

Quality Analysis of E-Office of the Ministry of Agrarian and Spatial Planning of the National Land Agency Method Using ISO 25010

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Abstract— Technological advances in government (e-government) provide an important role for the smooth sharing of information in a government. These activities simplify and speed up services, storage and access to the required information quickly and accurately. The Ministry of Agrarian Affairs and Spatial Planning of the National Land Agency which in its daily activities uses the e-office application as a tool in doing correspondence. The e-office system needs to be tested for the quality of the application. This is intended to ensure that the software produced is in accordance with previously determined requirements. The test was carried out using the ISO 25010 method with 7 characteristics, namely functional suitability, performance efficiency, compatibility, usability, reliability, maintainability and portability. Testing the e-office application using black box testing, stress testing and questionnaires. The test was successfully carried out with the results of the e-office quality test getting a value of 4.808 out of 5 because the e-office application is able to carry out all available functions and is easy to use and reliable.

Keywords— E-office, e-government, ISO 25010, black box testing, stress testing.

I. INTRODUCTION

E-Government in Indonesia has started since the time of President Megawati Soekarnoputri in 2003. INPRES No. 3 of 2003 concerning national policies and strategies for e-government development, instructs the government to take the necessary steps according to their respective duties, functions and authorities for the implementation of e-government development nationally by referring to the national e-government policy and strategy. One of the implementations of e-Government is office electronic applications (e-Office). In accordance with the Official Manuscript at the Ministry of Agrarian Affairs and Spatial Planning of the National Land Agency (ATR/BPN) which contains a uniform script within the Ministry of Industry, using e-Office.

Before the e-Office, correspondence still used manual, namely by recording correspondence from incoming mail, disposition by recording using an expedition book. Notes on the expedition book are still inadequate because when the book is lost it will be difficult to monitor the journey of the letter. E-Office was first applied to the Secretariat General of ATR/BPN in September 2019, then to other Echelon I ATR/BPN units in October 2019. At the Regional office level, e-office has been applied to the East Java Provincial BPN Regional Office, Regional Office Banten Province BPN, and Bali Provincial BPN Regional Office in November 2019 to

October 2020 and in 2021 the e-office of the Ministry of Agrarian Affairs. On November 8, 2020, e-office is implemented in work units throughout Indonesia at the Ministry of ATR/BPN. Document tracking that used to be done manually can now be done with just the touch of a finger. In addition, official documents will be integrated centrally. The development of e-Office at the Ministry of ATR/BPN created an Android and iPhone application to more easily monitor the correspondence called e-Office Mobile. The application is very adequate because of the helpful tools such as Attendance, Mailing, Civil Servant Dashboard, Online Meeting, Complaints, Holiday List and Tukin.

This e-office system needs to be tested for quality. This is intended to ensure that the software or software produced is in accordance with the needs of the Ministry of ATR/BPN. Software testing standards are very diverse, including ISO 25010. In this study, tests were carried out on the e-office application system at the Ministry of ATR/BPN using questionnaire data on employees of the Ministry of ATR/BPN, especially in the DKI Jakarta National Land Agency Office Area and system analysis using ISO 25010 on the characteristics of functional suitability, performance efficiency, compatibility, usability, reliability, maintainability and portability.

II. LITERATURE RIEVIEW

This research is divided into several stages to determine software quality. The stages are literature study, field study, questionnaire distribution, data collection, instrument testing, analyzing data and determining results as shown in Figure 1.

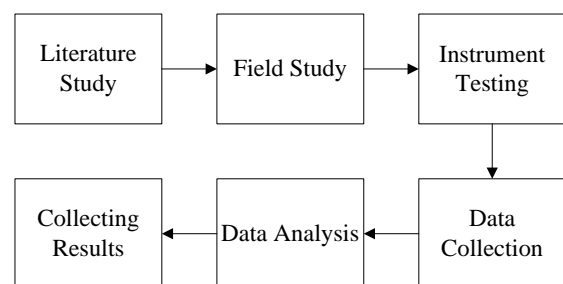


Fig. 1. Research Stages

a. Literature Study

Study is intended to reveal various theories that are relevant to the problems being studied thorough. The literature

study carried out was collecting a number of books, reading, studying, reviewing the literature related to e-office and journals, previous research related to research problems and objectives so that they could find out insights about ISO 25010.

b. Field Study

Activities carried out in the study field research is to conduct research after obtaining permission from the Ministry of ATR/BPN. At this stage, the aims and objectives of the research to be carried out at the Ministry of ATR/BPN are explained, namely observing the e-office application.

c. Instrument Testing Using ISO 2510

On At this stage, the instrument was compiled based on the ISO 25010 standard in the form of a list of JR Lewis questionnaire questions containing 19 questions according to the variables in ISO 25010. The instrument was in the form of a questionnaire using a Likert scale calculation with the following weighting answers:

Likert scale:

- a) 1 = Strongly disagree
- b) 2 = Less Agree
- c) 3 = Fairly Agree
- d) 4 = Agree
- e) 5 = Strongly Agree

The ISO 25010 method has 8 characteristics and 32 sub characteristics, while in this study only 7 characteristics and 24 sub characteristics will be used.

Determination of the characteristics and sub-characteristics of this study for testing e-office application software using 7 characteristics and 24 sub-characteristics. Characteristics and sub-characteristics are not used all because there are several sub-characteristics of the test that are not owned by the e-office application to be tested.

d. Data Collection

At the data collection stage, conducting direct observations at the Ministry of ATR/BPN to obtain the required data and distributing questionnaires to several employees using Google docs forms.

e. Data Analysis

After distributing the questionnaires, the collected data were grouped and analyzed. The results of determining the weight characteristics of the ISO 25010 model using the Analytical Hierarchy Process (AHP) method.

f. Collecting Results

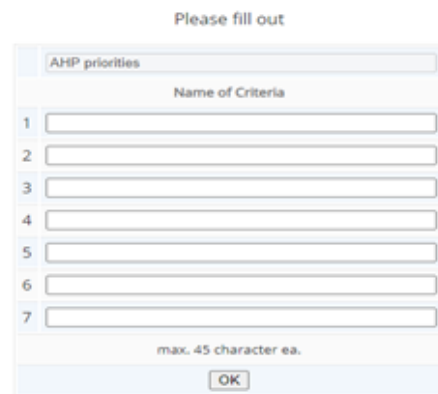
After the value of all aspects is known, there are conclusions and recommendations from the results of the questionnaire are also compiled in the form of conclusions. Conclusions on aspect values and recommendations are made with the aim that the quality of the e-office system at the Ministry of ATR/BPN can be maintained and improved.

III. RESULTS AND DISCUSSIONS

a. The results of determining the Characteristic Weights of the ISO 25010 Model Using the Analytical Hierarchy Process (AHP) Method

Characteristics that have been determined in the previous chapter are 7 characteristics, namely functional suitability, Performance Efficiency, Compatibility, Usability, Reliability, Maintainability and portability. Determination for the weight of the characteristics is to use the web-based AHP tools with the URL: <https://bpmmsg.com/ahp/ahp-calc.php>. Determination of characteristic weights can be seen in Figure 2.

AHP Criteria Names



Please fill out

AHP priorities

Name of Criteria

1

2

3

4

5

6

7

max. 45 character ea.

OK

Fig. 2. Determination of Characteristic Weights for ISO 25010 Model

Image above is the process of entering 7 characteristics of the ISO 25010 model using AHP. The seven characteristics that have been included are Functional suitability, Performance Efficiency, Compatibility, Usability, Reliability, Maintainability and portability as can be seen in Figure 3.

A - wrt AHP priorities - or B?		Equal	How much more?
1	<input checked="" type="radio"/> functional suitability <input type="radio"/> performance efesiency	<input type="radio"/> 01 <input type="radio"/> 02 <input checked="" type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
2	<input checked="" type="radio"/> functional suitability <input type="radio"/> compability	<input type="radio"/> 01 <input type="radio"/> 02 <input checked="" type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
3	<input checked="" type="radio"/> functional suitability <input type="radio"/> usability	<input type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input checked="" type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
4	<input checked="" type="radio"/> functional suitability <input type="radio"/> reability	<input type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input checked="" type="radio"/> 08 <input type="radio"/> 09	
5	<input checked="" type="radio"/> functional suitability <input type="radio"/> maintainability	<input type="radio"/> 01 <input type="radio"/> 02 <input checked="" type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
6	<input checked="" type="radio"/> functional suitability <input type="radio"/> portability	<input type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input checked="" type="radio"/> 09	
7	<input checked="" type="radio"/> performance efesiency <input type="radio"/> compability	<input type="radio"/> 01 <input checked="" type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
8	<input checked="" type="radio"/> performance efesiency <input type="radio"/> usability	<input type="radio"/> 01 <input type="radio"/> 02 <input checked="" type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
9	<input checked="" type="radio"/> performance efesiency <input type="radio"/> reability	<input type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input checked="" type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
10	<input checked="" type="radio"/> performance efesiency <input type="radio"/> maintainability	<input type="radio"/> 01 <input type="radio"/> 02 <input checked="" type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
11	<input checked="" type="radio"/> performance efesiency <input type="radio"/> portability	<input type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input checked="" type="radio"/> 09	
12	<input checked="" type="radio"/> compability <input type="radio"/> usability	<input type="radio"/> 01 <input checked="" type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
13	<input checked="" type="radio"/> compability <input type="radio"/> reability	<input type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input checked="" type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
14	<input checked="" type="radio"/> compability <input type="radio"/> maintainability	<input type="radio"/> 01 <input type="radio"/> 02 <input checked="" type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
15	<input checked="" type="radio"/> compability <input type="radio"/> portability	<input type="radio"/> 01 <input type="radio"/> 02 <input checked="" type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
16	<input checked="" type="radio"/> usability <input type="radio"/> reability	<input type="radio"/> 01 <input type="radio"/> 02 <input checked="" type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
17	<input checked="" type="radio"/> usability <input type="radio"/> maintainability	<input checked="" type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
18	<input checked="" type="radio"/> usability <input type="radio"/> portability	<input type="radio"/> 01 <input type="radio"/> 02 <input checked="" type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
19	<input checked="" type="radio"/> reability <input type="radio"/> maintainability	<input checked="" type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
20	<input checked="" type="radio"/> reability <input type="radio"/> portability	<input type="radio"/> 01 <input checked="" type="radio"/> 02 <input type="radio"/> 03 <input type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	
21	<input checked="" type="radio"/> maintainability <input type="radio"/> portability	<input type="radio"/> 01 <input type="radio"/> 02 <input type="radio"/> 03 <input checked="" type="radio"/> 04 <input type="radio"/> 05 <input type="radio"/> 06 <input type="radio"/> 07 <input type="radio"/> 08 <input type="radio"/> 09	

Fig. 3. Determination of Priority Factors 7 Characteristics

In the image above, after determining the priority factors of the 7 characteristics of software assessment based on the ISO 25010 standard, the next step is to determine the priority of each of these characteristics. Priority determination of the 7 characteristics is carried out based on a questionnaire to 10

employee respondents of the Ministry of ATR/BPN. The results of the recapitulation of respondents for the characteristics of ISO 25010 can be seen in Table I.

TABLE I. Number of Respondents Questionnaire Characteristics of ISO 25010

Question	1	2	3	4	5	6	7	8	9	0
In your opinion, how important is the factor <i>functional suitability</i> on a <i>website</i> to the following factors:										
<i>Performance Efficiency</i>			7	3						
<i>Compatibility</i>				5			4	1		
<i>Usability</i>			1				7	2		
<i>Reliability</i>							1	2	7	
<i>Maintainability</i>			6	4						
<i>Portability</i>						3			7	
In your opinion, how important is the factor <i>Performance Efficiency</i> on a <i>website</i> to the following factors:										
<i>Compatibility</i>		6			4					
<i>Usability</i>			8	2						
<i>Reliability</i>					5	4	1			
<i>Maintainability</i>			6	3	1					
<i>Portability</i>			2			1			7	
In your opinion How important is the factor <i>Compatibility</i> on a <i>website</i> to the following factors:										
<i>Usability</i>		8	2							
<i>Reliability</i>			2				7		1	
<i>Maintainability</i>			7	3						
<i>Portability</i>			9	1						
In your opinion, how important is the factor <i>Usability</i> on a <i>website</i> to the following factors:										
<i>Reliability</i>			7							3
<i>Maintainability</i>	8			1						1
<i>Portability</i>				1			6	3		
How important do you think? the importance of the factor <i>Reliability</i> on a <i>website</i> to the following factors:										
<i>Maintainability</i>	5			1						4
<i>Portability</i>		8	2							
In your opinion, how important is the factor <i>Maintainability</i> on a <i>website</i> to the following factors:										
<i>Portability</i>			1	8			1			

The results of determining the priority weights of the 7 characteristics of ISO 25010 based on Table obtained the resulting weights for the criteria based on the comparison between characteristics. The results of the determination of the characteristic weights can be seen in Figure 4.

Priorities

These are the resulting weights for the criteria based on your pairwise comparisons:

Cat		Priority	Rank	(+)	(-)
1	functional suitability	41.2%	1	15.3%	15.3%
2	performance efsiciency	21.3%	2	4.8%	4.8%
3	compability	15.1%	3	7.1%	7.1%
4	usability	7.7%	4	2.0%	2.0%
5	reability	4.2%	6	1.8%	1.8%
6	maintainability	7.7%	5	3.2%	3.2%
7	portability	2.9%	7	1.2%	1.2%

Fig. 4. The results of the determination of the 7 Characteristics of ISO 25010

In Figure 4 there are the results of determining the priority weights of the 7 characteristics of ISO 25010. The results of the seven characteristics are characteristics *functional suitability* in the position 1 with weight 41.2%, characteristics *Performance Efficiency* position 2 with a weight of 21.3%, characteristics *Usability* position 3 with a weight of 15.1%, characteristics *Compatibility* position 4 with a weight of 7.7%, characteristics *Reliability* positioned 5 with a weight of 4.2%, characteristics *Maintainability* 6th position with a 7.7% weight and portability characteristics in the last position with a weight of 2.9. The result with the highest number is the characteristic most needed for testing applications *e-office*.

TABLE II. Final Results of Determining the Weight of Characteristics and Sub-Characteristics ISO 25010

No.	Characteristic	Weight Characteristic	Sub Characteristic	Weight Sub Characteristic	Total
1.	Suitability	41.2%	Functional completeness	68.3%	100%
			Functional correctness	20.0%	
			Functional appropriateness	11.7%	
2.	Performance Efficiency	21.3%	Time behavior	61.5 %	100%
			Resource utilization	29.2%	
			Capacity	9.3%	
3.	Compatibility	15.1%	Co-existence	83.3%	100%
			Interoperability	16.7%	
4.	Usability	7.7%	Appropriateness recognizability	43.4%	100%
			Learnability	22.6 %	
			Operability	15.7%	
			User error protection	11.1%	
			User interface aesthetics	41.1%	
5.	Reliability	4.2%	Accessibility	3.1%	99.9%
			Maturity	54.0%	
			Availability	28.3%	
			Fault tolerance	12.9 %	
			Recoverability	4.7%	
6.	Maintainability	7.7%	Modularity	48.2%	100%
			ReUsability	31.9%	
			Analysability	15.2%	
			Testability	4.8%	
7.	Portability	2.9%	Adaptability	90.0%	100%
			Replaceability	10, 0%	

b. Final Results of Determining the Weight of Characteristics and Sub Characteristics Using the AHP Method

After performing the results of determining the weights of the characteristics and sub-characteristics of the ISO 2501 model in the e-office application, then calculating the final results of the weights of the characteristics and sub-characteristics of the ISO 25010 model. The sub-characteristics can be seen in Table II.

Table II is the result of calculating the weight of the characteristics and the weight of the sub characteristics using the ISO 25010 method. A total of 7 characteristics are given a weight of 100%, then the total of 100% is ut is divided by 7 characteristics that are used according to the needs of the software to be tested. In the total column, the total value of the sum of the sub-characteristics and characteristics if added up, the total weight of the 7 characteristics is at most 100%.

c. Results of Assessment of Total Characteristics and Sub-Characteristics Testing

After assessing the characteristics and sub-characteristics of the ISO 25010 model in the e-office application, the next step is to calculate the total of the characteristics and sub-characteristics of ISO 25010. The total calculation of the characteristics and sub-characteristics of ISO 25010 can be seen in Table III.

TABLE III. total Testing characteristics and sub characteristics

No.	Characteristics	Weight	Score	Total
1.	Functional Suitability	41,2%	5	0,412*5 =2,06
2.	Performance Efficiency	21,3%	4,627	0,213*4,627 =0,985
3.	Compatibility	7,7%	3,833	0,077*3,833 =0,295
4.	Usability	15,1%	4,889	0,151*4,889 =0,738
5.	Reliability	4,2%	5	0,042*5 =0,21
6.	Maintainability	7,7%	4,853	0,077*4,853 =0,373
7.	Portability	2,9%	5	0,029*5 =0,147
Total				4,808

The table above is the result of calculation of the total of the respective characteristics and sub characteristics. The table contains characteristics, weights, values and totals. The calculation of the total value of each characteristic comparison can be seen in the graphic image below.

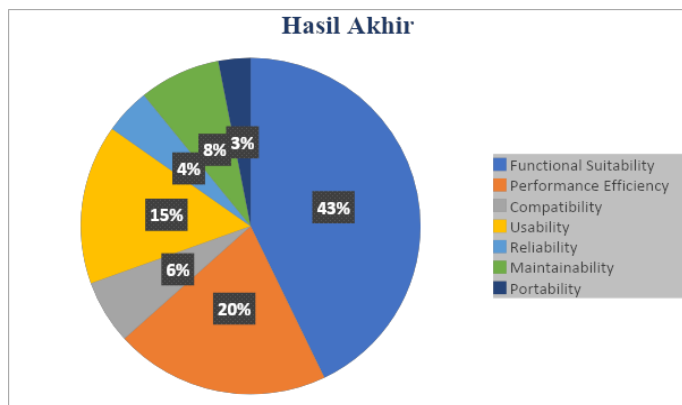


Fig. 5. Graph of Total Characteristic Testing

Figure 4 is a graph of the results of total characteristic testing. Based on Figure 4, the highest percentage is functional suitability of 43%, which means that these characteristics have a major effect on e-office applications. After evaluating the quality testing of the e-office application using the ISO 25010 method with 7 characteristics and 26 sub-characteristics using the blackbox testing model, stress testing and questionnaires, the results obtained based on Table 4.39 are the total assessment of e-office applications using ISO 25010 got a score of 4,808. This value is very good because it is only 0.192 less to achieve a perfect value according to the discussion of chapter 3 sub-characteristics.

IV. CONCLUSION

Testing the e-office application of the Ministry of ATR/BPN has been successfully carried out using the ISO 25010 method. The steps taken to test the quality of e-office applications using ISO 25010 are to determine the weight of characteristics and sub-characteristics using the Analytical Hierarchy Process (AHP) method. The other stage is the creation of indicators for assessing the sub-characteristics of the ISO 25010 model, assessing the characteristics of functional suitability, performance efficiency, compatibility, usability, reliability, maintainability and portability. After an assessment of each characteristic is carried out, it is continued to calculate the total results of the characteristic assessment. Testing the quality of e-office applications using the ISO 25010 method which tests with 7 characteristics and 25 sub-characteristics is carried out by the black box testing method, stress testing method and the JR Lewis questionnaire method. The highest total value after being calculated by weight, for the first position is the functional suitability characteristic with a total value of 2.06, the second position is performance efficiency with a total value of 0.985, the third position is compatibility with a total value of 0.295, the fourth position is usability with a total value of 0.738, the fifth place is reliability with a total value of 0.21, the sixth position is maintainability with a total value of 0.361, while the last position is portability with a total value of 0.147. The total score generated from all the tests that have been carried out is 4.808 out of a total value of 5 from the e-office application. That the e-office application is able to carry out all available functions, has reliability and the application is easy to use.

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