information technology systems is determined by two factors, namely perceived usefulness and perceived ease of use, as the factors on behavioral interest (Attitude) [10, 11]. Some researchers have also used TAM to test technology acceptance which involves information technology, organizations, and users [12, 13].

Meanwhile, user satisfaction in using education management information systems can be measured using End User Computing Satisfaction (EUCS) model. This model is employed to measure user satisfaction toward the information system by comparing their expectations and reality as an evaluation of the experiences in using the system. This model was developed by Doll & Torkzadeh as an evaluation tool with more emphasis on end user satisfaction based on technology, content, accuracy, format, time and user-friendliness of the system [14].

User satisfaction is employed as an indicator of system performance in order to make some improvements [15]. Some improvements toward the system can make a better service, as well as a better user experience. In addition, the improvements must be

carried out continuously since a repeated use of the system with a positive response is an indicator of user satisfaction. Therefore, this study aimed to identify the determinant factors toward the quality of DAPODIK system, user acceptance, and user satisfaction in Indonesia.

## 2 Method

In this study, a quantitative method was used to determine the quality of DAPODIK system in Indonesia. In addition, a combination of Technology Acceptance Model (TAM) and End User Computing Satisfaction (EUCS) were used to measure the success of education management information systems in terms of user acceptance and satisfaction. The combination of TAM and EUCS involved several variables, such as ease of use, usefulness, content, accuracy, format, timeliness, acceptance, attitude, and user satisfaction.

The populations in this study were the users of DAPODIK in primary schools in Indonesia, with a total number of 149.050 schools [16]. In each primary school, it consists of one operator of the system. Therefore, the samples were selected using a purposive sampling technique, and the criteria of the samples were the user or operator of DAPODIK. The samples were taken from several elementary schools in Special Region of Yogyakarta.

The process of collecting data was carried out by distributing online questionnaires. The analysis technique uses Partial Least Square-Structural Equation Modeling (PLS-SEM) analysis. The PLS SEM analysis was carried out through two stages of measurement: outer model analysis and inner model analysis. The first stage, the outer model analysis was carried out by testing composite reliability, outer loading, discriminant validity, and average variance extracted. The second stage, the inner model analysis was carried out by testing the coefficient of determination ( $R^2$ ), path coefficient ( $\beta$ ), confidence interval and predictive relevance ( $Q^2$ ).

## 3 Result

In this study, the respondents consisted of 263 users or operators of DAPODIK, dominated by 160 female respondents (61.6%) and 103 male respondents (38.4%). The data obtained from the respondents were used to measure the quality of DAPODIK system based on Technology Acceptance Model (TAM) and End User Computing Satisfaction (EUCS) using Partial Least Square-Structural Equation Modeling (PLS-SEM).

### 3.1 Outer Model

The outer model was applied to assess the validity and reliability of the model, to be used in a measurement. The result of outer model analysis (Fig. 1) was obtained through testing of outer loading, composite reliability, average variance extracted, and discriminant validity. After conducting the four stages, it indicates that the model designed in this study has met the requirements and statistically has good characteristics.

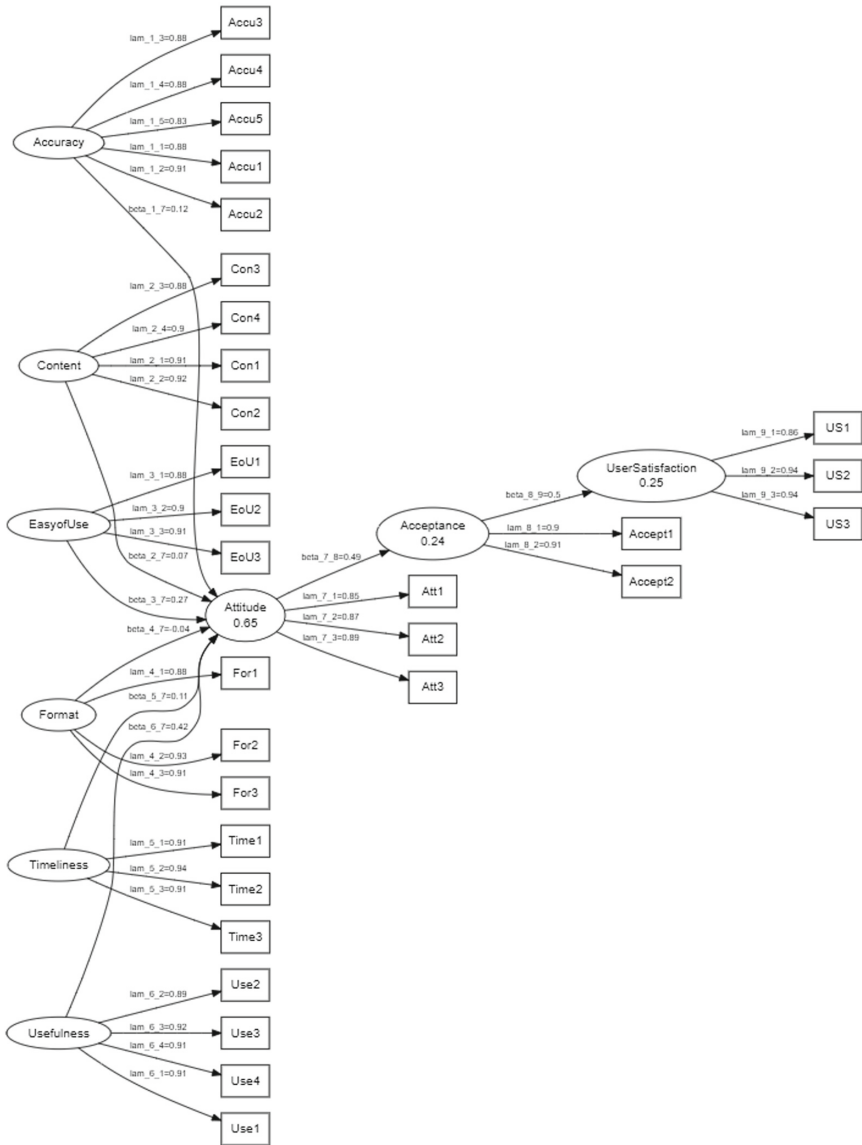


Fig. 1. Research model

**Outer Loading.** Outer loading was carried out to identify the validity of the indicator which measures the variable. The outer loading value can be stated to have reliability if it reaches a value  $> 0.7$  [17–19], and based on the standard value of convergent validity, if the loading value is  $< 0.7$ , it will be removed from the model. Based on the test results, the data in Fig. 1 indicate that all outer loading values have met the requirements or  $> 0.7$ . Hence, it is valid according to the result of outer loading.

**Table 1.** The result of composite reliability.

No.	Variable	Composite Reliability
1	Accuracy	0.94
2	Content	0.95
3	Easy of Use	0.93
4	Format	0.93
5	Timeliness	0.94
6	Usefulness	0.95
7	Attitude	0.90
8	Acceptance	0.90
9	User Satisfaction	0.94

**Table 2.** The result of average variance extracted.

No.	Variable	Average Variance Extracted
1	Accuracy	0.86
2	Content	0.85
3	Easy of Use	0.89
4	Format	0.90
5	Timeliness	0.91
6	Usefulness	0.90
7	Attitude	0.85
8	Acceptance	0.90
9	User Satisfaction	0.91

**Composite Reliability.** Composite reliability (CR) testing was carried out to determine the value of construct reliability and the standard CR value was  $> 0.7$  [17–19]. Based on the result of CR test (Table 1), all CR values have met the standard value or  $> 0.7$ . Hence, all variables have met the requirements.

**Average Variance Extracted.** Average Variance Extracted (AVE) testing is important in determining the convergent validity of a construct. The requirement of convergent validity is determined by the AVE value, with minimum value of 0.5 [17–19]. In Table 2, the result of AVE testing indicates that it has met the requirement since all variables are  $> 0.5$ .

**Discriminant Validity.** Discriminant validity testing is carried out to determine the reflective indicator used as a good measurement of the construct. The test is carried out by applying cross loading test, which is used to compare the correlation of the indicator and the construct. The value of cross loading can be stated to be good if the

**Table 3.** The result of inner model analysis.

Hypothesis		Analysis		
No.	Path	$\beta$	R <sup>2</sup>	Q <sup>2</sup>
1	Content – Attitude	Insignificant	Strong	Predictive relevance
2	Accuracy – Attitude	Insignificant		
3	Format – Attitude	Insignificant		
4	Timeliness – Attitude	Insignificant		
5	Usefulness – Attitude	Significant		
6	Ease of Use – Attitude	Significant		
7	Attitude – Acceptance	Significant	Moderate	Predictive relevance
8	Acceptance – User Satisfaction	Significant	Moderate	Predictive relevance

correlation between the indicator and the construct is higher than the correlation with other constructs. Based on the results of cross loading test, the value of each variable has a higher value than the correlation with other constructs. In other words, the cross loading value has met the requirement of discriminant validity.

### 3.2 Inner Model

Inner model is a structural model that describes the relationship between exogenous and endogenous variables. The result of inner model analysis (Table 3) was obtained by testing the path coefficient ( $\beta$ ), coefficient of determination (R<sup>2</sup>), predictive relevance (Q<sup>2</sup>), and confidence interval.

**Path coefficient ( $\beta$ ).** Path coefficient testing is used to measure the significance and relationship between constructs. The path coefficient value ranges from  $-1$  to  $+1$ , and if the path coefficient value is getting closer to  $+1$ , then the relationship between the constructs is stronger. Meanwhile, if the path coefficient value is close to  $-1$ , then the relationship between the constructs is weaker [17–19]. In this test, the threshold value used is  $> 0.1$  which indicates that the relationship between constructs has a significant effect. In addition, based on the result, 1 of the 8 paths got a value of  $< 0.1$ , namely Content-Attitude (0.076), Format-Attitude ( $-0.01$ ), and Timeliness Attitude (0.084). It can be concluded that 3 paths did not have a significant effect.

**Coefficient of Determination (R<sup>2</sup>).** Coefficient of determination (R<sup>2</sup>) was carried out to identify the value of the endogenous construct explained by the exogenous construct in order to determine the variables that were influenced by other variables. The standard of measurement used in this test was 0.670 means strong, 0.333 means moderate, and 0.190 and below indicates a weak level of variance [17–19]. The result of the coefficient of determination reveals the accuracy, content, format, ease of use, timeliness, and usefulness of the variables, and it can reveal 66% of changes in the attitude variable, while the attitude variable explains 33% of the change in the acceptance variable. Meanwhile, the acceptance variable is able to explain 36% of changes in the user satisfaction variable.

**Predictive Relevance (Q2).** Predictive relevance testing aimed to prove that certain variables with other variables have predictive relevance. The threshold value used in this test is  $> 0$ . The result of the predictive relevance test indicates that all variables used have predictive relevance.

**Confidence Interval.** Confidence interval testing aimed to test the research hypothesis by identifying the value of confidence level which indicates the lower and upper limits. The test results can be stated to be significant if the upper and lower limits are on the same axis, both have positive values or both have negative values. The results of the confidence interval test indicate that there were 4 hypotheses accepted from 8 hypotheses, namely Usefulness-Attitude, Ease of Use-Attitude, Attitude-Acceptance, and Acceptance-User Satisfaction.

## 4 Discussion

The quality of DAPODIK system based on the perspective of the user or operator is discussed, and also based on the result of the tests. Based on the result, the attitude variable is quite significant in the research model (Fig. 1). There are two variables that have positive and significant effects on the attitude variable, namely usefulness and ease of use. The attitude variable is also a strong determinant of the acceptance variable and it is considered as mediation on many variables in the model, since the attitude variable in TAM becomes an important factor to determine the extent to which the user's attitude changes [20].

In this study, a relationship between the acceptance variable and the user satisfaction variable is found, and it is the strongest relationship among the relationships between other variables. The influence of acceptance is the key of user satisfaction and the acceptance variable, as influenced by the attitude variable. Acceptance shows the positive attitude of users towards the system and as a strong predictor of acceptance toward the system [21, 22].

The user acceptance can influence user satisfaction since the main goal of user acceptance is user satisfaction with the system. In other words, user satisfaction is used as a parameter to measure the performance of the system [23]. Thus, if the system performance is not optimal, some improvements can be made to the system and the users utilize the system continuously since repeated use of the system can be used as an indicator of user satisfaction.

### 4.1 The Influence of Usefulness on Attitude

Usefulness is a perception obtained when DAPODIK user or operator is using the system. The perceptions on the usefulness include making the tasks easier, speeding up the users' work, and increasing the users' performance and productivity. Based on the perceptions of the users or operators of DAPODIK, the usefulness variable has a positive and significant effect on attitude. Hence, the usefulness perceived by the user when using the system affects the users' attitudes, and the users perceive that the system is useful to support their work. It is in line with Suryawan & Prihandoko who found that the perceived usefulness influenced the users' attitude toward the system [24].

#### **4.2 The Influence of Ease of Use on Attitude**

Perception of ease of use is the perception that is felt when the users use DAPODIK. It only requires less effort since the system provides ease of learning, access, and operation perceived by the users. Based on the result of the tests, ease of use variable has a positive and significant influence on attitude. In other words, if the DAPODIK system is easy to use, the users' attitude in using the system will be increasing properly. It is in line with the research conducted by Chan & Hu which reveals that there is a relationship between ease of use and attitudes towards acceptance of online education management information systems, and the ease of use of the system has influences on the users' attitudes in using online systems [25].

#### **4.3 The Influence of Attitude on Acceptance**

Attitude becomes a variable that reveals the changes experienced by the user and reveals the user acceptance in using DAPODIK. Based on the result, attitude variable has a positive and significant effect on user acceptance. The more users get a positive experience in using DAPODIK, the higher the user acceptance of the system.

In addition, some researchers found that attitude is an important factor that shows the user's attitude, such as the user's mood, feelings, and emotions [20, 23]. Zhang et al. [20] who analyzed the effect of attitude on the use of information and communication technology, found that attitude had a significant effect for the initial use and continued use.

#### **4.4 The Influence of Acceptance on User Satisfaction**

The acceptance variable is the result of the impact given by the user toward the use of DAPODIK. Based on the result, the acceptance variable has a positive and significant effect on user satisfaction. As a result, the greater the user acceptance toward DAPODIK, the higher the satisfaction perceived by the users or operators of DAPODIK. In addition, some researchers found that acceptance is an indicator that influences the user attitudes towards the system, which becomes is a strong predictor of the user acceptance of a system [26, 27].

### **5 Conclusion**

The results reveal that users' perspective in assessing the quality of DAPODIK system in Indonesia is DAPODIK system is useful and help them to work. Moreover, in terms of ease of use, the users are confident that DAPODIK system is easy to learn and operate. In addition, based on their attitude, the users get a positive experience in using DAPODIK system, such as supporting their work. Likewise, the result on the aspect of user acceptance reveals that the level of user acceptance is high, so the users are satisfied with the quality of DAPODIK system. This research was conducted to identify the quality of DAPODIK system, especially the main factors needed for the success of DAPODIK system in Indonesia. The results of the study refer to the use DAPODIK system as the main component to improve educational services in Indonesia.



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