

FACTOR INFLUENCING THE USER SATISFACTION IN ADOPTING E-LEARNING BASED ON OPEN SOURCE LEARNING MANAGEMENT SYSTEM PLATFORM AT PT.MAHADANA DASHA UTAMA

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ABSTRACT

Knowledge Management System (KMS) is important system to be applied in each company which purpose to maintain the company's knowledge assets. This is very important because the employee tacit knowledge is potentially lost (knowledge walkout) due to employee turnover during a company's knowledge is not well documented using the system. PT Mahadana Dasha Utama (MahaDasha) is one of the company has been adopting e-learning system. MahaDasha is an investment holding company with several business units. MahaDasha uses open source moodle learning management system technology platform. The idea is triggered by the company's efficiency program in information technology investment both infrastructure and application development so it enforce MahaDasha's IT team to find out the best innovation solution by optimizing open source technology which suitable with the user's need. Therefore, this study aims to evaluate the effectiveness of e-learning adoption based on open source moodle technology platform by developing The DeLone & McLean Information Success Model and empirically measured the relation between aspect of information quality, system quality, service quality, user readiness and user satisfaction. The quantitative data are gained through questionnaire by distributing the questionnaires to all MahaDasha employees who use e-learning. The analysis of data indicated that the user satisfaction is the most positive influenced by information quality and user readiness. The contribution of this research was performed by evaluation process both for quality of trainer and IT support team based on result of the research. In the other hand, the system quality had been re-reviewed whether moodle application is suitable or not for user needs in MahaDasha.

Keywords: *E-Learning, Application, Open Source, Knowledge Management System, Learning Management System*

1. INTRODUCTION

1.1 Background

The use of e-Learning is widely used by institutions of education or training, now e-Learning technology has penetrated into various types of industries such as banking, airlines and others. This becomes a new trend in the knowledge management through the means of supporting the technology and becoming more efficient and effective training medium. Mahadasha is one of the companies which use an e-learning technology based on open source

technology platform. The reasons the company has adopted moodle learning management system are for documenting the company's core values content into a digital format, measuring the level of user understanding about the company's core values and the software is easy to customize

According to research [1] that there are several main factors affecting the success of learning management system (LMS) such as system quality, information quality are the two main factors affecting the success of LMS through user satisfaction that as well motivate users to

understand the material through the system. According to other studies [2] that there are three variables measuring the success of an information system such as information quality, system quality and service quality. Thus, in the evaluation of adopting KMS technology of e-learning application based on open source moodle in MahaDasha, the authors used several references of several variables of similar research model and added the variable of readiness factor of the user to evaluate the extent of the effectiveness of the application of the technology based on the factors that influence the level of user satisfaction in MahaDasha. Therefore, the objectives this study is to investigate the factors of that influence the user satisfaction during adopting e-learning based on open source technology platform.

During the research, we start with research question, literature review, develop research model, define hypothesis, distribute questionnaire, result analysis, conclusion and recommendation.

1.2 Research Problem

Based on above background description and previous research related system evaluation through the analysis of successful factor during learning management system implementation so research problem of this research are :

- 1) Does the information quality factor of e- open source learning affect the level of e-learning user satisfaction in MahaDasha?
- 2) Does the system quality factor of source based platform affect the level of e-learning open learning user satisfaction in MahaDasha?
- 3) Does the service quality factor of open source e-learning affect the level of e-learning user satisfaction in MahaDasha?
- 4) Does the user readiness factor of open source e-learning affect the level of e-learning user satisfaction in MahaDasha?

1.3 Scope of The Research

The scope of this research will be focused on the following such as :

- 1) This research is only conducted at MahaDasha as a case study.
- 2) The respondent are the employee of MahaDaha who use the e-learning application.
- 3) The result of the research are only used for improving e-learning implementation in MahaDasha.

1.4 Research Objectives

Based on above background description and research problems, the objectives of this research are the following :

- 1) Evaluate e-learning implementation based on open source learning management system platform, by identify and analyze the factor influencing the user satisfaction in adopting e-learning.
- 2) To analyze of what the factors or dimension that shall be fixed and how to fix it.
- 3) Contribute to help the management to evaluate knowledge management system implementation through e-learning open source technology platform.
- 4) Contribute to help the Information Technology (IT) department of MahaDasha, to evaluate adopted the e-learning technology.
- 5) To investigate the factors of that influence the user satisfaction during adopting e-learning.
- 6) Provide insight for next similar research that may be conducted in the future.

2. THEORITICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

2.1 Knowledge Management System

Knowledge management system definition according to [3] is a way to achieve the goal of knowledge management applied by companies, industry groups using information technology.

The knowledge management is important because tacit knowledge possessed and gathered by every individual in any organizational units are potentially lost (knowledge walkout). The role of knowledge in the development of a business organization environment is considered important to achieve a particular organization's business goals. The knowledge management aims to develop knowledge strategy that facilitates easy access to valuable knowledge according to [4].

Knowledge management system built in MahaDasha has one of the goals to prevent knowledge walkout, to measure employee knowledge on understanding in company's core values, to modify the training process from conventional model training to online based training through e-learning. According to [5], the use of a learning is recommended and designed to improve learning motivation and facilitate the management of more effective learning activities.

2.2 E-Learning

E-learning is one of the knowledge management system product. According to [3], e-learning is defined as a structural learning method by using electronic system or computer to support learning process. One of MahaDasha's goals in implementing e-learning is cost efficiency training. This is supported by research conducted by [4] that the more e-learning users the cost of education for a student is lower than the cost for a student through the conventional class.

In addition there are several factors that influence student's motivation to learn to use e-learning such as maximizing e-learning content through video, audio and data quality by using integrated technology to create a conducive environment so as to motivate students in maximizing the role of e-learning [8]. While the result according to [9], states that to maximize blended learning classroom then the educators and students should be made comfortable and trained by using newer technology. Meanwhile, according to [10] that the condition of e-learning facilitate affect the interest of learning.

2.3 Open Source Moodle Application

Moodle application was first developed by Martin Dougiamas, a scientist and founder of Moodle Pty Ltd located in Perth, Australia. The moodle application is a Learning Management System (LMS) based on an open source platform developed that serves to include learning materials and is able to accommodate learning systems governing the roles of trainers, trainees, learning management, the use of learning resources, monitoring the development of trainee learning and the process of its evaluation system, a successful implementation of open source software.

Moodle abbreviation is a Modular Object Oriented Dynamic Learning Environment. The application is designed as an open source learning platform technology that has completed feature, able to design a learning management system from course level to university level and it has some plugins that can be dynamically activated as for user requirements.

2.4 DeLone & McLean IS Success Model

DeLone & McLean Information System Success Model is a framework to measure a complex independent variables in information systems research [11]. The DeLone & McLean IS Success Model is one of the most comprehensive models supported by many empirical studies and reviewed

more than 180 studies from several publications and synthesized with six factors that contribute to the success of an information system [6]. Below the several dimension of DeLone & McLean model are used in this research model :

a. Information Quality

Information quality is one dimension of information system characteristics which expected in terms of output information generated system useful for application users, There are several indicators of the characteristics that can be measured by the quality of information, such as : accuracy, adequacy, availability, completeness, conciseness, consistency, format, precision & etc. [7].

b. System Quality

System quality is the dimension of information system characteristics which expected in terms of usability aspects and characteristics of a system performance. There are several indicators of the characteristics that can be measured for the variable of

information systems quality such as: access, convenience, customization, data accuracy, data currency, ease of learning, ease of use, efficiency, flexibility & etc. [7].

c. Service Quality

Service Quality dimensions represent the quality of support gained by application users from information systems departments and IT Support personnel. There are several indicators of the characteristics that can be measured for the quality of service, such as: assurance, empathy, flexibility, interpersonal quality, intrinsic quality, training IS, reliability, responsiveness, tangibles and etc. [7].

d. User Satisfaction

The dimension of user satisfaction is the level or level of user satisfaction when utilizing the information system. This dimension is one of the most important factors of information system success. There are several indicators of the characteristics that can be measured for user satisfaction, such as: adequacy, effectiveness, Efficiency, Enjoyment, Information Satisfaction, Overall Satisfaction and System Satisfaction [7].

2.5 Another IS Success Dimension

DeLone & McLean's success information model can be developed according to the needs of the research, thus the research model is developed [5]. Due to the adoption of e learning in MahaDasha is intended for autonomous learning, so based on the concept of user readiness was proposed by [1].

a. User Readiness

According to [1], he defined readiness for online learning in terms of aspect the ability to engage in autonomous learning. This variable also added in this research model to find out whether user readiness has affect to user satisfaction during e-learning adoption.

2.6 Previous KMS Research

According to [3] and [12], Satisfactory user of online learning system is influenced by the quality of information, system quality and service quality. While the level of user satisfaction affect the net

benefit. Meanwhile according to [8], the level of user satisfaction e-learning is influenced by the level of discipline and student motivation and e-learning features. In the other hand, according to [9]The level of user satisfaction of Learning Management System (LMS) is influenced by the quality of information. While the quality of the system, the quality of information and service quality affect the intensity of the use of LMS.

3. METHODOLOGY

3.1 Research Model

Based on the previous research so that the evaluation of KMS could be used by e-learning platform based on open source in MahaDasha and it can use research model with the factor and the indicator of each independent variabel (X), and the factor and indicator of dependent variable (Y), as we can see in the figure 1 below :

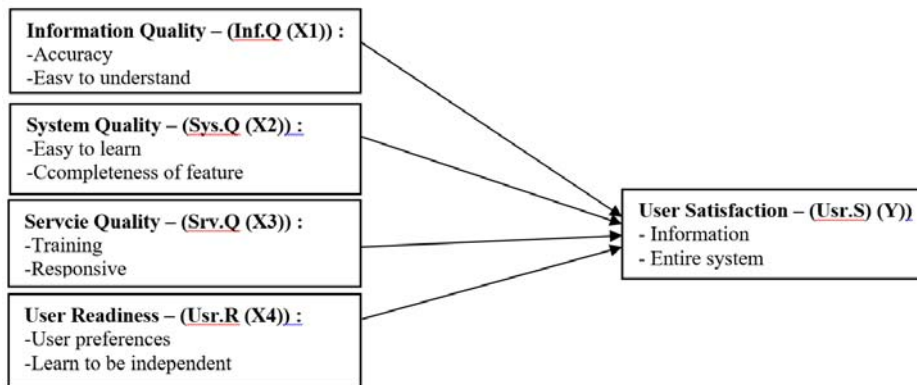


Figure 1. The Modified DeLone & McLean IS Success Model

3.2 Hypotheses

The research utilized by modify DeLone and McLean IS success model based on model presented in figure 1 above, so the hypotheses are of the following :

- H1a : Factor of information quality positively affects to the level of e-learning user satisfaction.
- H1b : Factor of information quality does not have positively affects to the level of e-learning user satisfaction.
- H2a : The factor of system quality positively affects to the level of e-learning user satisfaction.
- H2b : The factor of system quality does not have positively affects to the level of e-learning user satisfaction.
- H3a : The factor of service quality positively affects to the level of e-learning user satisfaction.
- H3b : The factor of service quality does not have positively affects to the level of e-learning user satisfaction.
- H4a : User readiness factor positively affects to the level of e-learning user satisfaction.
- H4b : User readiness factor positively does not have affects to the level of e-learning user satisfaction.

3.3 Population and Data Collection Technique

The population of this research were the employees of MahaDasha. This population of this research were 27 employee consisting 3 business system, 4 finance accounting, 3 internal audit, 3 legal, 2 procurement, 2 human resource, 1 strategic planning, 3 tax, 2 insurance & risk management, 2 corporate communication, 1 secretary and 1 business process improvement.

3.4 Variable Measurement Indicators

This research consisting 2 variables, namely independently variable and dependent variable. Independent. Independent variable was the factor influencing of E-Learning Implementation measured with the following indicators:

- 1) The E-Learning information material content is accurate and relevant (Inf.Q₁)
- 2) The E-Learning material content is easy to understand (Inf.Q₂)
- 3) The application are easy to learn and user friendly (Sys.Q₁)
- 4) The application feature is fully completed (Sys.Q₂)
- 5) Trainer trains sufficiently to application end user (Srv.Q₁)
- 6) The application support team responsive during conducting support services (Srv.Q₂)
- 7) I prefer to choose the training activity based on e-learning rather than to convention model training (Usr.R₁)
- 8) I am able to learn independently during utilize e-learning (Usr.R₂)

Meanwhile dependent variable for user satisfaction that was measured using several indicators :

- 1) I am satisfy with e-learning material content (Usr.S₁)
- 2) I am satisfy with overall of e-learning system (Usr.S₂)

4. RESULT AND DISCUSSION

4.1 Respondent's Characteristics

The questionnaires distributed to all MahaDasha employee who use e-learning with response rate by 89%. The survey consisted of 10 questions which 2 questions were used for measuring user satisfaction. Bellow table show more detail information regarding the demographic data of respondents in MahaDasha :

Table 1. MahaDasha's Employee Descriptive Statistics

Characteristic	Frequency	Percentage
Gender		
Male	19	76%
Female	6	24%
Age		
18 – 25	1	4%
26 – 29	5	20%
30 and above	19	76%
Job Position		
Manager	11	44%
Supervisor	6	24%
Staff	8	32%

4.2 Measurement of Validity and Reliability

Validity is an indication of instrument's ability to measure what it claims to and reliability is the repeatability and consistency of survey instrument [1]. The result of validity test and reliability test are presented bellow tables 2. The Result of Validity Test and table 3. The Correlation matrix with degree of freedom is 25 and the probability is 0.05 so the *r* table is 0.381 then we note that the indicator of variable in questionnaire is valid if *R*_{cal} is bigger than 0.381.

Table 2. The Result of Validity Test

Variable	Indicator	<i>R</i> _{cal}
Information Quality (Inf.Q)	Accuracy (Inf.Q ₁)	0.766
	Easy to Understand (Inf.Q ₂)	0.664
System Quality (Sys.Q)	Easy to Use (Sys.Q ₁)	0.458
	Completeness (Sys.Q ₂)	0.500
Service Quality (Srv.Q)	Level of Training (Srv.Q ₁)	0.749
	Responsive (Srv.Q ₂)	-0.055
User Readiness (Usr.R)	User Preferences (Usr.R ₁)	0.508
	Autonomous Learning (Usr.R ₂)	0.701
User Satisfaction (Usr.S)	Content (Usr.S ₁)	0.822
	Overall System (Usr.S ₂)	0.808

The reliability test is evaluated using Cronbach's Alpha. A variable is considered reliable value if the result of reliability test is more than 0.600. As per bellow table 3 correlation matrix and Cronbach's

alpha value is 0.800, it indicates high reliability survey instrument where Cronbach's alpha scores higher than 0.600.

Table 3. The Correlation Matrix

	Inf.Q1	Inf.Q2	Sys.Q1	Sys.Q2	Srv.Q1	Srv.Q2	Usr.R1	Usr.R2	Usr.S1	Usr.S2
Inf.Q1	1									
Inf.Q2	0.791839	1								
Sys.Q1	0.19912	0.166103	1							
Sys.Q2	0.222539	0.156813	0.439078	1						
Srv.Q1	0.582566	0.445742	0.507696	0.343136	1					
Srv.Q2	0	0.193649	0.551411	0	0	1				
Usr.R1	0.088922	-0.08006	0.091192	0.238546	0.175195	-0.49614	1			
Usr.R2	0.403743	0.226941	0.150782	0.142349	0.485095	-0.29298	0.617774	1		
Usr.S1	0.70015	0.600099	0.062137	0.376412	0.517294	-0.33806	0.471728	0.482845	1	
Usr.S2	0.450841	0.353553	0.201347	0.388091	0.530088	-0.36515	0.622752	0.695376	0.771517	1

4.3 Regression Analysis

The result of regression analysis relating dependent variable (user satisfaction) and independent (information quality, system quality, service quality and user readiness) are shown in bellow regression statistics table and result regression analysis table.

As per bellow table 4. Regression Statistics result show that *R Square* = 0.624 tells this model contain 62,4% of variance in the equation model where 37,6% of another variance are explained in outside of the equation model. These *R Square* values can be counted as strong value.

Table 4. Regression Statistics

Regression Statistics	
Multiple R	0.79027
R Square	0.624527
Adjusted R Square	0.549433
Standard Error	0.436308
Observations	25

The Research model has eight hypotheses. This model was tested as one model only :

- 1) Information Quality, System Quality, Service Quality and User Readiness as predictors of User Satisfaction

Based on the regression test in the bellow table suggest that the two independent variables are significant so the established regression model is :

$$\text{Usr.S} = 0.122 + 0.293. \text{Inf.Q} + 0.181. \text{Sys.Q} + 0.142. \text{Srv.Q} + 0.371. \text{Usr.R} + \epsilon$$

Where Usr.S denotes User Satisfaction, Inf.Q denotes Information Quality, Sys.Q denotes System Quality, Srv.Q denotes Service Quality, Usr.R denotes User Readiness and ϵ denotes error factor . Above equation model is developed based on bellow statistics test table :

Table 5. The Result of Regression Analysis

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.12222071	0.82847141	0.147525559	0.8841943	-1.6059404	1.8503818	-1.6059404	1.8503818
Inf.Q	0.29369444	0.1351208	2.173569425	0.0419216	0.0118374	0.5755515	0.0118374	0.5755515
Sys.Q	0.18109897	0.22279072	0.812865869	0.425866	-0.2836343	0.6458323	-0.2836343	0.6458323
Srv.Q	0.1422324	0.14309541	0.993968977	0.3321124	-0.1562594	0.4407242	-0.1562594	0.4407242
Usr.R	0.37126728	0.11560992	3.211378999	0.0043809	0.1301092	0.6124253	0.1301092	0.6124253

The above equation model covers the test of the hypotheses H1a, H1b, H2a, H2b, H3a, H3b, H4a and H4b. As above table show that *p-values* of the relationship between information quality and user satisfaction is 0.04 that is less than 0.05, meanwhile *p-values* of the relationship between system quality and user satisfaction is 0.42 and *p-values* of the relationship between service quality and user satisfaction is 0.33 are above 0.05, however *p-values* of the relationship between user readiness and user satisfaction is 0.004 that is less than 0.05.

Based on this result, lead us the following conclusions that H1a, H2b, H3b and H4a are accepted but H1b, H2a, H3a and H4b are rejected based on above the result of regression analysis.

The above analysis also leads us to the following result explanation :

- H1a : Factor of information quality positively affects to the level of e-learning user satisfaction is accepted
- H2b : The factor of system quality does not have positively affects to the level of e-learning user satisfaction is accepted
- H3b : The factor of service quality does not have positively affects to the level of e-learning user satisfaction is accepted
- H4a : User readiness factor positively affects to the level of e-learning user satisfaction is accepted
- H1b : Factor of information quality does not have positively affects to the level of e-learning user satisfaction is rejected
- H2a : The factor of system quality positively affects to the level of e-learning user satisfaction

- is rejected although have positively affects but it' not signification so this hypothesis is rejected
- H3a : The factor of service quality positively affects to the level of e-learning user satisfaction is rejected although have positively affects but it' not signification so this hypothesis is rejected
- H4b : User readiness factor positively does not have affects to the level of e-learning user satisfaction is rejected

All the hypothesized relations were positively significant except the relation between system quality and user satisfaction, and also relation between service quality and user satisfaction. The analysis of independent variable influences in the model show that user readiness is the most influencing variable with *p-values* of the relationship between user readiness and user satisfaction is 0.004, meanwhile the information quality variable is coming next with a significant level 0.041. Finally, it is clear that only that the most influencing are user readiness variable then followed by information quality variable.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Different with previous research that this case study research aim to evaluate open source e-learning implementation based on factors : information quality, system, service quality and user readiness.

The main objective of the research is to investigate the factors of that influence the user satisfaction during adopting e-learning based on open source platform technology, so based on regression result of this research, it can be concluded that :

- 1) The result of evaluation of Knowledge Management System (KMS) implementation by adopting e-learning based on open source technology in MahaDasha can be concluded that information quality has significant influence to user satisfaction so the result of this research support part of the result research that found by [3] and [9], furthermore the user readiness also has significant influence to user satisfaction, meanwhile the system quality and the service quality does not affect the user satisfaction in MahaDasha.
- 2) This research reveals that the higher of the information quality generated from e-learning, the higher user satisfaction will be obtained. In the other hand this research also reveals that the higher of the user readiness for in terms of aspect the ability to engage in autonomous learning, the higher user satisfaction will be obtained.
- 3) According to [1], increasing user satisfaction also lead to the success of the system so it is important to enhance this factor by motivate the trainer to prepare more qualified information with appropriate content or relevant content information that meet to the employee expectations. Supposed to be with the relevant information so may impact to the user satisfaction. Furthermore, to enhance user satisfaction by increase user readiness with ability to engage in autonomous learning for employee and increase employee confident level in using e-learning.
- 4) Based on above conclusion, so we also conclude that the users more concern about the substance of the information content in application rather than the system quality and support services quality. Thus, any quality Learning Management System (LMS) application platform does not contribute to influence user satisfaction in MahaDasha.
- 5) In the other hand, the user readiness factor influence significantly to the user satisfaction so we also conclude that with e-learning adoption, the users are ready to learn independently without formal training. Thus, the company's goal through e-learning program can be concluded that e-learning program is running effectively.
- 6) Evaluation of KMS implementation in MahaDasha is measured by 5 Likert scale indicator (scale 1 = strongly disagree, 2 = disagree, 3 = quite agree, 4 = agree and 5 = strongly agree) with the average result of satisfaction level reach 3,62 (enough agree) so it can be concluded the user quite satisfied with e-learning application.

5.2 Recommendation.

Based on the conclusion explained above, the recommendation for next research are :

- 1) To conduct further research especially for the system quality and service quality factors with has anomaly result with the aim to examine what are the causes factors of the these variables are not affect the user satisfaction regarding to the previous similar research reference that the system quality and service quality affect the user satisfaction [3] and [9]. So the moodle application shall be reviewed further and both trainer and IT support team shall be evaluated.
- 2) System quality had not good impact in user satisfaction, it is recommended to develop the system to be more easy to use, more flexible, a feature rich system, can be accessed anywhere, more user friendly and etc.
- 3) Service quality had not good impact in user satisfaction, it is recommended to provide qualified IT support team with aim to support more responsive during conducting support services. Also recommend to provide qualified trainer who could trains sufficiently to the e-learning application.
- 4) Another further research is needed to investigate other factors that may affect user satisfaction of the e-learning adoption.

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