SOFTWARE QUALITY ANALYSIS USING THE ISO 25010:2011 STANDARD ON THE ONLINE SINGLE SUBMISSION SYSTEM

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Abstract

The analysis conducted on software quality uses the ISO 25010:2011 standard on the Electronically Integrated Business Licensing System which is useful for calculating the quality of software produced by a company that meets the requirements set by the world standard body, namely, ISO. This study uses the usability characteristics contained in the ISO 25010:2011 standard. The stages carried out in the analysis of software quality in the licensing system are trying to be integrated electronically using the Analytical Hierarchy Process (AHP) method, an assessment of six sub-characteristics of usability, namely appropriateness recognizability, learnability, operability, user error protection, user interface aesthetics and accessibility. The testing of the licensing system is trying to be integrated electronically using a questionnaire using the J.R Lewis method, with 19 questions. The test results on the appropriateness recognizability sub-characteristics got a value of 1.504, the learnability sub-characteristic got a value of 0.776, the operability sub-characteristic got a value of 0.688, the user error protection sub-characteristic got a value of 0.82, the user interface aesthetics sub-characteristic got a value of 0.255, accessibility sub characteristics get a value of 0.215. The total results of the six sub-characteristics obtained a value of 4.258, from 5 indicators of achievement and feasibility of test results, with the total criteria of test results ranging from 4.10 to 5.00 with very good information, it can be concluded that the overall licensing system is trying to be integrated electronically capable of carrying out all functions and capabilities that are available, effective and efficient in use, and have reliability on the user's side.

Keywords: ISO 25010:2011, Software Quality, Usability, Analytical Hierarchy Process (AHP), Electronic Integrated Business Licensing System.

I. II. INTRODUCTION

The analysis in this study was carried out using ISO 25010 which is useful for calculating the quality of software produced by a company that meets the requirements set by the world standard body, namely, ISO. In support of making a decision using the Analytical Hierarchy Process (AHP) method. Therefore, the authors raised the research with the title " Analysis of Software Quality Using ISO 25010:2011 Standard on an Electronically Integrated Business Licensing System".

The research purpose:

1. Measuring the priority of an electronically integrated business licensing system based on the Analytical Hierarchy Process (AHP).

2. Knowing the quality results from usability characteristics.

3. Provide recommendations on the electronically integrated business licensing system based on the results obtained for each sub-characteristic

The usefulness obtained from this research for the Ministry of Investment and Downstream Industry / Indonesia Investment Coordinating Board is that the Ministry of Investment and Downstream Industry / Indonesia Investment Coordinating Board can analyze and determine user satisfaction with the results obtained, and can be used as recommendations to improve the quality of their electronically integrated business licensing system.

Part I contains an introduction, Part II contains a literature review, Part III contains research methodology, Part IV contains research results and discussion, part V describes conclusions and suggestions as well as recommendations for test results.

III. RELATED WORK

Analysis of the Quality of E-Office Applications of the Ministry of Agrarian and Spatial Planning of the National Land Agency Using the ISO 25010 Method by Lilik Tiara Giantri. The problems in this research are testing the e-office application of the Ministry of ATR/BPN using the ISO 25010 method, and determining the weight using the AHP method. The total score generated from all tests is 4.808 out of a total value of 5 e-office applications. The e-office application can carry out all the available functions, has reliability, and is easy to use. [5]

Quality Analysis of Document File Applications Using the ISO 25010:2011 Method (Case Study: PT. Averin Informatika Teknologi) 2021 by Apepullah. Testing the quality of document file applications using the ISO method 25010:2011 who did the test with 7 characteristics and 26 sub characteristics carried out by the black box testing method, the stress testing method and the J.R Lewis questionnaire. Overall score resulting from all the tests that have been carried out is 4.852 of the total value of 5 from the document file application. That the document file application is able to run all functions are available, have reliability and application is easy to use. [2]

Analysis of Functional Suitability and Usability in Karma Simanis Information Systems Based on ISO/IEC 25010 by Made Dwi Mulyawan, Ida Bagus Alit Swamardika, Komang Oka Saputra. This study conducted an analysis of functional suitability and usability of Karma Simanis information system through an assessment using ISO/IEC 25010. Karma Simanis has value quality of 75.99% which consists of a functional suitability quality value of 75.85% and a usability quality value by 76.09%. In addition, the results of the functional suitability and usability assessment shows that the greater the value of functional suitability quality, then will affect the value of usability quality on the Karma information system The sweet. [9]

Quality Analysis of Online Examination System Using ISO 25010 Standard by Gugi Tyas. Based on the results of research on the quality of the E-Exam application based on the ISO 25010 standard. The results show a reliability value of 54.43% so it can be said that it has not met the reliability standards set by the Telcordia standard. [14]

Evaluation of the Quality of the West Java Provincial Government's Greeting Application Based on ISO/IEC 25010 and Analytical Hierarchy Process (AHP) by Nisrina Nurhuda, Eko Darwiyanto, Sri Widowati. In determining the priority characteristics of ISO 25010 with the AHP method, the sequence priority characteristics, namely Functional Suitability 24.9%, Usability 23.2%, Performance Efficiency 16.5%, Portability 13.5%, Compatibility 12%, and Maintainability 9.9%. Of the six characteristics of ISO 25010 greeting applications, functional suitability is characteristics that have the greatest influence on the quality of application software greetings because it has the highest level of importance compared to other characteristics with a priority level of 24.9%. [11]

IV. METHODOLOGY

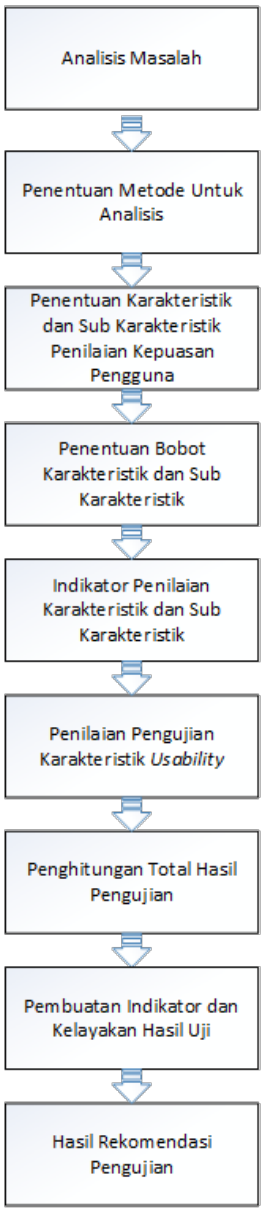

Figure 1. Stages of Research

The steps taken in the Electronically Integrated Business Licensing System research were carried out using the ISO 25010 method consisting of eight stages, namely problem analysis, determination of the ISO 25010:2011 method, determination of usability characteristics and sub characteristics , determination of usability characteristics and sub characteristics , characteristics

assessment indicators and sub-characteristics of usability, assessment of usability characteristics testing, calculation of total assessments, and recommendations for an electronically integrated business licensing system. In detail the stages of the research steps can be explained as follows:

A. Problem Analysis

At this stage it serves to analyze the problems contained in the Electronically Integrated Business Licensing System. The technical analysis used is direct observation and interviews at the Ministry of Investment and Downstream Industry / Indonesia Investment Coordinating Board in order to obtain objective and systematic data.

B. Determination of Methods for Analysis

At this stage, the determination of the method used to determine the quality of the Electronically Integrated Business Licensing System software is using the ISO 25010:2011 method. The ISO 25010:2011 method is a standard used by the international community to measure the quality of a software. ISO 25010 has eight characteristics to measure software quality as a whole. The eight characteristics include functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability (ISO 25000, 2020). [6]

C. Determination of Characteristics and Sub-Characteristics of User Satisfaction Assessment

The selection of usability characteristics is used to assess whether the system can be used by users in achieving certain goals in the form of effectiveness, efficiency and user satisfaction based on the assessment of the six sub-characteristics of usability, and can measure the quality of user experience from using the system and adopting a navigation system that makes it easier for users.

D. Determination of the Weight of Characteristics and Sub Characteristics

At the stage of determining the weight characteristics and sub-characteristics of the Electronically Integrated Business Licensing System using the Analytical Hierarchy Process (AHP) method. This weight determination uses web-based AHP tools with the url https://bpmsg.com/ahp/ahp-calc.php.
This web-based AHP tool is a tool for the decision-making process, on simple decisions or complex decisions. This web-based AHP tool is free.

E. Characteristics and Sub-Characteristics Assessment Indicators

Assessment of 6 sub-characteristic indicators as follows:

Table 1. Indicators sub-characteristic

Range	Criteria	Description
1	0-20% questionnaire eligibility tool	Strongly Disagree
2	Questionnaire eligibility tool 21-40%	Don't agree
3	Questionnaire eligibility kit 41-60%	Neutral
4	Questionnaire eligibility kit 61-80%	Agree
5	81-100% questionnaire eligibility tool	Strongly agree

F. Usability Characteristics Test Assessment

At this stage, an assessment is carried out through the calculation of usability characteristics and sub-characteristics, namely by conducting a test assessment using the JR Lewis questionnaire. Usability testing in this study used the JRLewis Computer System Usability Questionnaire (CSUQ).

G. Validity Test

The validity test serves to show the degree of accuracy between the data that actually occurs on the object and the data collected by the researcher (Sugiyono, 2017: 125). [13]

H. Reliability Test

In his book (V. Wiratna Sujarweni. 2014. SPSS for Research. Yogyakarta: Pustaka Baru Press. p-193) explains that the reliability test can be carried out simultaneously on all items or questions in the research questionnaire. [14]

I. Calculation of Total Test Result

At this stage, the calculation of the characteristics and sub-characteristics that has been done previously is carried out, then the result is the total value of the assessment of the characteristics and sub-characteristics.

J. Making Indicators and Feasibility of Test Results

Making indicators and feasibility test results as follows.

Table 2. Indicators of Achievement and Feasibility of Test Results

Range	Criteria	Information
1	Total Test Results 0.00-1.00	Strongly Disagree
2	Total Test Results 1.10-2.00	Don't agree
3	Total Test Results 2.10-3.00	Neutral
4	Total Test Results 3.10-4.00	Agree
5	Total Test Results 4.10-5.00	Strongly agree

K. Recommended Test Results

The last step is to provide recommendations based on the total value of characteristics and sub-characteristics that have been obtained.

V. RESULTS AND DISCUSSION

In the chapter on research results and discussions are carried out systematically and logically based on data that has been analyzed in the research methodology, to obtain recommendations from the electronically integrated business licensing system. At each stage relate to one another to determine the next step.

A. The Results of Determining the Weight of Usability Sub Characteristics Using the Analytical Hierarchy Process (AHP) Method

Priority weights generated for criteria based on comparisons between sub-characteristics in AHP

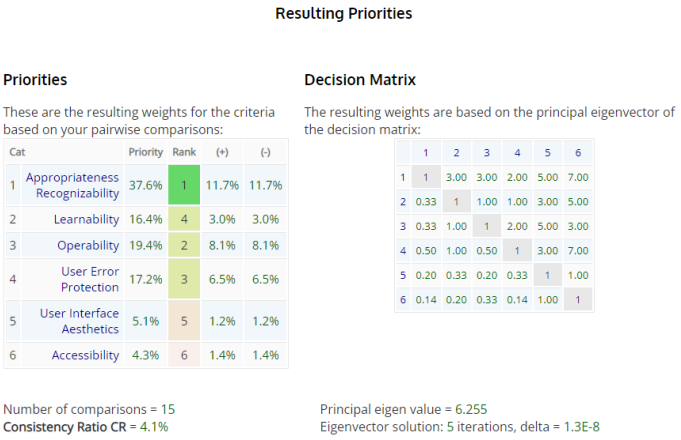

Figure 2. Consolidated Results of Usability Sub Characteristic

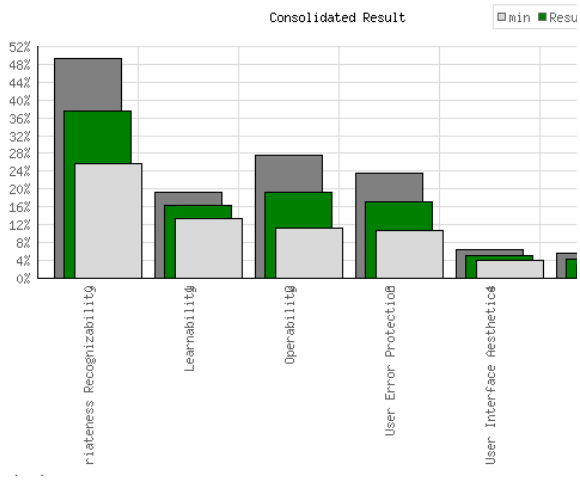

Figure 3. Consolidated Results of Usability Sub Characteristics

B. Validity Test Results Using SPSS Tools

In testing this validity using SPSS in the calculation process. The data entered into the SPSS is the score data using a Likert scale.

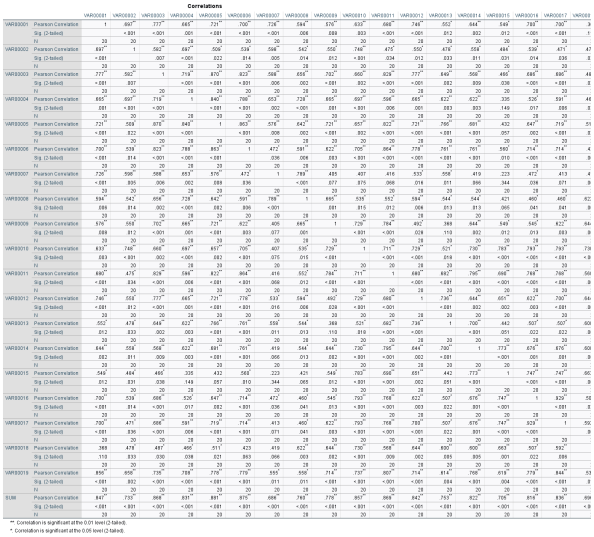

Figure 4. Validity Test Results

Based on the results of the validity test shown in Figure 4.8, the significance value of Sig. (2-tailed) if the value of Sig. (2-tailed) < 0.05 then there is a correlation between the variables that are connected, while the value of r count (Pearson Correlations) if the value of r count > r table then there is a correlation between variables. This study uses 20 respondents with a significance of 5% on the distribution of the statistical table r value, N = 20 (20-2 = 18). The distribution of the R value of the probability table of 0.05 is 0.468. Based on the results of the validation test for all items, it can be seen that the correlation of each question variable with the total score has a sig. < = 0.05, so H 0 is accepted. It can be concluded that each question item score is positively correlated with the total score or each questionnaire question variable is declared valid, because the Pearson correlation value coefficients or r count > r table.

C. Reliability Testing Results Using SPSS Tools

Reliability testing is to show the consistency of a measuring instrument as reliability or measurement accuracy.

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.969	19

Figure 5. Case Processing Summary

D. Usability Characteristics Test Results

Based on the results of the tests that have been carried out, the total value of each characteristic is obtained. Table 3 shows the total value of the six usability sub characteristics, namely: appropriateness recognizability,

learnability, operability, user error protection, user interface aesthetics and accessibility to the licensing system trying to be integrated electronically. The weight value obtained in the AHP calculation is multiplied by the value of the test results for each sub-characteristic, the total is the multiplication of the weight with the value. The results of the assessment of the usability sub characteristics can be seen in table 3.

Table 3. Total Value of Usability Characteristics

No.	Sub Karakteristik	Bobot	Nilai	Total (Bobot x Nilai)
1	*Appropriateness Recognizability*	37,6%	4	(0,376 * 4 = 1,504)
2	*Learnability*	19,4%	4	(0,194 * 4 = 0,776)
3	*Operability*	17,2%	4	(0,172 * 4 = 0,688)
4	*User Error Protection*	16,4%	5	(0,164 * 5 = 0,82)
5	*User Interface Aesthetics*	5,1%	5	(0,051 * 5 = 0,255)
6	*Accessibility*	4,3%	5	(0,043 * 5 = 0,215)
Total		100%		4,258

E. Recommended Test Results

Based on the results of research that has been carried out for testing the licensing system trying to be integrated electronically using ISO 25010 the Analytical Hierarchy Process (AHP) method, then an assessment of the six sub-characteristics of usability, namely appropriateness recognizability, learnability, operability, user error protection, user interface aesthetics and Accessibility obtained t total overall results of the six sub-characteristics obtained a value of 4.258 of the total value of 5 indicators of achievement and feasibility of the test results. So that the total criteria for the test results are included in the range 4.10 – 5.00 with very good information, it can be concluded that the overall licensing system seeks to be integrated electronically capable of carrying out all available functions and capabilities, effective and efficient in use, and has reliability on the user side.

VI. CONCLUSION AND FUTURE SCOPE

Research on Software Quality Analysis Using The Iso 25010:2011 Standard On The Online Single Submission System has been successfully carried out. In this study, usability characteristics are used. The stages carried out in the analysis of software quality in the licensing system are trying to be integrated electronically using the Analytical Hierarchy Process (AHP) method, then the IS0 25010 assessment of six sub-characteristics of usability, namely appropriateness recognizability, learnability, operability, user error protection, user interface aesthetics and accessibility. After getting the value for each sub-characteristic, then the calculation of the total results of the characteristic assessment.

The testing of the licensing system is trying to be integrated electronically using a questionnaire using the JR Lewis method, with 19 questions. The test results on the appropriateness recognizability sub-characteristics got a value of 1.504, the learnability sub-characteristic got a value of 0.776, the operability sub-characteristic got a value of 0.688, the user error protection sub-

characteristic got a value of 0.82, the user interface aesthetics sub-characteristic got a value of 0.255, accessibility sub characteristics get a value of 0.215. The total results of the six sub-characteristics obtained a value of 4.258, from 5 indicators of achievement and feasibility of test results, with the total criteria of test results ranging from 4.10 to 5.00 with very good information, it can be concluded that the overall licensing system is trying to be integrated electronically capable of carrying out all functions and capabilities that are available, effective and efficient in use, and have reliability on the user's side.

The results of the test recommendations show that the lowest rank obtained is on Accessibility of 0.215; therefore, it is recommended that the development of the electronically integrated business licensing system be provided with features in the form of information that is easily understood and effective in using the electronically integrated business licensing system, as well as additional information regarding the steps that need to be taken to overcome issues if problems occur during the data entry process of the electronically integrated business licensing system.

Suggestions for further research can be done by adding other tests such as functional suitability, performance efficiency, compatibility, reliability, security, maintenance, or portability of ISO 25010:2011 so that it can be comprehensive on the system. Another development is by increasing the distribution of questionnaires, so that the results obtained are more varied from user assessments of the electronic business licensing system.

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