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Multidimensional in Integrated Islamic Schools Based on Web Technology: Integration of Al-Qur'an Learning Modules and Daily Activities

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Abstract **Currently, the manual system of report card assessors is no longer considered adequate for handling the workload. The process of assessing student grades on SDIT Anak Sholeh Mataram report cards which still uses conventional methods causes the assessment service process to be less than optimal. Therefore, to overcome these difficulties, a web-based e-report information system was designed using the PHP programming language and using the MySQL database to process report card filling data. This web-based e-report is not only used to fill in academic grades but there are other assessments that can be used, namely assessments in the context of tahfiz and tahsin and assessing students' daily activities. The method used in web development this web-based e-report information system is the rapid application development (RAD) method with several stages of needs analysis, system design, coding and testing, program implementation, and maintenance. This method is used because it can shorten the time in developing an information system than traditional methods. Based on the questionnaire with 10 questions given, there were 78% who agreed with the creation of the application.**

Key words**: Rapid Application Development, E-Report, Web Development, Information System**

I. INTRODUCTION

The development of information technology has brought significant changes in various aspects of life, including in the management of report cards. Report cards are one of the important tools in the world of education that function as written reports on student development and achievement over a certain period of time. In addition, report cards are also a means of providing feedback to students and parents about their performance at school. However, report card assessments in certain areas still use manual systems in processing report card value data and other services. This often causes data inaccuracy, difficulty in searching for student grades, and slow service processes.

Based on observation SDIT Anak Sholeh Mataram is one of the educational institutions with elementary school level in Pagesangan Village, Mataram District, Mataram Regency, West Nusa Tenggara, which was established in 2006. In carrying out its activities, SDIT Anak Sholeh Mataram is under the auspices of the Ministry of Education, Culture, Research and Technology.

The report card filling system in several schools still uses a manual system or the report card grades are filled in independently by the teacher concerned in handwriting. While now, the manual report card system is no longer considered adequate for handling the workload. The report card assessment process that still uses conventional methods causes the report card filling process to be less than optimal.

The development of technology means that the processing of report card administration must be concise, safe and valid. According to the Director of Elementary School Development, Directorate of Elementary and Secondary Education, Ministry of Education and Culture, Khamim, at the Ministry of Education and Culture Office, Jakarta, Friday, November 22, 2019. He said that the implementation of e-report cards was carried out in stages. There are around 2,000 out of 148,000 elementary schools that will implement e-report cards next year. Based on this, there are still many schools that have not implemented the e-report card system. In addition, the lack of accuracy because the system is not yet computerized is also one of the factors that hinders and complicates the management of student data and grade data.

E-report information system is built based on the web which aims to enable teachers in managing assessment data, the system can be accessed anytime and anywhere. In addition, the web-based report information system can also facilitate and assist teachers in filling in student grades.

In designing the information system, the researcher used the Rapid Application Development method. This method is used because it can shorten the time in developing an information system than traditional methods [2].

Rapid Application Development (RAD) is a linear sequential software development process that prioritizes short development cycles. RAD uses an iterative method in developing a system where a working model (working model) of the system is built in the early stages of development with the aim of determining user needs (requirements) and then being removed [15].

The RAD method offers various advantages in developing r-report information systems:

- Fast launch time. By using iteratively developed prototypes, RAD allows the delivery of usable software components in a shorter time.
- High user involvement. Users can provide continuous feedback during the development process, which helps produce a system that is more suited to their needs.
- Reduces redevelopment time. Because the system being developed is more targeted from the start, the need to make major changes after implementation can be minimized, so that the development process becomes more efficient [3].

The RAD method can be applied in developing e-report information systems for several reasons:

- Structured stages. RAD has clear and systematic stages, which simplify the development process.
- Short development cycle. RAD emphasizes a fast development cycle, allowing software components to be tested and implemented immediately.
- User feedback. The RAD development process involves users directly, with ongoing feedback to identify and fix problems early on.
- Reduced redevelopment time. By understanding user needs early on, RAD can reduce the likelihood of major changes after implementation, thereby speeding up system completion [4].

Information systems are systems consisting of integrated humans, hardware, software, procedures, and data. This system is used for automated report management so that it packages valuable information for its users [5].

Based on the problems presented, this report information system was created with the hope of being able to help and establish cooperation with schools that have difficulty in filling in grades, especially in schools located in remote areas of the village. It is hoped that this system can be implemented widely in various other regional schools as an effort to improve services and management of student grade data.

The proposed solution to solve the current problem is the creation of an Information System that can manage Web-based Report Card Administration and Assessment to provide convenience to SDIT Anak Sholeh Mataram.

II. Literature Review

Research on the e-report system has been conducted previously in previous studies.

This Literature Review is a study of related literature and research from e-report systems that have been conducted in other areas so that it becomes the basis for creating this system.

According to a study conducted by Windarti (2024), a web-based e-report information system can help teachers optimize the management of student grades. This system allows teachers to search for student data, check student grades, and fill in and print report cards. Thus, the implementation of this system is expected to improve the quality of service and user satisfaction [5].

According to a study conducted by Hidayat (2021) This online report card information system can help in the processing and archiving of report card data, namely: school data, teacher data, homeroom teacher data, student data, academic data and student grades. And simplify the processing of report cards that previously used a manual process using the excel application [6].

Research related to the information system for processing student grades at SD Al-Hidayah Tangerang which provides facilities to facilitate the process of processing and searching student data, attendance, grade data and overall reports requested by the principal, so that it does not take up much time. The stages of developing a student grade data processing application using the Waterfall method [8].

Research related to the information system for processing student grade data at SD Negeri 164 Pekanbaru provides facilities to facilitate the process of creating a new system, so that processing student grade data can be done quickly, precisely and accurately. The stages of developing an information system with the System Development Life Cycle approach [9].

Research related to the student grade data processing information system using agile method provides facilities to facilitate the process of users have different levels. This website can help and simplify the process of filling out the report card and taking the report card itself [11].

Research related to the student grade data processing information system using rapid application development which provides facilities that facilitate the processing of student grades, school information related to academic or non-academic activities [10].

The RAD method is a system development method that emphasizes speed in the application creation process. RAD allows application development by involving users in every stage of the process, so that the final result can be more in line with their needs. In research related to the E-Report information system, the RAD method is very suitable for use because the process is iterative and can produce prototypes in a short time [3].

The application of the RAD method in this context is considered relevant because it can facilitate rapid adjustments to the needs of teachers, especially in responding to the filling of diverse values. In addition, RAD allows teachers to be directly involved in the system development process, so that each module developed is in accordance with actual needs in the field.

The web-based e-report information system has advantages in terms of accessibility and ease of managing data online. Previous research has shown that a web-based system provides advantages because it does not require application installation on the user side, simply by using an internet browser. This is in line with the needs of schools in the digital era which require a system that can be accessed anytime and anywhere [7].

From the related literature review, the analysis in this study shows that RAD is considered superior to Waterfall because of its flexibility in rapid iteration and high user involvement. And compared to Agile, RAD is more structured and directly oriented towards making testable

prototypes, making it very suitable for the development of a web-based e-report system that requires a quick response to user needs.

In contrast to previous research which only focused on the academic value filling system. This article does not only focus on the academic assessment system but also adds another assessment system, namely the tahfidz and tahsin assessment system and the assessment system for students' daily activities, which has not been done in previous literature.

III. Research Methodology

This study uses RAD which consists of four main stages. The first stage is requirement planning, where user needs analysis is carried out through interviews and observations. The second stage is prototype design, where a system prototype is created based on the results of the needs analysis. The third stage is construction, where system development is carried out based on the approved prototype. The fourth stage is implementation, where the system that has been developed, tested and trained for users [2]. The RAD method is applied in the development stages of the web-based e-report information system. The RAD approach was chosen:

- Focus on rapid prototyping with live coding.
- Short iterations, fast feedback from users.
- No need for complete documentation, as long as the work can be tested quickly.

The stages of RAD implementation in this study are as Figure 1.

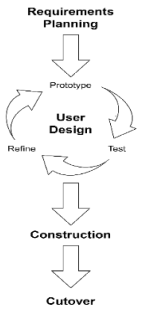

Fig. 1. Method Rapid Application Development

A. Requirements Planning

Requirements Planning or project requirements usually contain everything that must be achieved in a project and strategies for dealing with problems that may arise [12].

This section describes the functional requirements of the software, accompanied by a depiction of the Use case diagram related to the report card processing process required. The first step in the RAD method is to understand the needs of users and the system. In the research stage, data collection techniques interview and observation aim to:

- Identify user needs (homeroom teachers, admins).
- Determine the scope of the system.
- Agree on the main features of the e-report system.

A.1. Use Case Diagram

In this section, the researcher aims to determine who can access the e-report information system and what functions can be used by users. In the development of this information system, there are several changes that occur, such as the role of the homeroom teacher in the system, which previously could only access the value filling section, changed to being able to access other sections. There are also additional sections such as adding assessment values for each subject. So that the results are obtained as in Figure 2 there are two users, namely the school admin and the homeroom teacher. users are required to log in first to access other functions.

A.1.1 School Admin:

- Login: Admin enters the system.
- Access Homepage: Display the homepage.
- Manage data master: Add, delete, or change data such as students, teachers, subjects, school years, classes, assessment types, and activities outside the classroom
- Manage students' assessment reports: Add, delete, view, or print student assessment reports.
- Manage report card grade filling: Add, print, or delete report card.
- Manage user: Add, edit, or delete user.

A.1.2 Homeroom Teacher:

- Login: Homeroom teacher enters the system.
- Access Homepage: Display the homepage.
- Manage students' assessment reports: Add, delete, view, or print student assessment reports.
- Manage report card grade filling: Add, print, or delete report card.
- Manage user: Edit user.

Fig. 2. Use Case Diagram e-report.

A.2 Functional and Non-Functional Requirements

Functional needs are needs that contain any processes that will be carried out by the system. While non-functional

needs are needs that emphasize the behavioural properties owned by the system [14].

At this stage, the researcher designed several functional and non-functional needs from the school. During the implementation, there were several provisions that were changed, such as adding an import function to make it easier to manage data and adding several features in terms of assessment. which finally obtained the desired result.

A.2.1 Functional Requirements

- Users can view registered data such as class data, student data, teacher data and other data.
- The system can register an account through the admin.
- The system can log in by entering the username and password that was created previously.
- The system can store personal data as an admin or homeroom teacher.
- Users can carry out the process of filling in report card grades.
- The system can perform the data addition process.
- The system can perform the process of changing or deleting data.

A.2.2 Non-Functional Requirements

- Homeroom teachers cannot create their own accounts.
- Users can only enter data with a certain character limit.

B. User Design

Based on the results of the needs analysis, the researcher designed an initial prototype that objective:

- Designing system interfaces.
- Arranging system workflows based on use cases.
- Building rapid prototypes → user testing → revision → validation.

B.1. Prototype

An initial model or representation of a product or design created to test the concept, function, and form of the product before mass production.

At this stage, design the initial UI, navigation flow, and interactive simulations.

B.1.1. Activity Diagrams

An activity diagram is a flow of system activities designed based on the use cases that have been created. The activity diagram depiction is made based on the actors involved in the system, namely, School Admin and teachers. Activity diagrams describe the various activity flows in the system being designed, how each flow begins, user decisions that may occur, and how they end.

B.1.1.1 Activity Diagram Managing Student Data

As the figure 3 explains the flow of the activity diagram managing student data. Activity Diagram managing student data describes what the admin does to manage student data, which includes the activity of displaying student descriptions, as well as adding, changing, and deleting student data.

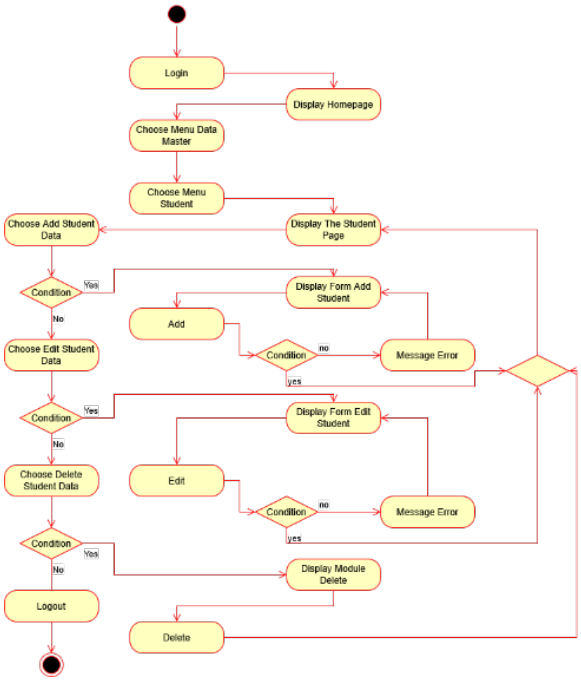

Fig. 3. Activity Diagram Managing Student Data.

B.1.1.2 Activity Diagram Managing Assessment Report

As the figure 4 explains the flow of the activity diagram managing assessment report. Activity Diagram managing assessment report data describes what the admin or homeroom teacher does to manage assessment report data, which includes the activity of displaying assessment descriptions, as well as adding, changing, and deleting assessment data.

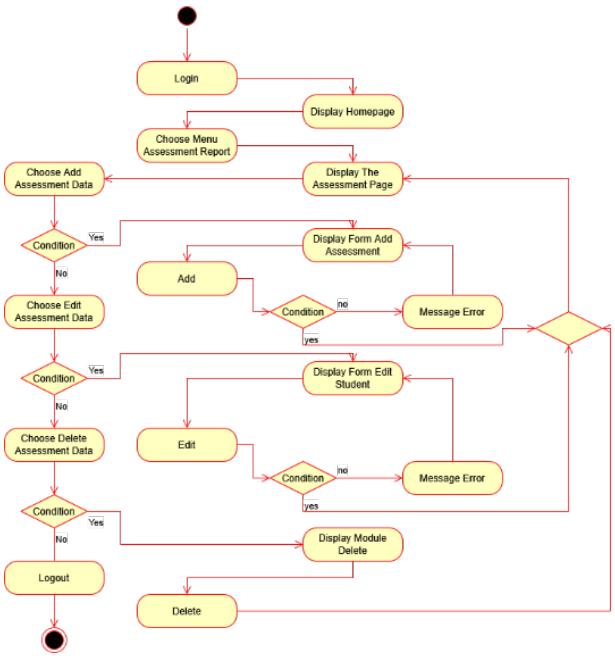

Fig. 4. Activity Diagram Managing Assessment Report.

B.1.1.3. Activity Diagram Managing Report Card Grade Filling

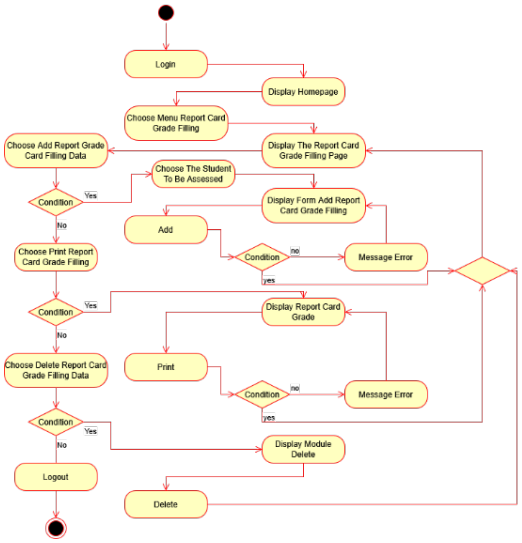

Fig. 5. Activity Diagram Managing Report Card Grade Filling Data.

As the figure 5 explains the flow of the activity diagram managing report card grade. Activity Diagram managing report card grade filling data describes what the admin or homeroom teacher does to manage report card grade filling data, which includes the activity of displaying report card descriptions, as well as adding, printing, and deleting report card grade filling data.

B.1.1.4. Activity Diagram Managing Report Card Tahfiz Grade Filling

As the figure 6 explains the flow of the activity diagram managing report card tahfidz grade filling. Activity Diagram managing report card tahfiz grade filling data describes what the admin or homeroom teacher does to manage report card tahfiz grade filling data, which includes the activity of displaying report card tahfidz descriptions, as well as adding, printing, and deleting report card tahfidz data.

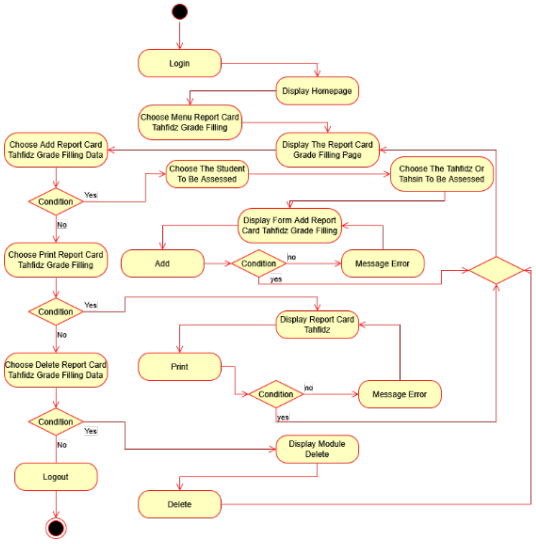

Fig. 6. Activity Diagram Managing Report Card Tahfiz Grade Filling Data.

B.1.2. Navigation Structure

A navigation structure is a framework or system that organizes elements within an application or website so that users can navigate easily.

This step, design navigation structure of e-report at SDIT Anak Sholeh Mataram. As a figure 7 navigation structure in e-report SDIT Anak Sholeh Mataram at first is login page, after user login user will be directed to homepage. At the homepage user can access another page.

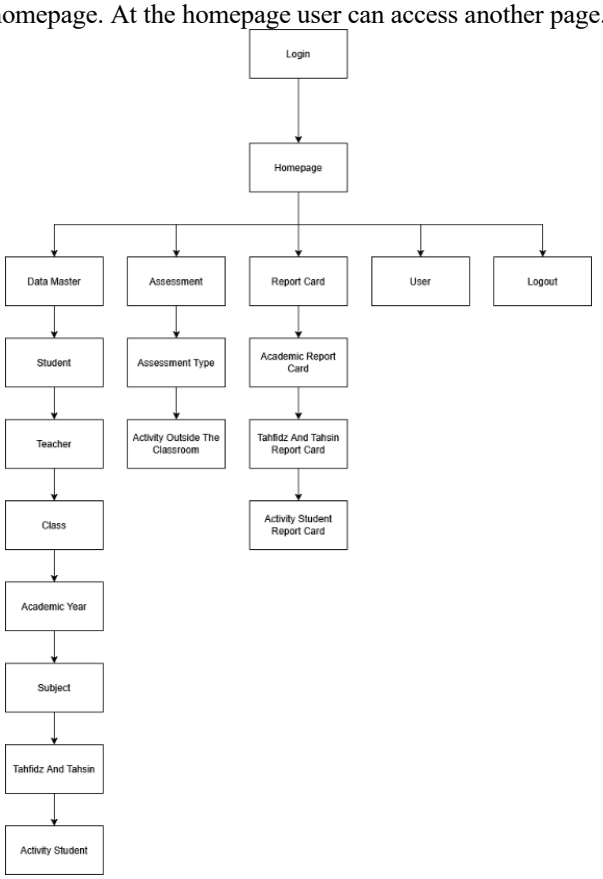

Fig. 7. Navigation Structure E-Report.

B.1.3. Wireframe

A basic visual representation (usually a sketch or blueprint) of the structure of a web page or application, focusing on layout, navigation, and user flow, without visual details such as colour or typography. At this step, design a wireframe of e-report at SDIT Anak Sholeh Mataram.

B.1.3.1 Wireframe Login Page

As figure 8 design wireframe login page there an image of logo SDIT Anak Sholeh Mataram, input value there are username and password, and button login if button clicked to be moved to homepage.

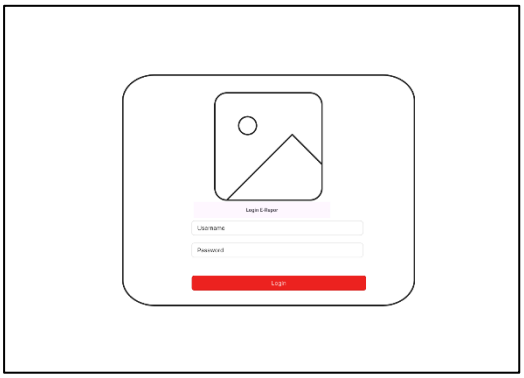

Fig. 8. Wireframe Login Page.

B.1.3.2. Wireframe Homepage

As figure 9 design the wireframe homepage there seven menus in left section. In homepage there a information of SDIT Anak Sholeh Mataram.

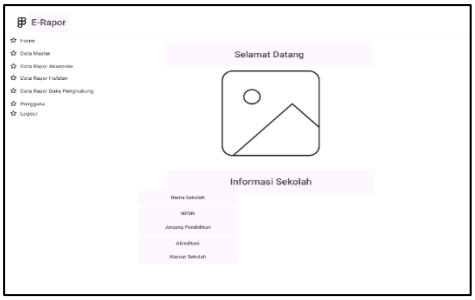

Fig. 9. Wireframe Homepage.

B.2. Testing

at this stage, testing was carried out on the admin and homeroom teachers. at this stage there were several reviews such as:

- "There is no import feature in some data entry"
- "There is no calculation to find the average value on the report card value"
- "There is no SDIT Anak Sholeh Mataram logo"

B.3. Refine

At this stage improvements are made based on previous reviews. there are changes to the e-report information system such as:

- Adding import features to several data entries
- Adding auto-calculation to the final report card grades
- Adding the SDIT Anak Sholeh Mataram logo to the login page and the main page containing school information

C. Construction

Construction is a stage in RAD where developers work directly with users, create final designs, build and test prototypes. The output of this stage is documentation and instructions that are important for operating new applications and procedures needed for the system to operate.

At this stage, the author begins to create a planned system by compiling program code or coding, to change the system design that has been created into a planned application so that it can be used. The application created uses PHP for the programming language, MySQL for the database and Visual Studio Code as a tool that helps create the information system.

C.1. Physical Data Modelling

Database design at the concept level is a design that describes the interactions and relationships between entities in the system using a Physical Data Modelling (PDM). The following is a depiction of a PDM. As figure 10 there are fifteen database tables, some of which have relationships between other tables.

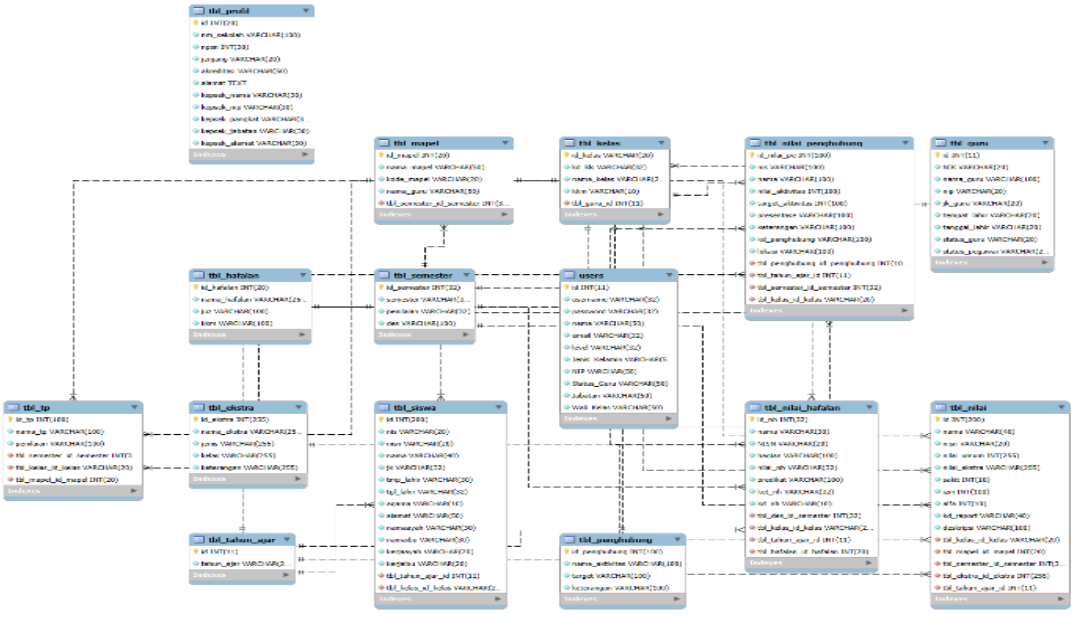

Fig. 10. Physical Data Modelling E-Report.

D. Cutover

This stage is the stage of testing the entire system that is built. All components need to be tested thoroughly. In this study, testing was carried out using black box testing, where this test is more focused on the Outer Appearance (interface) of an application so that it is easy for Customers to use. Black box testing works by ignoring the control structure so that its attention is only focused on domain information.

After all modules are tested and approved by users, the system will be fully implemented in SDIT Anak Sholeh Mataram.

- Training is provided to admin staff and teachers to ensure they understand how to use the system.
- Final evaluation is conducted through user interviews and observations to measure the effectiveness of the system in improving efficiency in filling in student grades.
- The study will also record feedback from users during the implementation stage for future development plans.

Each stage of RAD reflects an iterative cycle coloured by active user involvement, especially in providing feedback that forms the basis for the development of the next prototype. The results of this study are expected to produce an e-report information system that is efficient, easy to use, and in accordance with the needs of teachers at SDIT Anak Sholeh Mataram [4].

D.1. Application Installation

At this stage, before conducting testing on the user side, the author installed the application on SDIT Anak Sholeh Mataram.

D.2. Testing

At this stage, initial testing is carried out on the application used by the admin of SDIT Sholeh Mataram. This testing only focuses on the function of the application without assessing the form of the interface. As figure 11 initial testing has been carried out at SDIT Anak Sholeh Mataram by the school administrator.

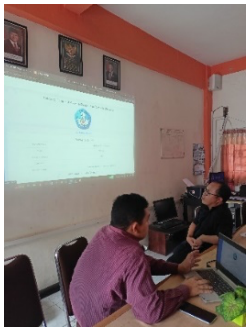

Fig. 11. Initial Testing.

IV. Result and Implementation

After designing the system, the next step is to create (source code) the program so that it produces a complete system that can be used according to the desired function. The discussion at this stage includes creating a database, creating a system display, and creating system functions.

A. Implementation

The following is the implementation of the display (software) program of the E-Report Information System at SDIT Anak Sholeh Mataram:

A.1. Login System Information E-Raport

As figure 12 the login page functions for Admin and Teachers to enter the application. To create an account must go through the admin by including the identity of the SDIT Anak Sholeh Mataram teacher. On this page, users only need to fill in the username and password that have been previously created.

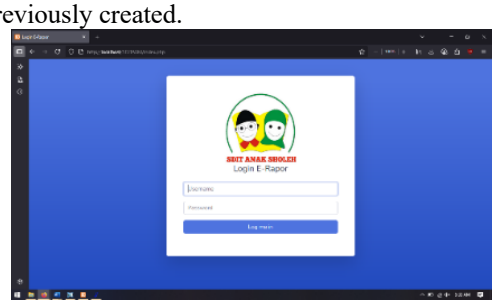

Fig. 12. Login Page.

A.2. Admin homepage

As figure 13 on the admin home page there is a difference with the teacher home page, namely in the menu access that can be accessed. Admin can access all data and all existing classes.

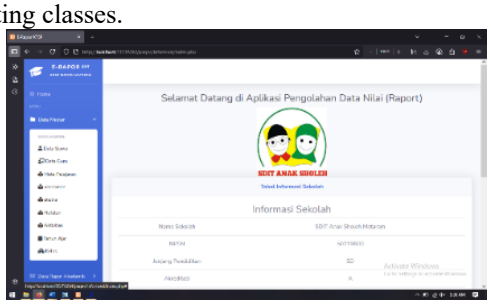

Fig. 13. Admin Homepage.

A.3. Student List Page

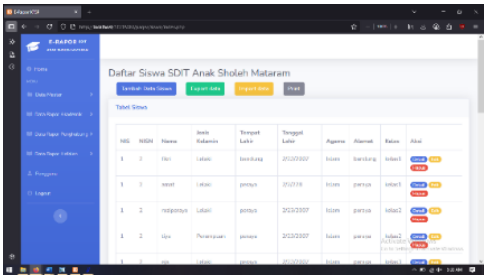

Fig. 14. Student List Page.

As figure 14 on the student list page displays all registered student data. On this page there is a function to add, change, or delete student data. And there is a function to import student data.

A.4. Add or Edit Student Page (Admin)

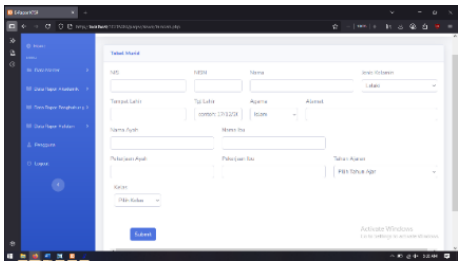

Fig. 15. Add or Edit Student Page.

As figure 15 this page functions to add or edit student data in the SDIT Anak Sholeh Mataram E-Report Information System.

A.5. Assessment List Page

As figure 16 on the assessment list page displays all registered assessment data. On this page there is a function to add, change, or delete assessment data.

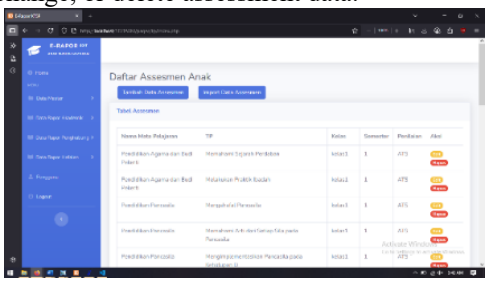

Fig. 16. Assessment List Page.

A.6. Add or Edit Assessment Page

As figure 17 this page functions to add or edit assessment data in the SDIT Anak Sholeh Mataram E-Report Information System.

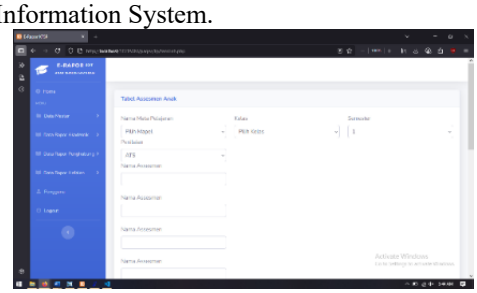

Fig. 17. Add or Edit Assessment Page.

A.7. Class List Page (Admin)

As figure 18 on the class list page displays all registered class data. On this page there is a function to add, change, or delete class data.

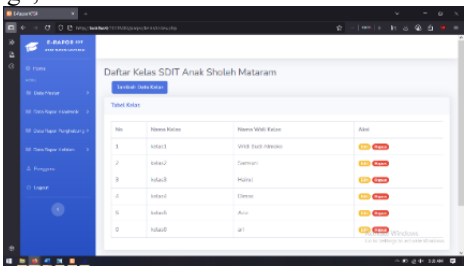

Fig. 18. Class List Page.

A.8. Add or Edit Class Page (Admin)

As figure 19 this page functions to add or edit teacher data in the SDIT Anak Sholeh Mataram E-Report Information System.

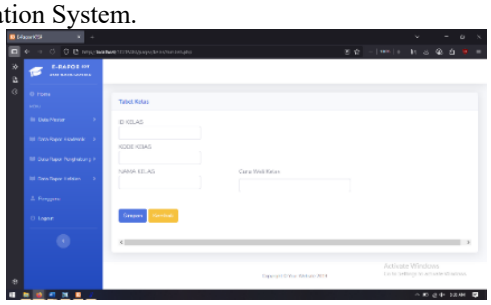

Fig. 19. Add or Edit Class Page.

A.9. Academic Score Report List Page

As figure 20 on the academic score report list page displays all registered academic score report data. On this page there is a function to add, view, or delete academic score report data.

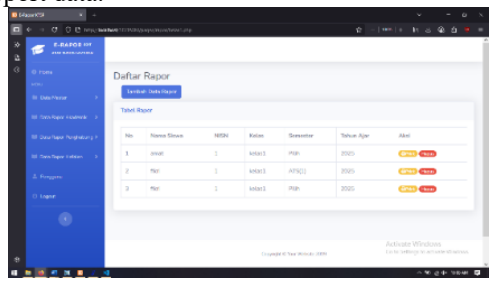

Fig. 20. Academic Score Report List Page.

A.10. Tahfiz and Tahsin Score Report List Page

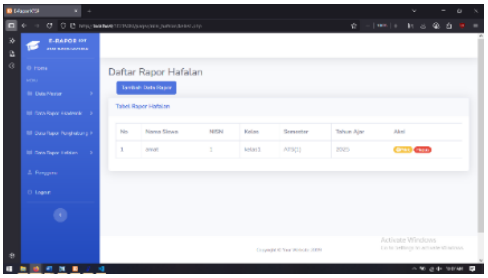

Fig. 21. Tahfiz and Tahsin Score Report List Page.

As figure 21 on the tahfiz and tahsin score report list page displays all registered tahfiz and tahsin score report data. On this page there is a function to add, view, or delete tahfiz and tahsin score report data.

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A.11. Activity Score Report List Page

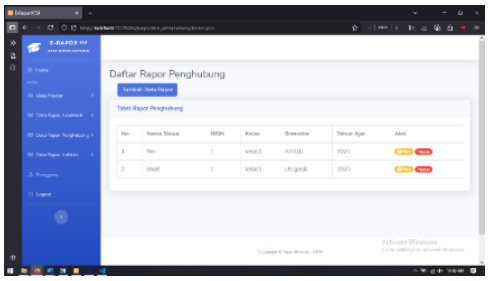

Fig. 22. Activity Score Report List Page.

As figure 22 on the activity score report list page displays all registered activity score report data. On this page there is a function to add, view, or delete activity score report data.

A.12. Student Select Page

As figure 23 this page is used to select students whose report card grades will be entered.

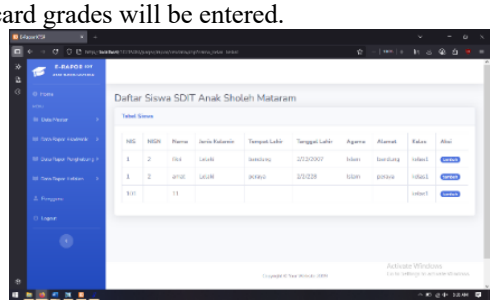

Fig. 23. Student Select Page.

A.13. Report Card Grade Filling Page

As figure 24 on this page, the admin or teacher will input the scores of students who have been previously selected.

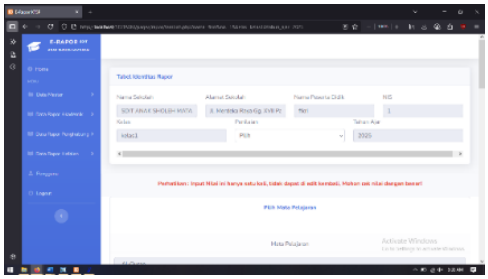

Fig. 24. Report Card Grade Filling Page.

A.14. User List Page

As figure 25 on the user list page displays all registered user data. On this page there is a function to add, view, or delete user data.

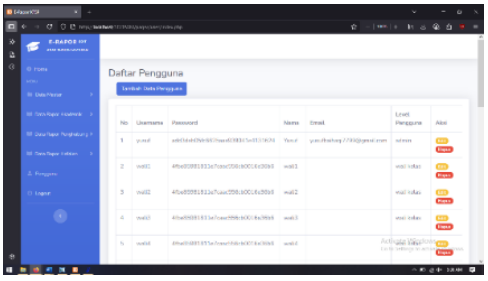

Fig. 25. User List Page.

A.15. Add or Edit User Page (Admin)

As figure 26 this page functions to add or edit teacher data in the SDIT Anak Sholeh Mataram E-Report Information System.

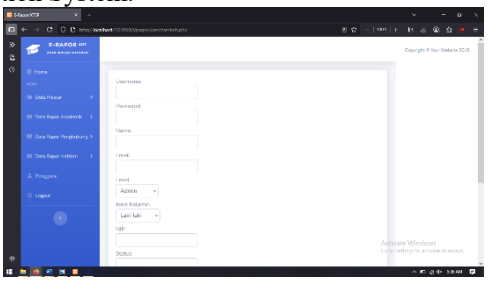

Fig. 26. User List Page.

A.16. Print Academic Grades

As figure 27 this page function to print academic grades which has previously been inputted by the admin or by the homeroom teacher in the SDIT Anak Sholeh Mataram E-Report Information System.

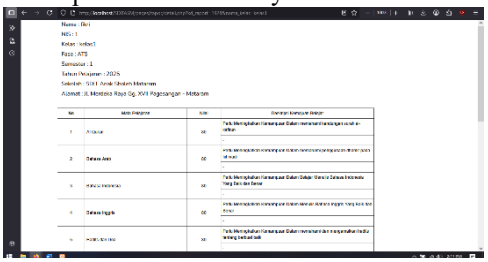

Fig. 27. Print Academic Grades

A.17. Print Tahfidz and Tahsin Grades

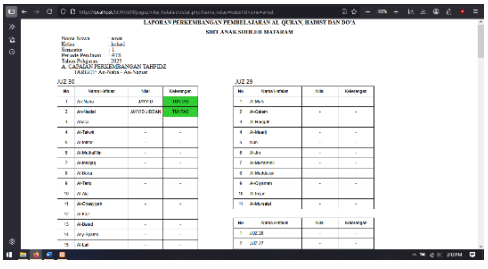

Fig. 28. Print Tahfidz and Tahsin Grade

As figure 28 this page function to print tahfidz and tahsin grades which has previously been inputted by the admin or by the homeroom teacher in the SDIT Anak Sholeh Mataram E-Report Information System.

A.18. Print Activity Grades

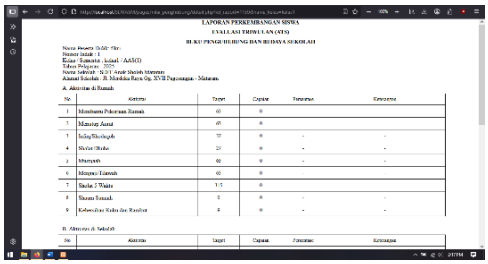

Fig. 29. Print Activity Grades

As figure 27 this page function to print activity grades which has previously been inputted by the admin or by the homeroom teacher in the SDIT Anak Sholeh Mataram E-Report Information System.

B. Testing System Information E-Report

At this stage, testing is carried out in the form of a website and is connected to a temporary database, but is still offline because it has not been hosted. Testing is carried out simultaneously with the admin and teachers from SDIT Anak Sholeh Mataram. At the testing stage, there are two types of testing carried out, namely testing and questionnaires. Both tests can assess different things such as assessing the Usability of the User Interface or interface design, and assessing the user experience on the system flow.

This test was conducted by 18 respondents consisting of admin staff and teachers.

B.1 Testing Result

As figure 27 and figure 28 showing the system feasibility test by the admin staff and teachers from SDIT Anak Sholeh Mataram.

Fig. 30. Testing Result 1.

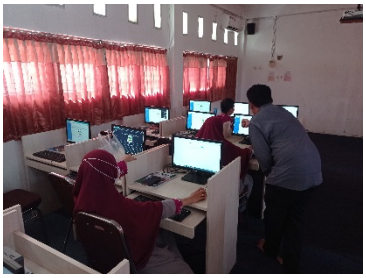

Fig. 31. Testing Result 2.

B.2 Statistical Results of Questionnaire Assessment

Testing using quantitative methods by filling out questionnaires by admin staff and teachers as respondents. There were 18 respondents who tested the e-report information system. Data grouping is based on positive and negative questions. If a respondent agrees with all positive questions and disagrees with all negative questions, the respondent is grouped as strongly agree. If a respondent answers agree to some positive and negative questions, the respondent is grouped as agree. If a respondent answers disagree to all positive questions and answers agree to all negative questions, the respondent will be grouped as disagree. As figure 29 Based on the questionnaire with 10 questions given, there were 11% of responses that strongly agreed with the results made, and there were 78% who agreed with the creation of the application and there were 11% who did disagree the creation of the application because the respondents felt that using the previous method was more comfortable.

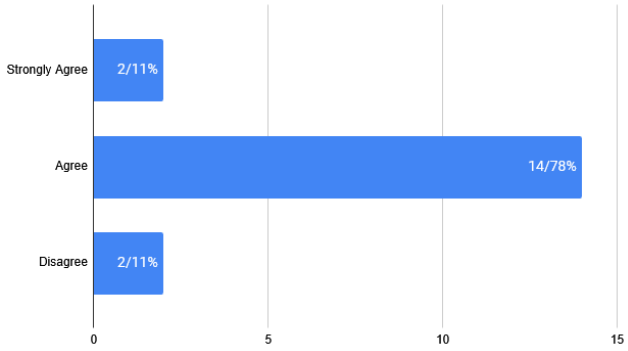

Fig. 32. Statistical Result of Questionnaire Assessment.

There were ten questions answered by respondents in the questionnaire:

- (+) I think I will use this system again.
- (-) I feel this system is complicated to use.
- (+) I feel this system is easy to use.
- (-) I need help from other people or technicians in using this system.
- (+) I feel the features on this system are running properly.
- (-) I feel there are many things that are inconsistent (not harmonious in this system).
- (-) I feel other people will understand how to use this system quickly.
- (-) I feel this system is confusing.
- (+) I feel there are no obstacles in using this system.
- (+) I need to get used to it first before using this system.

After this testing stage, the admin staff provided additional feedback on the pages that had been created in the form of additional adjustments.

V. Conclusions and Suggestions

A. Conclusion

The conclusion of this study shows that the application of the RAD method in the development of "Web-Based E-Report Information System at SDIT Anak Sholeh Mataram" provides significant benefits in accelerating the system development process and improving the quality of the resulting system. Directly, the application of RAD has succeeded in increasing the efficiency of development time and the effectiveness of the system in meeting the operational needs of teachers. In addition, this system is also able to reduce dependence on manual processes, increase data accessibility, and facilitate school data management so as to support more optimal assessments for teacher staff, this is evidenced by the results of the questionnaire that answered agree with the number of 78%.

B. Suggestions

Optimization of the security system. Since this system is web-based and manages important data such as student and teacher data, it is very important to implement a strong security system. Data protection, especially user personal data, needs to be improved through encryption, layered authentication, and regular security system updates.

- Improvement of the user interface (UI/UX). In order for this system to be easily accessible and used by all groups, it is important to improve the interface and user experience aspects. A user-friendly system will be easier for teaching staff to use and increase the convenience of using the service.
- Periodic evaluation and further development. Given that technology continues to develop, periodic system evaluation and improvements as needed will be very important. Additional features such as an import system for all data or a data search feature can be added to improve user convenience.
- Web-based report card filling training. To ensure that the system can be used optimally, the admin staff and teachers need to be given technical training on the use and maintenance of the system. Thus, the full potential of this e-report information system can be achieved.

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