

Designing And Implementation Online Computer Based Testing System PKBM Riksa Ilmu Karawang

Yusnizar, Atit Pertiwi

University of Gunadarma, Department of Technology and Engineering, Software Information System, Indonesia
Karawang, Indonesia, 082218810404
bebyyusnizar@gmail.com

Department of Technology and Engineering, University of Gunadarma, Indonesia
Bekasi, Indonesia, 08176668357
atit.pertiwi@gmail.com

Abstract: The test is carried out as an evaluation material for learning outcomes conducted at the end of a certain period or at the end of a material. Along with the development of technology, the current manual or conventional examination system wants to be changed to a computerized test system or Computer Based Test (CBT). In this study the authors used the Computerized Fixed-Form Test (CFT) method. The SDLC Model used is a waterfall, design using UML. The applications used are XAMPP, Mysql, PHP, CSS. In CFT the questions given are randomized, but with a fixed amount. the CFT method is part of CBT. With the waterfall, each question has been conditioned on the levels of difficulty first, so that when inputted on a computer there is no more sorting based on the level of difficulty performed by the system. With the online test system (CBT), the testing process can take place quickly, the calculation of grades can also be displayed quickly, precisely and accurately. In the waterfall the process must be sequenced and cannot complete the next stage if the previous stage has not been completed. The most fundamental felt in the use of the Computer Based Test (CBT) system is the savings in the use of paper.

Keywords: CBT, CFT, UML, waterfall

1 INTRODUCTION

Another advantage can be obtained is the reduction in paper usage and the reduction in the form of error correction by humans (Michael, 2017) [1]. Online Test offers a very large scope for innovation in testing and assessment and measuring the characteristics of participants that are not possible by traditional methods [2]. Computer-based tests have the ability to automate time-consuming correction tasks, which are tests that can be used in unsupervised conditions [3].

2 LITERATURE REVIEW

A. Related Works

This research refers to a web-based online exam. The following is a summary of similar studies that have been carried out. This research is almost the same as what the author did, the weakness is that it still using a structured programming approach model such as data flow diagrams (DFD), using a combined method [1]. Measuring the degree of male and female adaptation to the use of CBT, requires large costs [2]. The lack is still using the structured programming model [3]. The blackbox method has a test definition based on test documentation, another name for this method is functional testing [4]. Computer-based testing systems that are available for implementation are proprietary systems and cost a lot of money to purchase and maintain. The cost of purchase has hindered some institutions from adopting computer based testing even though there is evidence that using computer based testing is better [5]. Institutions such as Obafemi Awolowo University, Ile Ife; National Open University of Nigeria (NOUN); Covenant University, Ota and University of Ilorin use CBT for their entrance examinations [6].

B. Testing

At this stage the authors try to test the website and online test. The test method chosen was the black box method and user acceptance test.

C. Login Admin Framework

Figure 1 is a picture of the admin login design in which the admin login can be input by three accounts. Admin account used for input all the data needed for the exam, the supervisor's account used for input the exam questions and answer key as well as see the results of the citizens learning exam.



Fig. 1. Login Admin

D. Home Admin Framework

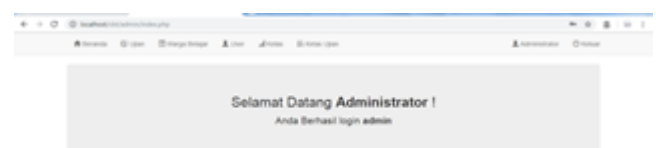


Fig. 2. Home Admin

3 PROPOSED METHOD

Web-based online test application research at the Center for Community Learning Activities (PKBM) Riksa Ilmu conducted is a type of applied research. In this study the theory of information systems development uses the System Development Life Cycle (SDLC) development method, namely the Waterfall model.

The steps in the waterfall model are as follows:

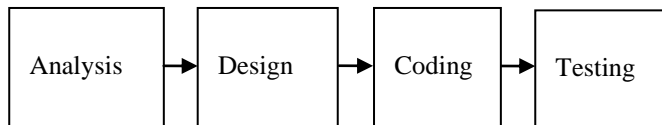


Fig. 3. Waterfall model

A. Software Requirements Analysis

Focus on digging up as much detailed information as possible about what applications are needed by the Center for Community Learning Activities (PKBM) Riksa Ilmu.

B. Design

The process of defining the model, methods and anything needed during the design of the application that will be made later, so that what is desired in accordance with the results designed.

C. Coding

The process of translating all models and modeling tools that have been designed into programming code.

D. Testing

Testing is done to determine and ensure that the application that we have designed can run according to function and is logically understood by the user.

4 RESULT AND DISCUSSION

After conducting the analysis, the website and online test application will be designed. At this stage there is a design using UML, database design and display design on the website. The diagrams used for the proposal are use case diagrams, activity diagrams and database systems. The research methods used include black box and user acceptance test.

E. Black Box Method

Focus on digging up as much detailed information as possible about what applications are needed by the Center for Community Learning Activities (PKBM) Riksa Ilmu. The blackbox method has a test definition based on test documentation, another name for this method is functional testing[4]

Table 1: Margin specifications

No	Testing Scenario	Expected Results	Conclusion
1	Login Process	Login data is correct or suitable, the application program notifies that the login is successful	VALID
2	Login Process	Login data input is incorrect or unsuitable, the application program notifies that the login failed.	VALID
4	Admin Menu Form	Running the edit and delete data command, the application displays the data can be edited / deleted	VALID
5	Test Menu Form	Do the exam questions correctly and the tools displayed are well understood, so there are no obstacles in the exam process	VALID
6	Logout Process	Exit the application program and display the logout notification successfully	VALID

F. User Acceptance Test (UAT) Method

To find out the response of respondents (users) to the online test application that will be implemented, then testing is done by giving 8 questions to 20 respondents (learning citizens) consisting of 510th class respondents, 5th grade 11 respondents and 10th grade 12 respondents where the answer to the question consists of levels that can be chosen as follows:

- A Very Easy / Good / Suitable / Clear
- B Easy / Good / Suitable / Clear
- C Neutral
- D Slightly Difficult / Bad / Unsuitable / Unclear
- E Very Difficult / Bad / Unsuitable / Unclear

TABLE 2. The Weight of the Answer Score

Answer	Score
A (Very Easy / Good / Suitable / Clear)	5
B (Easy / Good / Suitable / Clear)	4
C (Neutral)	3
D (Slightly Difficult / Bad / Unsuitable / Unclear)	2
E (Very Difficult / Bad / Unsuitable / Unclear)	1

TABLE 3. Questions and Answers

No	Question	Answer				
		A	B	C	D	E
1	Does this online test application look interesting?	9	6	5	0	0
2	Are these online test menus easy to understand?	10	7	3	0	0
3	Are the questions given in accordance with the material taught?	8	4	8	0	0

4	Does the online test make it easier to take the exam for learning citizen?	10	5	5	0	0
5	Does this online test application make learning citizens more excited about learning?	9	7	4	0	0
6	Is this online test application very useful to support teaching and learning activities at PKBM?	10	6	4	0	0
7	Can the application be used smoothly?	10	7	3	0	0
8	Is this online test application good enough?	7	8	5	0	0

	teaching and learning activities at PKBM?						
7	Can the application be used smoothly?	50	28	9	0	0	87
8	Is this online test application good enough?	35	32	15	0	0	82

The explanations of Table 3. and Table 4. will be explained below

Data that has been processed can be multiplied by each point answers with predetermined weights according to the weight of the answer score table. From the calculation results by multiplying each the weight of the answer score predetermined results obtained as follows.

TABLE 4. Data of Learning Citizen Questionnaire After Processing

No	Question	Answer					Answer
		A x 5	B x 4	C x 3	D x 2	E x 1	
1	Does this online test application look interesting?	45	24	15	0	0	84
2	Are these online test menus easy to understand ?	50	28	9	0	0	87
3	Are the questions given in accordance with the material taught?	40	16	24	0	0	80
4	Does the online test make it easier to take the exam for learning citizen?	50	20	15	0	0	85
5	Does this online test application make learning citizens more excited about learning?	45	28	12	0	0	85
6	Is this online test application very useful to support	50	24	12	0	0	86

Analysis of Question 1

1. From the table above it can be seen that the total value of 20 respondents for the first question is 84.
2. The average score is $84/20 = 4,2$.
3. The percentage score is $4,2/5 \times 100=84\%$

Analysis of Question 2

1. From the table above it can be seen that the total value of 20 respondents for the second question is 87
2. The average score is $87/20 = 4,35$.
3. The percentage score is $4,35/5 \times 100=87\%$

Analysis of Question 3

1. From the table above it can be seen that the total value of 20 respondents for the third question is 80
2. The average score is $80/20 = 4$
3. The percentage score is $4/5 \times 100=80\%$

Analysis of Question 4

1. From the table above it can be seen that the total value of 20 respondents for the fourth question is 85
2. The average score is $85/20 = 4,25$.
3. The percentage score is $4,25/5 \times 100=85\%$

Analysis of Question 5

1. From the table above it can be seen that the total value of 20 respondents for the fifth question is 85
2. The average score is $85/20 = 4,25$.
3. The percentage score is $4,25/5 \times 100=85\%$

Analysis of Question 6

1. From the table above it can be seen that the total value of 20 respondents for the sixth question is 86
2. The average score is $86/20 = 4,3$.
3. The percentage score is $4,3/5 \times 100=86\%$

Analysis of Question 7

1. From the table above it can be seen that the total value of 20 respondents for the seventh question is 87
2. The average score is $87/20 = 4,35$.
3. The percentage score is $4,35/5 \times 100=87\%$

Analysis of Question 8

1. From the table above it can be seen that the total value of 20 respondents for the eighth question is 82
2. The average score is $82/20 = 4,1$.

3. The percentage score is $4,1/5 \times 100=82\%$

4 CONCLUSION AND RECOMMENDATION

A. Conclusion

Based on the discussion of the results of the research discussed in the previous chapter, in the research of web-based online test information system design at the Center for Community Learning Activities (PKBM) Riksa Ilmu, the following conclusions can be drawn:

1. Producing an online exam web application in Teaching and Learning Activities Package C at the Center for Community Learning Activities (PKBM) Riksa Ilmu makes citizens more comfortable learning and easier to take the exam at a specified time.
2. Inputting the questions can be done quickly, precisely and accurately to make it easier for the supervisor.
3. There is an online examination correction facility.

B. Recommendation

Based on the results of the study, the implications and conclusions, the researcher can then provide some suggestions that are relevant to the results of the study. These suggestions are in the form of recommendations proposed to the research institution / object and for further research.

1. Data resource for making the questions should be taken from a question bank that can be made randomly, when presented in the form of questions. With the existence of a question bank that can be presented randomly, the questions done by the learning citizens will not be the same.
2. Data sources should no longer be stored in the form of Microsoft Excel, at least already using SQL, because Microsoft Excel is not included in a database groups.
3. The question bank must contain a lot, in order to avoid cheating on the questions that have been done, given the time the test lasts for 24 hours.

5 REFERENCES

- [1]. Michael Ajinaja, "The Design and Implementation of a Computer Based Testing System Using Component-Based Software Engineering," International Journal Of Computer Science And Technology, vol. 8, issue 1, ISSN: 0976-8491, 2017.
- [2]. Samy Garas and Mostafa Hassan, "Student Performance On Computer-Based Tests Versus Paper-Based Tests In Introductory Financial Accounting: UAE Evidence," Academy of Accounting and Financial Studies Journal, vol. 22, issue 2, 2018.
- [3]. Abdul Kareem Suleiman and Nathan Nachandiya, "Computer Based Testing (CBT) System for GST Exams in Adamawa State University, Mubi," Asian Journal of Research in Computer Science, 2018
- [4]. Srinivas Nidhra and Jagruthi Dondeti, "Black Box And White Box Testing Techniques –A Literature

Review," International Journal of Embedded Systems and Applications, vol. 2, NO. 2, 2012.

- [5]. O. Osunade, O. W. Omisore, O. O. Deji-Akinpelu and O. T. Olanrewaju, "Design and Implementation of an Online Computer-Based Testing System," African Journal of Computing & ICT Reference Format, vol. 11, No. 4, 2018.
- [6]. A.T. Alabi, A. O. Issa and R. A. Oyekunle, "The Use of Computer Based Testing Method for the Conduct of Examinations at the University of Ilorin", International Journal of Learning & Development, vol. 2, No. 3, ISSN: 2164-4063, 2012.