

Computer Assessment Test at the Association of Indonesian Independent Housing Experts with Waterfall Model

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Abstract. The Association of Indonesian Self-Help Housing Experts (PERAPSI) is a government organization that was just inaugurated in 2020 with an official certificate from the Ministry of Law and Human Rights of the Republic of Indonesia (KEMENKUMHAM) under the Directorate of Public Housing, Ministry of Public Works and Public Housing (PUPR). The Association of Indonesian Self-Help Housing Experts (PERAPSI) is tasked with directly gathering people in remote parts of the archipelago, an estimated 4,500 people who are not recorded by the Ministry of PUPR who are working on building self-help houses. For this reason, the Association of Indonesian Self-Help Housing Experts (PERAPSI) itself will record data and go through a process of data collection and assessment of people who are not recorded. The assessment process itself is through the Computer Assessment Test (CAT). The system development method used is the Waterfall method. Methods of Requirement Definition, System and Software Design, Construction, Deployment, which ends with support for the resulting software. With this designed system, it is a test with a computer in real time. This system can provide several advantages compared to the currently running system, namely efficiency and effectiveness in processing information and managing computer test data.

Keywords: *Assessment Test, Computer System, Model Waterfall, PERAPSI*

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INTRODUCTION

Humans are the most important element in the sequence of management implementation in an organization. In planning superior and quality human resources is the very first order function in an organization[1]. In HR planning is the action towards guaranteeing the right job forum, answered by various loads, positions and jobs at the right time. All of these achieve the goals and objectives to be defined. Therefore Recruitment is considered one of the most challenging functions of the job duties of the HR department to find professional staff[2]. The purpose of the recruitment that we apply is to speed up the examination process and get report results on exam selection, as well as to create standardized test results that have been determined and realize transparency, objectivity, table accounts with a high degree of accuracy. Of course, online prospects are very promising because more and more people are interested in using the internet to support their daily activities. Internet users in Indonesia in 2012 were 60 million people and in 2014 it is estimated to increase to 80 million people. Whereas in 2002 only 4.5 million people[3].

It is clear that the use of technology by using the internet greatly influences the way recruitment and testing is carried out in an organization [4]. so that it can make it easier to select human resources who have the abilities needed by an organization. Especially during the Covid-19 pandemic, more and more applicants are looking for jobs. If an organization or company opens job opportunities, so many applicants are enthusiastic about participating in the recruitment selection so that they can be accepted in an organization or a department, but the problem is in the HR department that selects so many applicants who follow while the number of HR or personnel departments that recruit very limited. Computer Assessment Test (CAT) as an answer can solve a problem in recruiting large numbers of applicants simultaneously to select applicants who only fit the criteria set by an organization. The implementation results show that the system with CAT is able to provide good transparency and objectivity[5]. In addition, CAT is also a form of support in reducing the use of documents such as paper in learning and evaluating both the question sheets and the material used [6].

In Technology improvement, tests in various fields, also improve quality, speed, practicality, and convenience. Examinations are also changed to obtain information, one of which is an online exam and Computer Assessment Test (CAT) [7]. Recruiting is a strategic management function. Through objective,

transparent and responsible recruitment, he hopes that the human resources needed in one hour can carry out professional tasks[8]. Recruitment should aim, as a screening process, at possible statistical tests related to integration and quality as well as quantity. excellence, through a recruitment process of transparency and responsibility[9]. One government organization that has implemented a computer-based selection system is the Association of Indonesian Self-Help Housing Experts (PERAPSI). The Association of Indonesian Self-Help Housing Experts (PERAPSI) is a government organization that was just inaugurated in 2020 with an official certificate from the Ministry of Law and Human Rights of the Republic of Indonesia (KEMENKUMHAM) under the Directorate of Public Housing, Ministry of Public Works and Public Housing (PUPR).

The Association of Indonesian Self-Help Housing Experts (PERAPSI) is tasked with directly gathering people in remote parts of the archipelago, an estimated 4,500 people who are not recorded by the Ministry of PUPR who are working on building self-help houses. For this reason, the Association of Indonesian Self-Help Housing Experts (PERAPSI) itself will record data and go through a process of data collection and assessment of people who are not recorded. The assessment process itself is through the Computer Assessment Test (CAT). The Computer Assisted Test (CAT) system itself must have an extraordinary security system so that it cannot be penetrated by hackers in Indonesia and in the world. CAT on a national scale and has a license, software quality that uses international standards for the development of the Computer Assessment Test system[10]. data processing that is still done manually can cause problems caused by manual systems, the system can enter in the form of data loss and the absence of existing data backups and cannot be known advantages and disadvantages, then with a computerized system it can be managed as well as possible to avoid data loss [14].Therefore, the Computer Assisted Test (CAT) system that we implement can make it easier for HR or personnel departments to select prospective employees who meet the standards set by an organization and make demands on the public for fair recruitment so as to produce professional staff.

METHODS

Application in this study, using the system development method, namely the Waterfall method. Methods of Requirement Definition, System and Software Design, Construction, Deployment, which ends with support for the resulting software. The stages with the Waterfall method can be seen in the stages below.

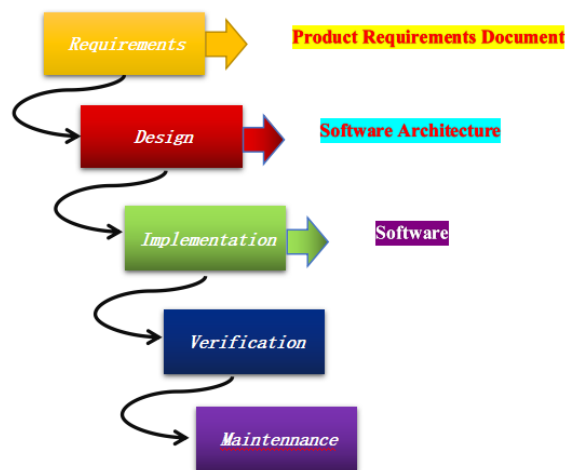


Figure 1. Waterfall

A. Requirement Definition

In the Requirement Definition stage, the application developer analyzes the needs to be used in planning. This application uses the Hypertext Preprocessor programming language, HTML, CSS, JS. By using a framework that will be used to modify it based on Object Oriented Programming with CodeIgniter (CI). With the text editor programming software using Visual Studio Code software. The database to be used is MySQL with the help of local database software, namely Appserv. Supporting software in making this

research is Microsoft Office 2019, Microsoft Project Plan, Microsoft Visio, Modellio, WinSCP, Adobe Experience.

B. System and Software Design

In System and Software Design, application developers will design the user interface and user experience for the application in their planning. System and Software Design uses the Unified Modeling Language programming design which consists of Class diagrams, Sequence diagrams, Activity Diagrams, Use case diagrams and Deployment diagrams. In planning the database using data flow diagram design, data relationship diagrams, learning management system.

C. Construction

Construction is the process of coding or coding which is a design translation into a language that can be recognized by a computer [11]. At the construction stage, this research will code which will use the Hypertext Preprocessor programming language, HTML, CSS, JS. By using a framework that will be used to modify it based on Object Oriented Programming with CodeIgniter (CI).

D. Deployment

At the deployment stage, this research will carry out a black-box trial process which will be carried out by several application reviewers consisting of company interns before application marketing will be carried out.

RESULT AND DISCUSSION

A. Requirements Analysis on Software

Analysis of System Requirements in the Use Case Diagram is as follows:

1. Analysis of the needs of the user
 - a. Prospective registrants can register online on the PERAPSI website and select registration from the menu. Furthermore, prospective applicants register first and then log in and fill out the registration form and upload all the registration requirements files needed as a condition.
 - b. Admins and registrars can see registered student data and can see confirmation to take the test by logging in to their respective rooms. Then the admin can manage the results by logging in to the admin menu.
2. System requirements analysis
 - a. The system provides several pages or forms on registration for prospective new registrants who want to register.
 - b. The system can provide information about registered candidates.
 - c. The system will check whether the username and password entered by the user are correct when logging in.

B. System Design

One of the most important things in a company's website is the company's employee recruitment process, this recruitment will be carried out in an online process through the company's website. The online process that will be carried out is uploading the necessary files such as curriculum vitae, diploma files, work experience files, certification files. Then it will be recorded and the next test process is usually done by the company offline working at the place of the company you want to apply for or coming directly to the place of destination such as civil servant recruitment. In addition, the increase in recruitment test technology in various fields also improves quality, speed, practicality and comfort. Examinations are also changed to obtain information, one of which is an online exam and Computer Assessment Test (CAT). Computer Assessment Test (CAT) for the absence of hackers or random people who enter will be given an official schedule, tokens to enter, and given the appropriate time so that the level of fraud will be minimized.

1. Use Case Diagram

Use case diagrams are diagrams that are used to briefly describe who uses the system and what they can do. The use case diagram does not explain in detail about the use of the use case, but only gives a brief description of the relationship between the use case, the actors, and the Image Usage system.

a. Use case Admin

The graphical image that shows several actor flows, use cases and interactions on the Admin menu is found in Figure 2.

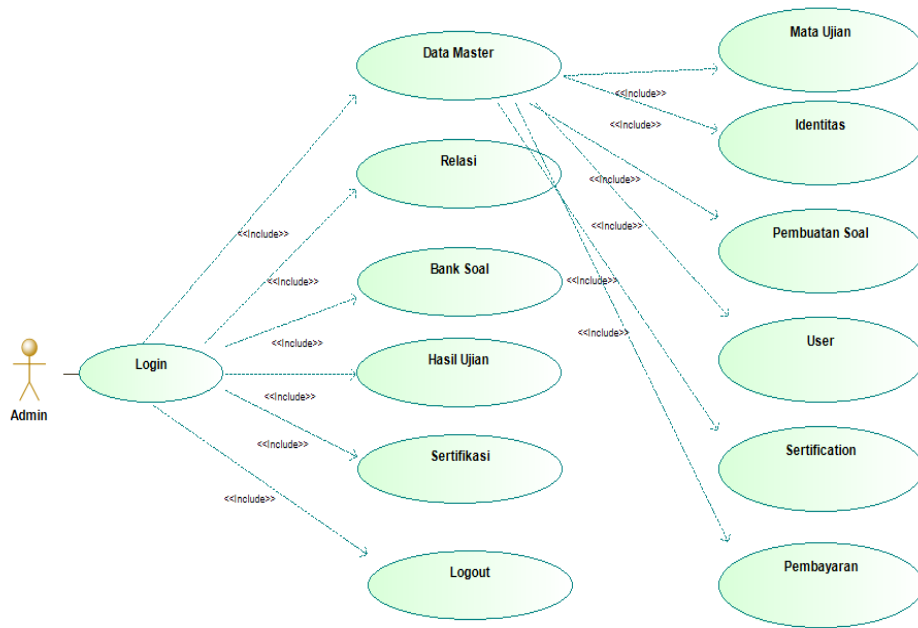


Figure 2. Use case admin

b. Question Creation use case

Graphical pictures showing several actor flows, use case diagrams and interactions in the question creation menu are shown in Figure 3.

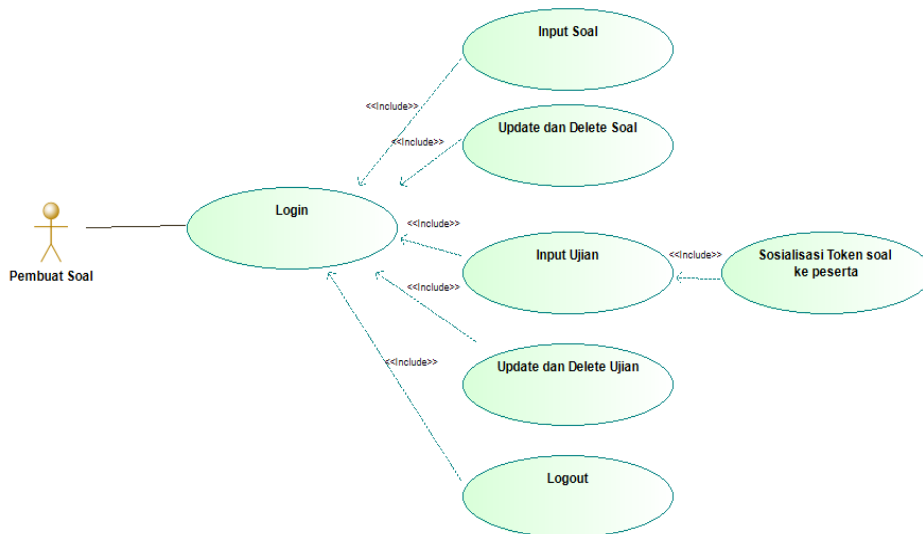


Figure 3. Question maker use case

c. Participant Use case

The graphical picture showing several actor flows, use case diagrams and interactions on the participant menu is shown in Figure 4.

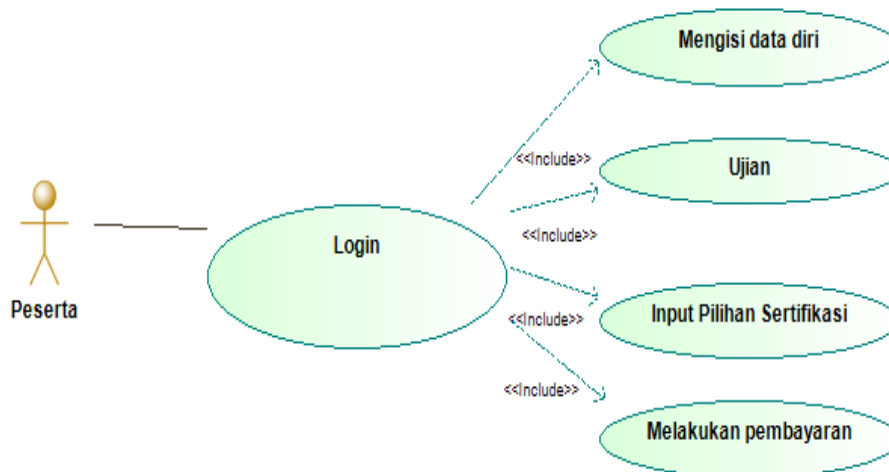


Figure 4. Participant use case

2. Deployment Diagram

Deployment diagrams are descriptions of the different processes in a running system and how the relationships are in them. This is what makes the user use the system that has been made and the diagram is static.

a. Registration Development Diagram

Development registration is used to describe and, specify, and document.

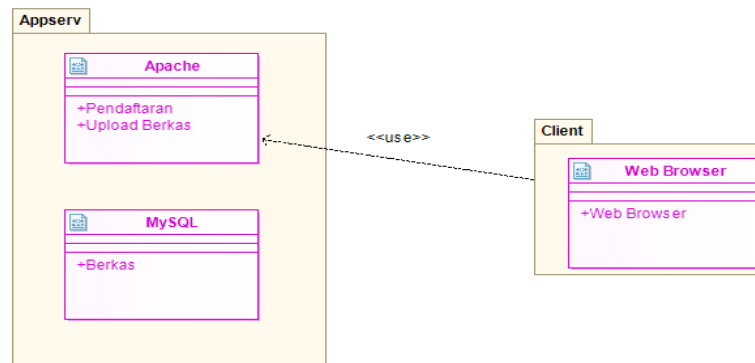


Figure 5. Registration development diagram

b. Development Diagram CAT

Development on CAT diagrams is used to describe and, specify, and document.

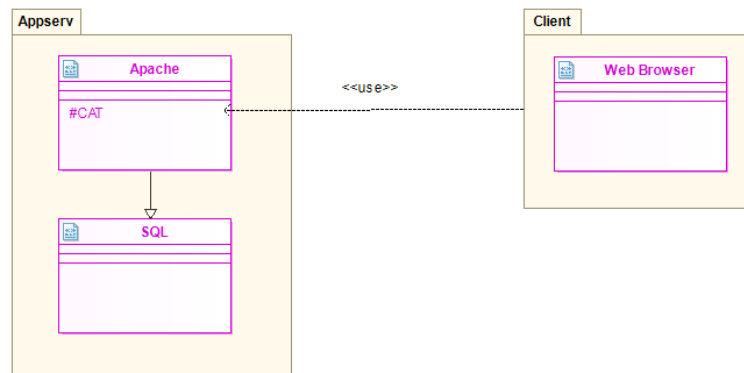


Figure 6. CAT development diagram

c. Certification Development Diagram

Development on the Certification diagram is used to describe and, specify, and document.

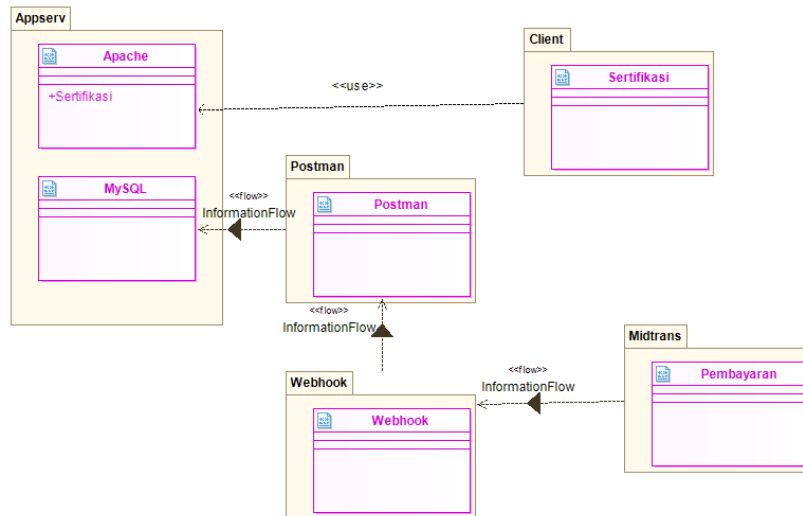


Figure 7. Certification development diagram

C. Desain User Interface

User Interface is a virtual media that can help in the use of an application that gives commands to a computer without having to type the command itself. Here are some graphical user interface images on the CAT.

1. Main Menu User Interface

Namely displaying the main menu on the registration of new candidates. Can be seen in figure 8.



Figure 8. Main menu

2. Candidate Account List User Interface

Namely displaying a menu on the account list for registration of new candidates who will take the exam. Can be seen in figure 9.

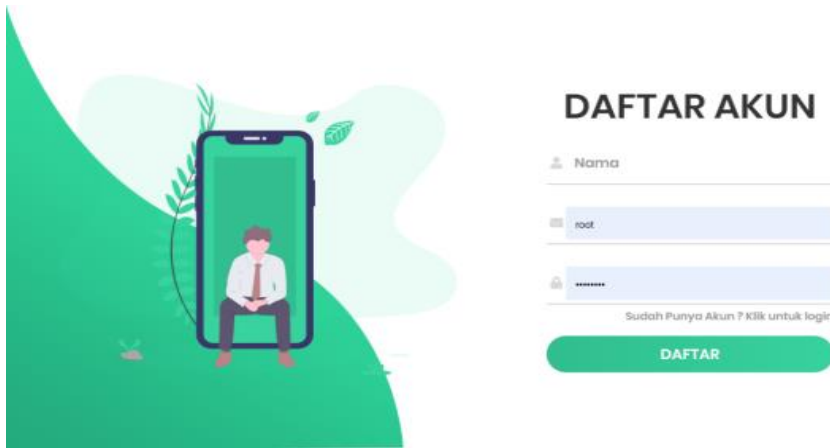


Figure 9. Account list

3. Participant Account User Interface Dashbord

Namely displaying a menu on the list of participant accounts for accounts that have been registered with CAT who will take the exam. Can be seen in figure 10.

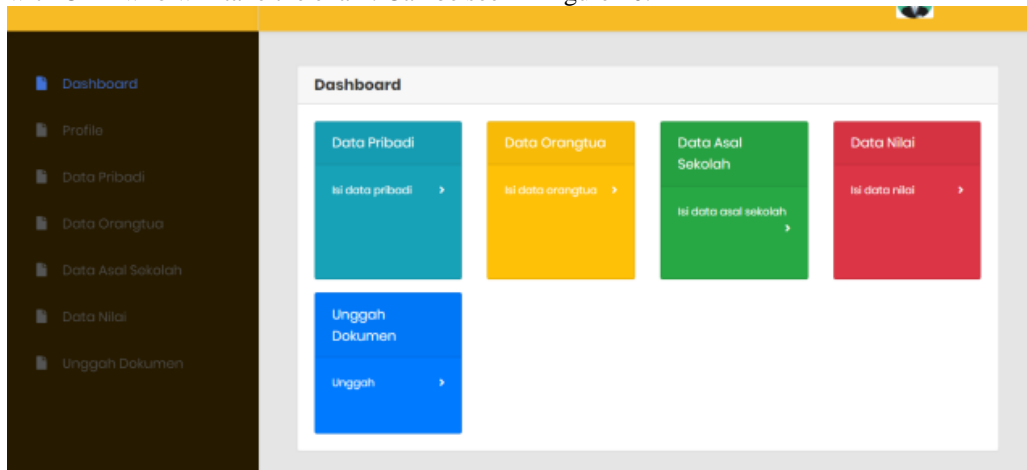


Figure 10. Participant dashboard list

4. User Interface Adminstrator

Namely displaying a menu on a list of all accounts that have registered with CAT who will take the exam. Can be seen in figure 11.

No Daftar	NAMA	ASAL SEKOLAH	TTL	ALAMAT	Bayar Di bank	Status	ID	Tgl Daftar	Tgl Bayar
1	Yogo Adi Saputra	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdfsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020
2	Yogo Adi Saputra	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdfsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020
3	Yogo Adi Saputra	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdffsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020
4	Yogo Adi Saputra	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdffsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020
5	Yogo Adi Saputra	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdffsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020
6	sdfsdff	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdfsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020
7	Yogo Adi Saputra	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdfsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020
8	Yogo Adi Saputra	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdfsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020
9	Yogo Adi Saputra	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdfsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020
10	sdfsdff	DMP NEORI 100 KINCOING	Jember.2020-12-31	sdfsdff	Bayar	Lupa	Asik	05 Feb 2020	05 Feb 2020

Figure 11. Administrators

5. User Interface Question Bank

Namely displaying the menu on the question bank that will be used in the CAT test that will take the exam. Can be seen in figure 12.

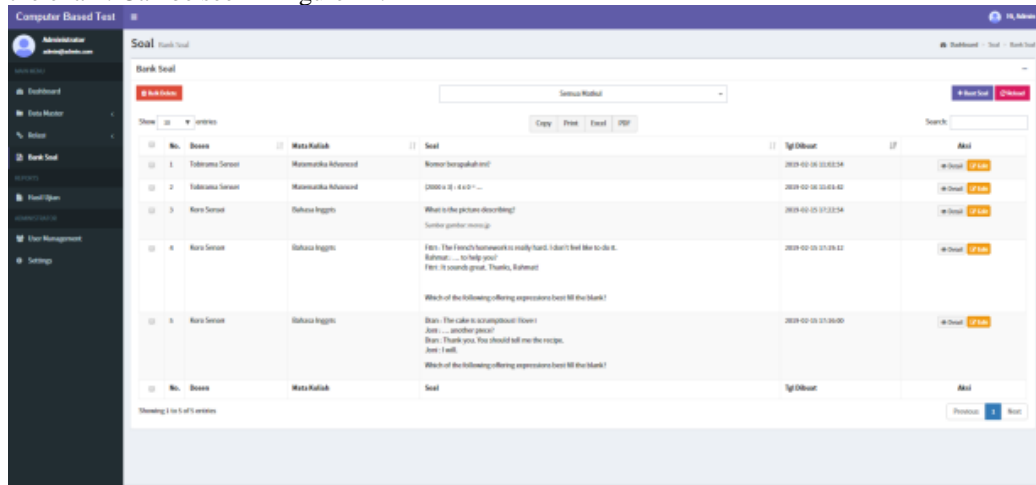


Figure 12. Question bank

6. User Interface Test Questions

Namely displaying a menu on the questions that will be used in the test with the CAT that will take the exam. The questions are taken from the Question Bank. Can be seen in figure 13.

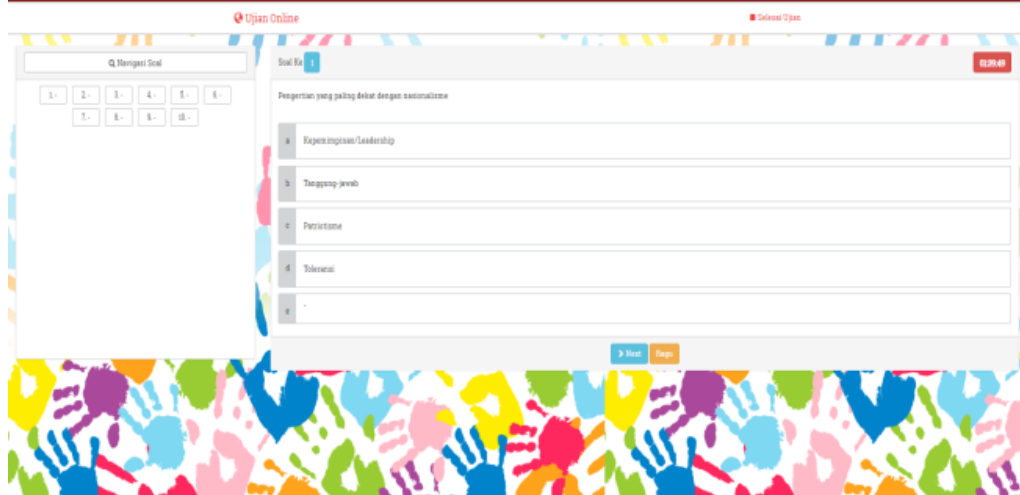


Figure 13. Exam questions

7. Exam results User Interface

Namely displaying a menu to find out the results of the test exam with a ranking system, the highest score in the top position. Can be seen in figure 14.

No.	First Name	Last Name	Username	Email	Level	Created On	Status	Action
1	Kiki	Sesun	33340576	kikesun@gmail.com	Admin	2020-02-15 17:24:46	Active	[Edit] [Delete] [Refresh]
2	Muhammad	Afandi	11183008	ngfataraf@gmail.com	Admin	2020-02-15 11:13:50	Active	[Edit] [Delete] [Refresh]
3	Subarna	Sesun	61214517	subarna@gmail.com	Admin	2020-02-15 10:55:54	Active	[Edit] [Delete] [Refresh]

Figure 14. Exam results

CONCLUSIONS

The design of the computer assessment test system on the appellant is the design of the running system. This designed system is a test with a computer in real time. This system can provide several advantages compared to the currently running system, namely efficiency and effectiveness in processing information and managing computer test data. With the existence of a computer assessment test system on this PERAPSI it can help make it easier for employees in the process of obtaining information and managing computer test data. In the next development stage, it is recommended for anyone who will continue to manage this computer test data to add facilities or a tool that supports the smoothness of the information process, such as adding adequate program facilities. In a system, there is a need for better development and improvement of the CAT system that has been made, so that the system can keep up with the times that are changing rapidly.

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