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Web-Based E-Rapor Application Development Using Laravel 11 at SDN Burangkeng 05

Arif Syarifudin[1], Helmi Prayogo Pangestu[2], Maulana Yusuf[3], Evitra Fitri[4]
[1,2,3,4] Faculty of Information Technology, Nusa Mandiri University, Jakarta, Indonesia

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ABSTRACT

The advancement of computer technology has significantly impacted the education sector, transitioning conventional learning methods into more digital-based approaches. However, many schools still manage academic assessments manually, which often results in inefficiencies, data inaccuracies, and limited access to academic information. The implementation of a digital academic system like e-Rapor offers a solution by enabling efficient and accurate data management, while also allowing parents to monitor student progress in real-time. This study focuses on SD Negeri Burangkeng 05 in Bekasi Regency, West Java, which still relies on manual processes using Microsoft Excel for academic reporting. The lack of a digital system has led to delays, limited data transparency, and difficulty in fulfilling administrative and accreditation needs. To address this issue, this research aims to develop an e-Rapor system suited to the school's needs. The system is expected to improve academic data management, support administrative efficiency, and enhance the overall quality of educational services.

Corresponding Author:

Arif Syarifudin
Faculty of Information Technology
Nusa Mandiri University
Jakarta, Indonesia
Email: Arif.syarifudin1105@gmail.com

1. Introduction

Advances in computer technology have had a significant impact on education, transforming conventional learning methods. The use of computers in the educational process has transformed perspectives on learning, creating challenges and opening up new opportunities for student knowledge development [1]. Essentially, technology is a process aimed at adding value to products, thereby enhancing their utility [2]. In the world of education, technology has had a significant impact, transforming systems, the roles of educators, educational staff, and students' daily lives. Therefore, if someone fails to keep up with technological developments, they will have difficulty accessing information and risk being left behind in pursuing various development opportunities [3]. Therefore, creating a digital-based educational environment is crucial to meet the ever-increasing public demand for quality educational services [4].

The academic assessment process in many schools is still conducted manually, requiring teachers to enter and calculate student grades in writing before finally summarizing them on printed report cards. This method is often time-consuming, prone to recording errors, and inefficient in storing and distributing information [5]. In addition, parents of students often experience difficulties in obtaining information about

their children's academic progress in real time, because they still rely on the distribution of report cards at the end of the semester.

Along with the development of information technology, the implementation of e-Report Cards (e-Report Cards) has become a relevant solution for increasing efficiency and accuracy in student grade management. E-Report Cards enable teachers to manage and communicate student learning outcomes digitally, thereby reducing the possibility of administrative errors and expediting the academic evaluation process. Furthermore, this system also facilitates access for parents to monitor their children's academic progress through an integrated portal or application [6].

Research [7] has shown that e-Report Cards play a crucial role in increasing the efficiency and effectiveness of learning in schools. This system facilitates teachers' assessments, provides feedback, and provides comprehensive information on student learning progress. Despite its numerous benefits, the implementation of e-Report Cards still requires review, particularly regarding its alignment with the Independent Curriculum, the challenges faced, and improvements to optimize its use.

Research [8] found that e-Report Cards offer a digital innovation solution aimed at accelerating and simplifying the process of managing academic data in schools, replacing manual systems that still rely on paper-based recording. With features such as data collection, assessment, and scheduling, e-Report Cards help schools provide more effective and efficient academic services. Furthermore, implementing this system also supports the school's image as an institution that is adaptive to technology and focused on improving the quality of education.

However, in reality, many schools in Indonesia, particularly elementary schools in Bekasi Regency, West Java, still do not have an e-Report system. This lack of a system prevents these schools from experiencing the significant benefits of digitalization in academics. This is due to the limited knowledge and skills of educators and educational staff in developing and implementing digital systems [9]. One such system is Burangkeng 05 Public Elementary School.

Burangkeng 05 Public Elementary School is an elementary school in Bekasi Regency, located in the Bekasi Timur Regency housing complex. Established in 2022, the school now has 232 students and 7 teachers. Its development has gradually improved over the years, including easy access to the school, adequate infrastructure, and the implementation of the national curriculum. However, Burangkeng 05 Public Elementary School still lacks an e-Report system for managing academic data. Student grade management has been carried out manually, using Microsoft Excel.

The lack of an e-Report system at Burangkeng 05 Public Elementary School has limited the recording and reporting of academic data. The process of recapitulating grades, compiling academic records, and reporting student learning outcomes is still carried out conventionally, often leading to delays in data processing and difficulties in comprehensive academic evaluation. Furthermore, the lack of a digital system also hinders the school from providing accurate and well-documented academic data for accreditation and educational development purposes.

The implementation of an e-Report system is a solution that can improve the efficiency and accuracy of information delivery and academic data management at Burangkeng 05 Public Elementary School. Through this system, the school can simplify archiving, expedite administrative processes, and provide more transparent and accessible access to information. An integrated information system will also help the school minimize errors that often occur in manual processes. Based on the background of the problem, the research aims to build an e-Report system at SD Negeri Burangkeng 05. It is hoped that with the e-Report system, schools can improve the quality of educational services and facilitate the delivery of academic information, so that SD Negeri Burangkeng 05 can be better prepared to face challenges in the digital era.

2. Research Method

This research aims to design and develop an integrated e-Report information system to improve the efficiency and effectiveness of academic data management at SD Negeri Burangkeng 05. The research was conducted systematically through several stages that include problem identification, analysis of the current system, and system design. Each stage is designed to explore real needs in the field and formulate targeted information technology solutions for SD Negeri Burangkeng 05, so that it can support data-based decision making and improve the quality of educational services. These stages are explained in the form of a simple flowchart as follows:

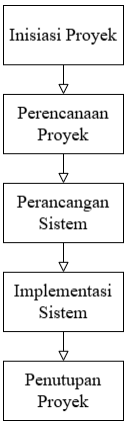

Figure 1. Flowchart of Research Stages

During the project initiation phase, a problem identification and analysis of the existing system at SD Negeri Burangkeng 05 was conducted to obtain a comprehensive overview of the current state of academic data management at the school. Currently, the administration and grade recording processes are still carried out manually, with teachers or school staff recording grades, attendance, and student progress using paper or gradebooks, then summarizing the data separately in Microsoft Excel. This manual system causes various problems, such as long processing times, a high risk of data input errors, and difficulty in monitoring student progress comprehensively and in real time. Furthermore, the academic evaluation process becomes inefficient due to scattered and unintegrated data.

The school also faces challenges in preparing timely and accurate reports and risks losing critical data due to the lack of a digital backup system. This situation places an additional workload on teachers, complicates documentation processes, and hinders the effectiveness of data-driven decision-making. Based on these findings, it can be concluded that SD Negeri Burangkeng 05 urgently needs an information technology-based solution in the form of an integrated e-Report system to improve efficiency, accuracy, and ease of digital academic data management. The details of the process are as follows:

Manual administrative processes without an e-Report system require schools to manually record grades, attendance, and student progress reports. This is time-consuming, prone to human error, and makes it difficult to monitor data directly, thus reducing efficiency in school administration.

Without an e-Report system, schools struggle to monitor student progress comprehensively and in a timely manner. Because data is not integrated, evaluating student academic progress becomes more difficult and time-consuming, ultimately hindering rapid response to students requiring special attention.

Schools that do not use e-Report will face difficulties in preparing timely and accurate academic reports. Without an integrated system, processing and analyzing academic data, such as grades, attendance, and student progress, becomes more complex, time-consuming, and potentially results in inaccurate reports.

The project planning phase is the main foundation for the successful development of the e-Report information system at SD Negeri Burangkeng 05. In this phase, the scope, product description, critical success factors, expected benefits, technology used, and project description are determined in a measurable manner, while also compiling an activity schedule, resource allocation, and required budget. Planning also includes stakeholder identification and establishing communication and reporting mechanisms to ensure effective coordination. In addition, a risk analysis is conducted to map potential technical and non-technical obstacles, complete with mitigation strategies. With thorough and directed planning, all subsequent stages from analysis, design, to implementation can be carried out systematically, on time, and with the expected quality, thus supporting the achievement of the goal of increasing the efficiency of academic data management at the school.

3. Result and Discussion

The scope of the e-Report Card (e-Report) project at SD Negeri Burangkeng 05 includes the development and implementation of a digital system for managing grades, attendance, and student academic data that is easily accessible and user-friendly for administrators, teachers, and school staff. This project includes the automatic generation and printing of report cards, allowing teachers to more efficiently process data and prepare report cards without manual errors. In addition, this project includes providing training for teachers and staff to use this system, as well as implementing measures to ensure the security and integrity of student data. This system is expected to reduce reliance on time-consuming manual methods and improve the

overall efficiency of school administration. System maintenance and technical support will also be provided to ensure smooth operations.

Use Case Diagram Admin

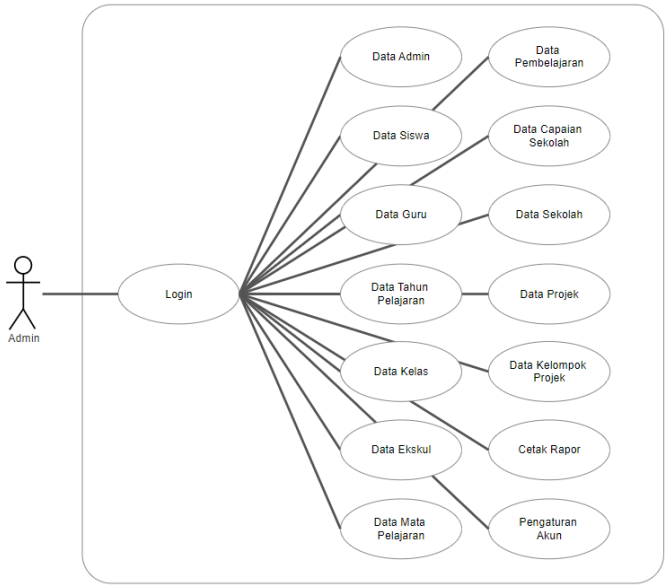

Figure 2. Admin Use Case Diagram

The use case diagram above illustrates the interaction between the Admin actor and the various features available in the e-Rapor system. The Admin is the primary user with full access to all data and functions within the system. Access begins with a login process, which serves as the entry point into the system. After successfully logging in, the Admin can manage various important data, such as admin data, teacher data, student data, and school data. In addition, the Admin is also responsible for managing academic aspects, which include subject data, learning data, academic year data, class data, and extracurricular data. Not only limited to academics, this system also includes features for managing project data, project group data, and school achievement data. All of this data plays a crucial role in the preparation of academic reports, which can then be printed using the report card printing feature. Additionally, the Admin also has access to account settings to ensure proper user management. With this flow, the e-Rapor system allows the Admin to manage school data comprehensively and integratedly within a single, efficient digital platform.

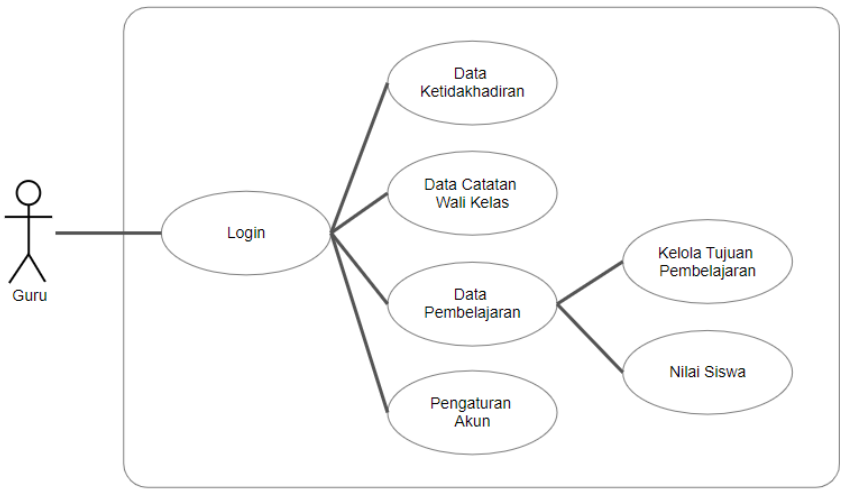

Figure 3. Teacher Use Case Diagram

The use case diagram above illustrates the role and activities of the teacher actor in the e-Rapor system. Interaction begins through the login process, which serves as the primary access to all features available to teachers. After successfully logging in, teachers can manage several important data directly related to teaching and learning activities. Key features accessible to teachers include student absence data, which is used to record and monitor students' daily attendance. Teachers can also fill out homeroom teacher notes, which contain important information about students' non-academic development, such as attitudes, behavior, and other matters that need to be recorded in the homeroom teacher's role. Furthermore, teachers have access to learning data, which includes two important functions: managing learning objectives and entering student grades. This feature allows teachers to develop learning achievement indicators and systematically assess students' academic progress. Finally, an account management feature is also available, allowing teachers to update personal account information and make basic settings as needed. Overall, this diagram demonstrates that the e-Rapor system is designed to assist teachers in managing the learning process and academic administration digitally, efficiently, and in an integrated manner.

Entity Relationship Diagram (ERD)

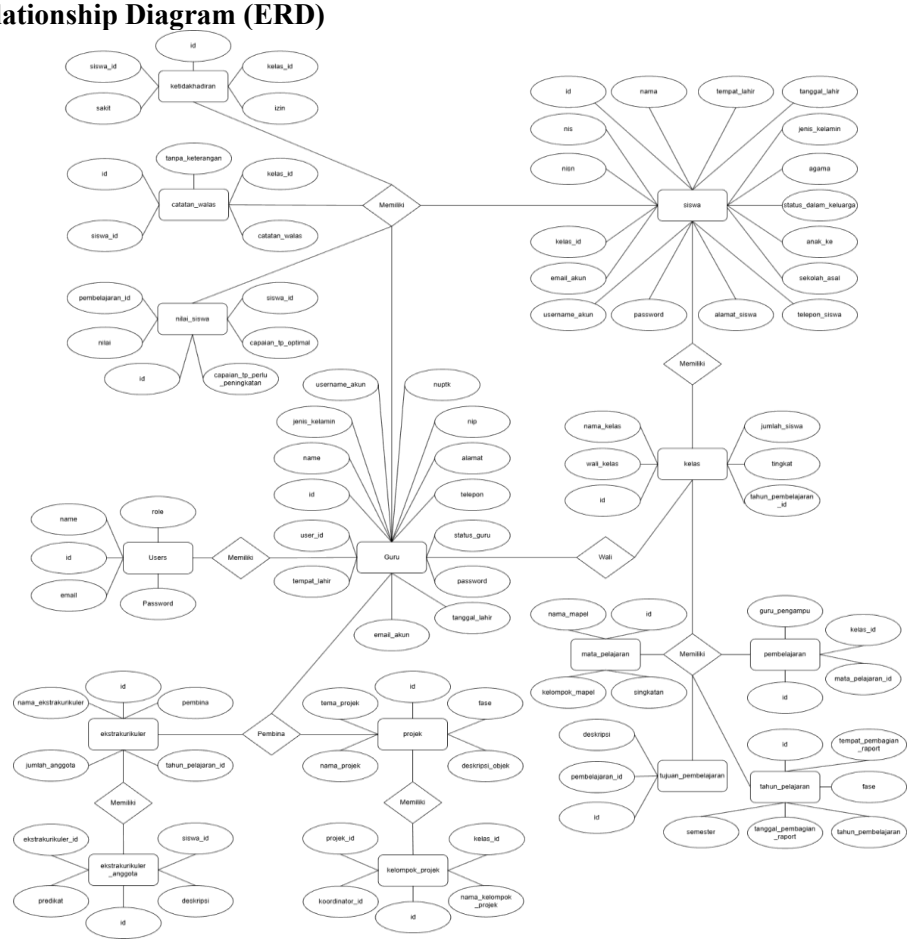

Figure 4. Entity Relationship Diagram e-Report

The e-Rapor system design presents two core interfaces: a minimalist login page with the school logo and an email/password form for authentication, and a main dashboard page divided into a school logo area (header), a navigation menu panel on the left side for quick access to various e-Rapor menus, and a large content area on the right side for displaying dynamic information, creating a structured and easy-to-navigate user experience.

User Interface Design

The user interface (UI) design for e-Rapor includes:

Home Page View

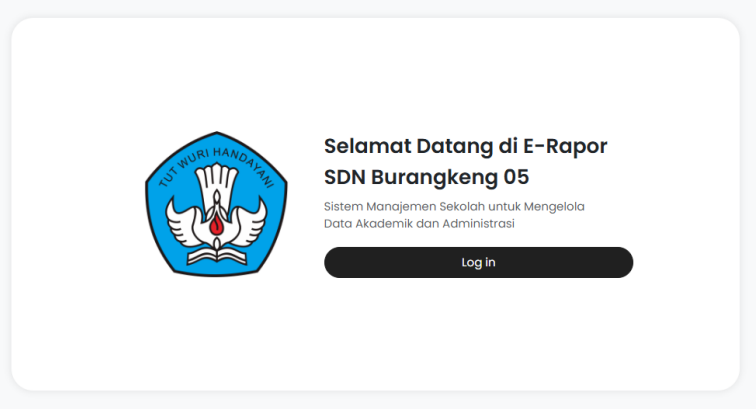

Figure 5. Main Page View

Login Page View

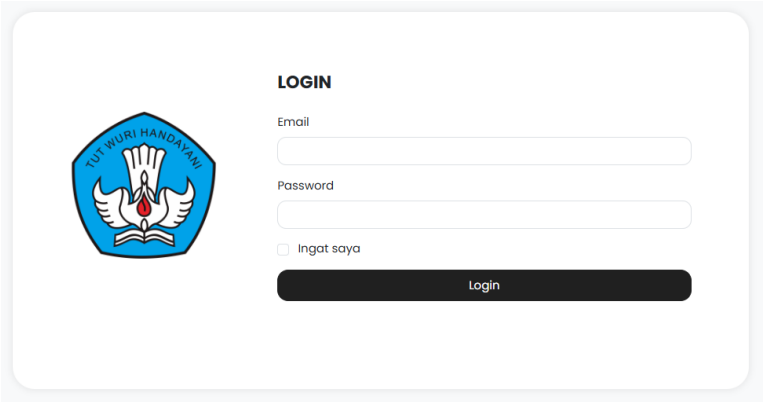

Figure 6. Login Page Display

The e-Rapor interface design features two main pages: a welcoming homepage featuring the school logo, the text "Welcome to E-Rapor SDN Burangkeng 05," and a "Log in" button. A consistent login page features the school logo on the left side, "Email" and "Password" input forms, a "Remember me" option, and a "Login" button on the right side. All are intuitively designed to maintain a minimalist aesthetic.

Dashboard View

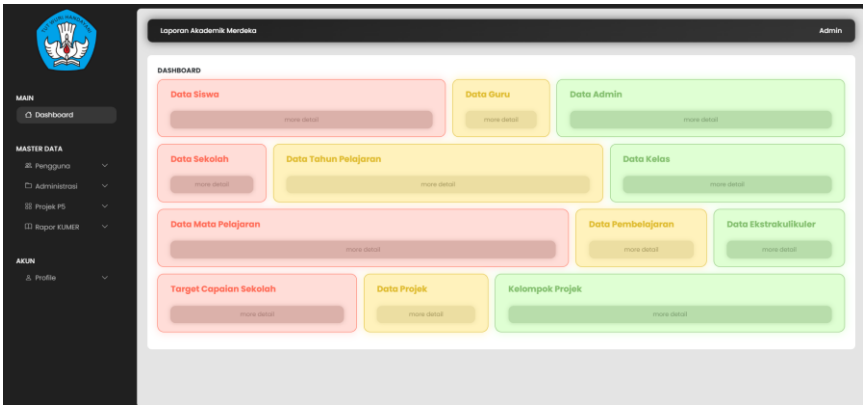

Figure 7. Admin Dashboard View

The Admin Dashboard has an intuitive interface, designed with a dark navigation sidebar on the left side that displays the school logo and structured menus such as Dashboard, Master Data and Account for easy navigation. The main content on the right side is presented in the form of a colorful information set (red, yellow, green) to display important data such as "Student Data", "Teacher Data", and "School Data", each equipped with a "more details" button for access to further information, providing a clear and organized overview.

Teacher Dashboard

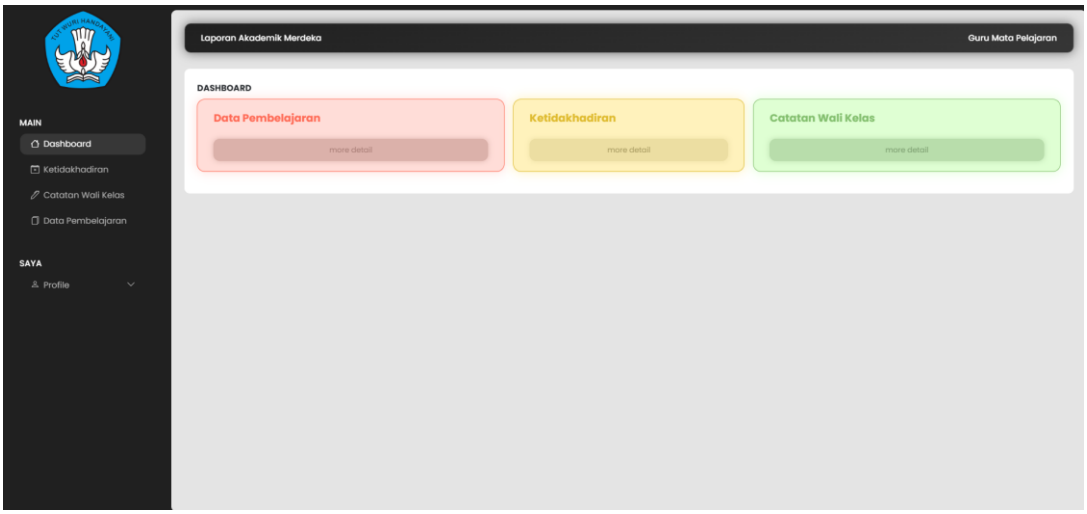

Figure 8. Teacher Dashboard View

The teacher role's user interface dashboard features a streamlined two-column layout. On the left, a dark navigation sidebar contains the school logo and structured menus relevant to teachers, such as Absences, Homeroom Notes, and Learning Data. Meanwhile, the main content area on the right features shortcuts to "Learning Data," "Absences," and "Homeroom Notes," each with a "more details" button, allowing teachers to quickly and easily access important information.

Profile Page View

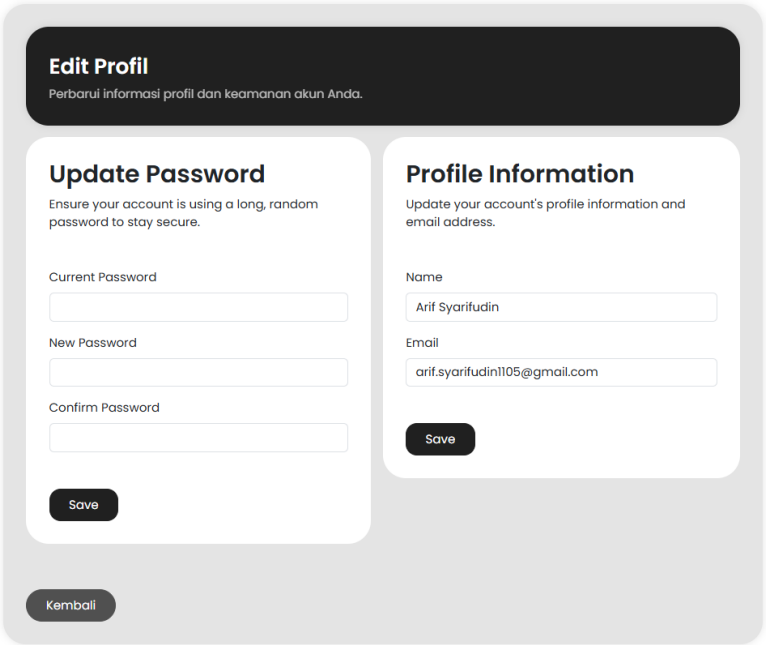

Figure 9. Profile/Settings Page View

The "Settings" interface within the e-Report system is well-structured. Each element is positioned to maximize usability and provide a seamless navigation experience. The settings page fundamentally serves as the primary control center for every user, both administrators and teachers. It provides complete control over account security and allows users to easily update access credentials.

Student Data Access Admin Menu Display

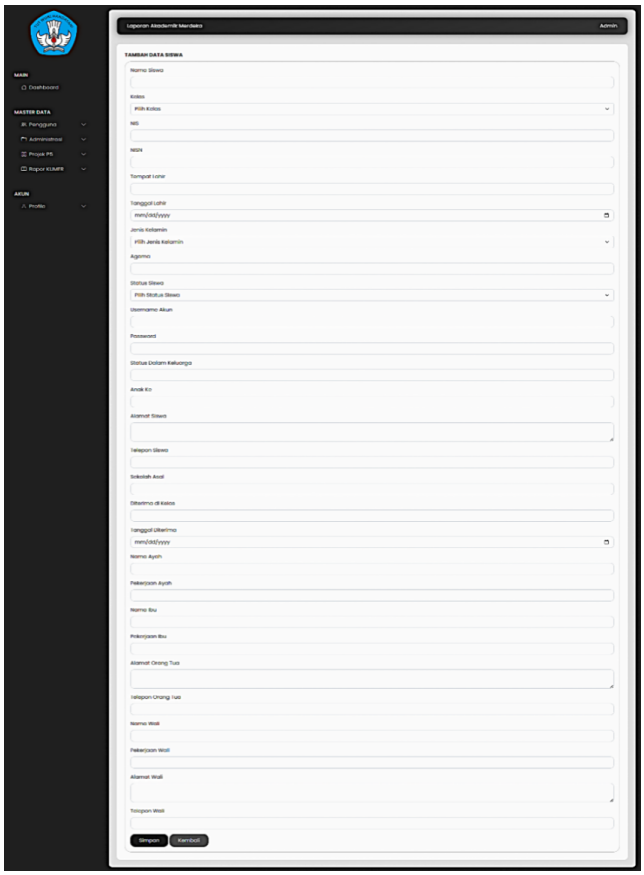

Figure 10. Student Data Menu Display

This page displays the user interface (Admin) for integrated "STUDENT DATA" management. The main content is presented in a table format that displays a list of students with columns such as Number, Name, Class, NIS/NISN, L/P (Gender), and Student Status. There are features to add students, search for students by name/NIS/NISN, as well as action buttons on each row to run CRUD functions directly.

Teacher Data

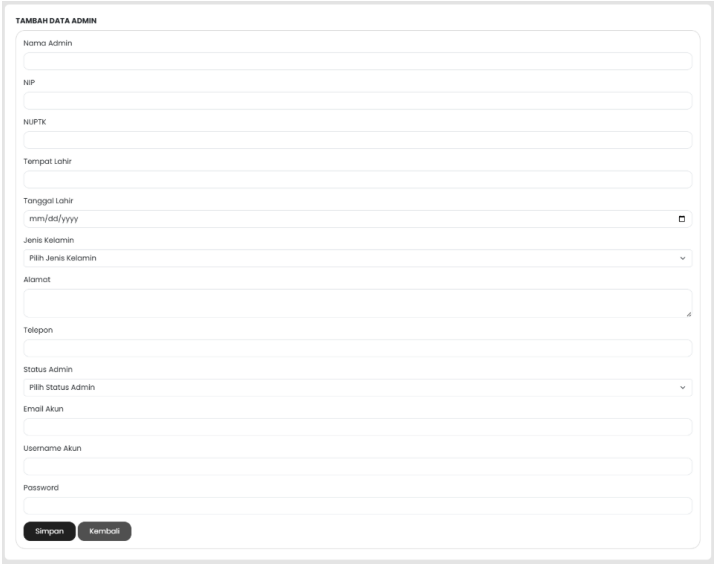

Figure 11. Teacher Data Menu Display

This page displays a user interface (Admin) focused on managing "TEACHER DATA" in the e-Rapor system. The columns displayed include Teacher Number, Name, Student ID Number/NUPTK Number, Place/Date of Birth, Gender, and Status. For ease of management, there is an add-teacher feature, controls to adjust the amount of data displayed, and a teacher search function based on name/NIP/NUPTK. Action buttons are also provided in each row for direct CRUD functions.

This user interface displays the "ADMIN DATA" page in the e-Rapor system, designed with an efficient table-based layout. The main table displays a list of administrators with important columns such as Number, Name, Student ID Number/NUPTK Number, Place/Date of Birth, Gender, and Status. For ease of management, this page provides an add-admin feature, controls to adjust the amount of data displayed, and a search function based on name/NIP/NUPTK. Each row of administrator data is equipped with action buttons to provide direct CRUD capabilities from the table view.

Administration > School Data

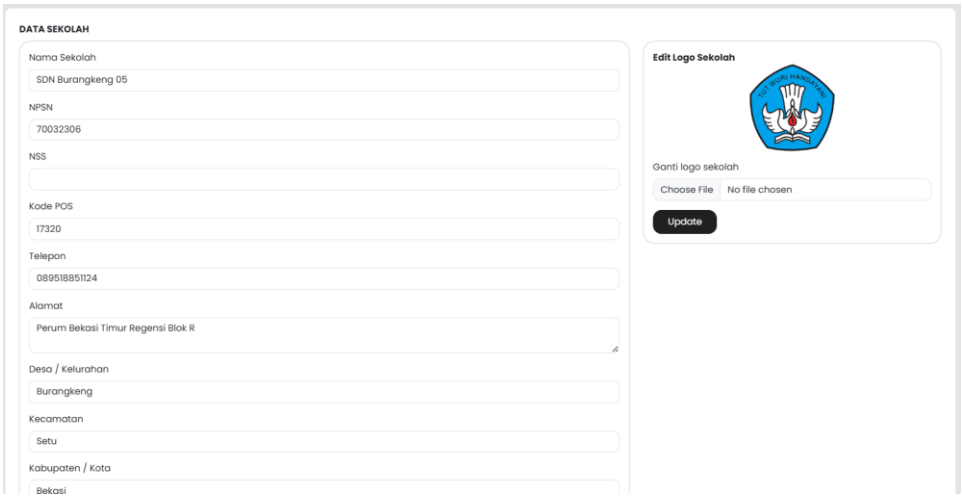

Figure 12. School Data Menu Display

The user interface above displays a structured "SCHOOL DATA" page, divided into two main columns. The left column provides a comprehensive form for managing detailed school information such as Name, NPSN, NSS, ZIP Code, Telephone, and complete address (including Village/Sub-district, District, Regency/City, and Province). Meanwhile, the right column is dedicated to "Edit School Logo," allowing users to view the current logo and upload a new one via the "Choose File" option followed by the "Update" button, presenting school data editing functionality in a clear and organized layout.

Administration

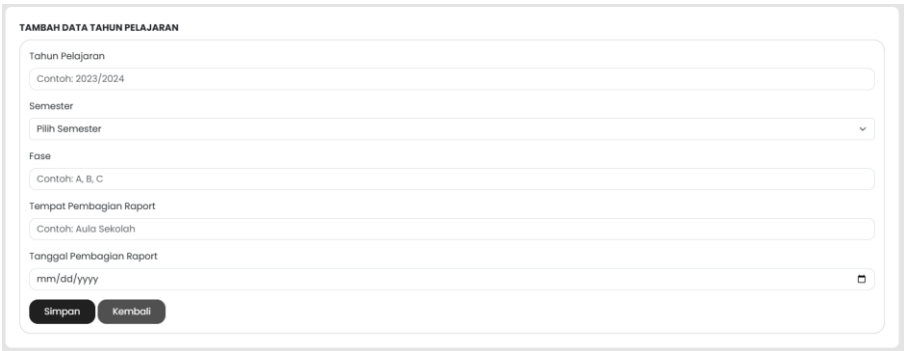

Figure 13. Academic Year Menu Display

This user interface displays a structured "SCHOOL YEAR DATA" page, which serves as the central management point for school year data within the e-Report system. This page presents

information in a tabular format, including columns such as Number, School Year, Semester, Phase, Report Card Distribution Location, and Report Card Distribution Date. To facilitate data management, there is a feature to add school years, an option to adjust the amount of data displayed, and a search feature specific to a school year. Each row of data is equipped with action buttons that enable CRUD operations directly from the table.
Administration > Class Data

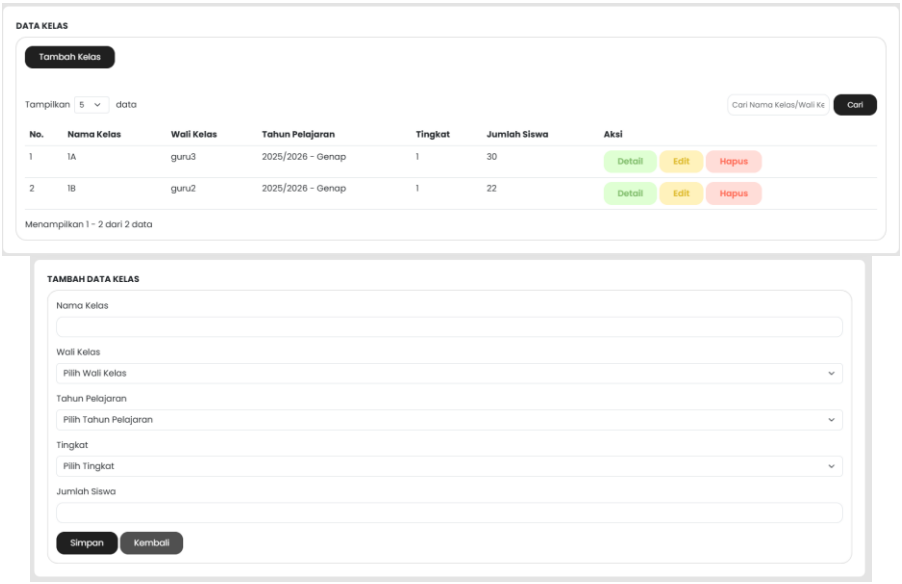

Figure 13. Class Data Menu Display

This user interface displays a structured and user-friendly "CLASS DATA" page. This page features an add class feature for adding new entries. Class data is presented in an informative table format, containing columns such as Number, Class Name, Homeroom Teacher, School Year, Grade, and Number of Students. For efficient management, controls are available to adjust the amount of data displayed per page, as well as a search function by class name or homeroom teacher. Each row of class data is accompanied by a series of colored action buttons, allowing users to perform CRUD operations directly.
Administration > Subject Data

Figure 14. Subject Data Menu Display

This user interface displays an organized "SUBJECT DATA" page, designed to simplify the management of the course list. A new "Add Subject" feature is available for adding new entries. Subject data is presented in an informative table format, featuring columns for Number, Subject Name, Abbreviation, and Subject Group. Data management features include controls for adjusting the number of rows displayed, as well as a search function based on the subject name, abbreviation, or code. Each row in the table has a colored action button that allows users to perform CRUD operations directly.
Administration > Learning Data

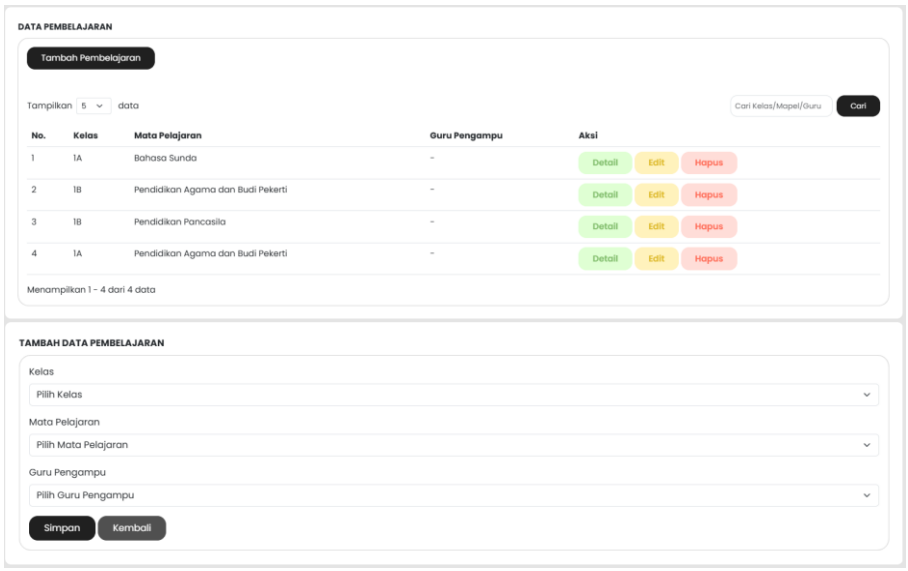

Figure 15. Learning Data Menu Display

The user interface above displays the "LEARNING DATA" page, designed for managing schedules or learning information. This page is equipped with an add learning feature for inputting new data. Learning information is presented in a neat table format, including columns for Number, Class, Subject, and Instructor. For easy navigation and searching, there are controls to adjust the amount of data displayed per page, as well as a search feature by class, subject, or instructor. Each row of data in the table is equipped with a colored action button that allows for direct CRUD operations.

Extracurricular Data

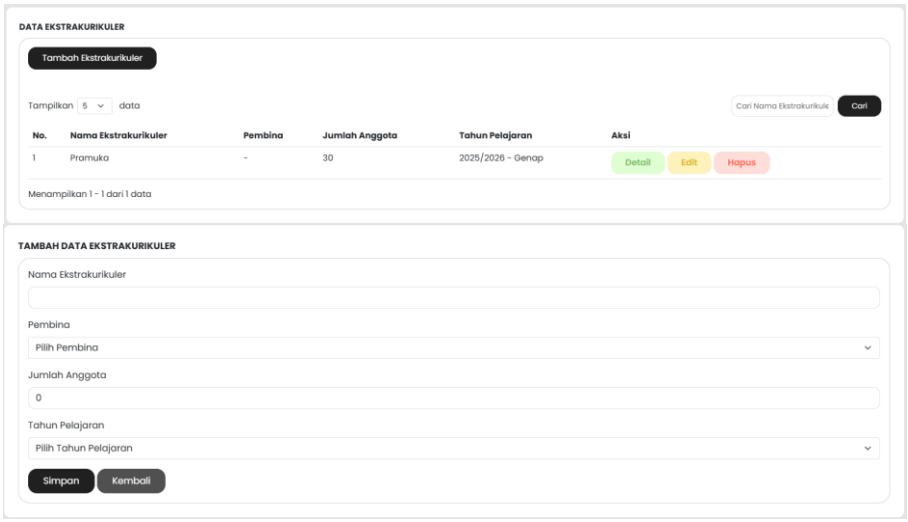

Figure 16. Extracurricular Data Menu Display

This user interface displays an organized "EXTRACURRICULAR DATA" page for managing extracurricular activity information. This page features an add extracurricular feature for new data entry. Extracurricular data is presented in an informative table format, with columns for Number, Extracurricular Name, Supervisor, Number of Members, and Academic Year. Data management functions include controls for adjusting the number of data displays per page, as well as a search feature by extracurricular name. Each row of data is equipped with colored action buttons for direct CRUD operations.

Homeroom Teacher's Notes

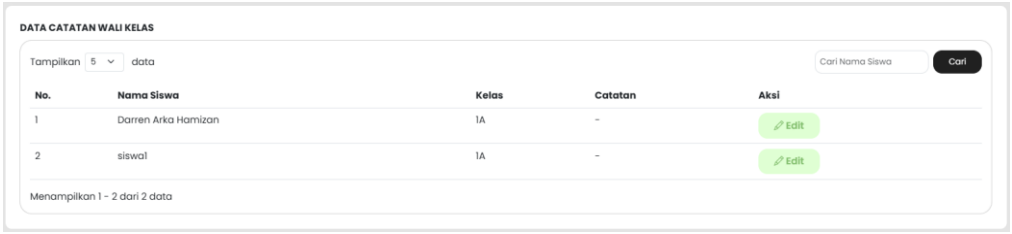

Figure 17. Homeroom Teacher Notes Menu Display

This user interface features a structured "Homeroom Teacher Notes" page, designed to easily manage individual student notes. The page displays data in a neat table format, including Student Number, Student Name, Class, and Notes columns. For efficiency, controls are available to adjust the amount of data displayed per page, as well as a search feature by student name. Each row of data is accompanied by a green "Edit" button in the "Actions" column, allowing homeroom teachers to modify the note directly.

Learning Data

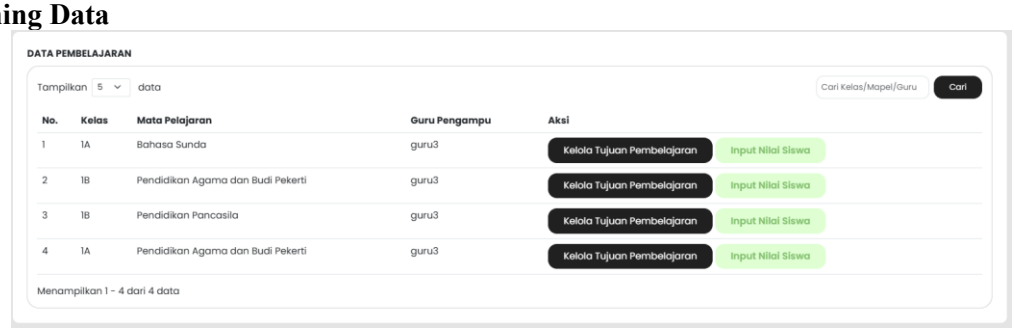

Figure 18. Learning Data Menu Display

This user interface displays the "LEARNING DATA" page, designed to manage various learning entries. This page displays data in a table format, including columns for Number, Class, Subject, and Teacher. For ease of management, there are controls for adjusting the number of records displayed per page, as well as a search feature by class, subject, or teacher. Each row of data is equipped with two different action buttons, namely "Manage Learning Objectives" (black) and "Input Student Grades" (green), allowing users to navigate to specific functions related to each learning entry.

Learning objectives

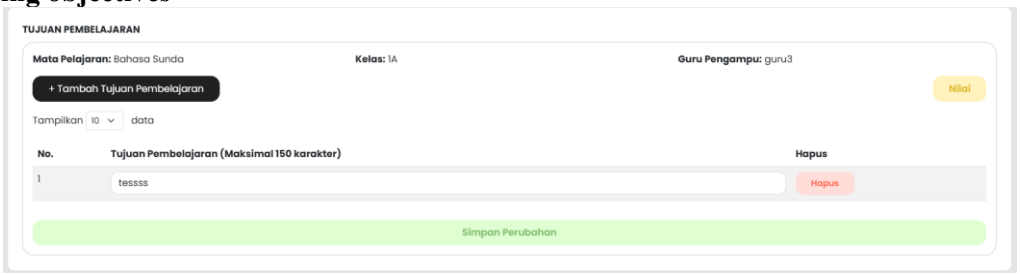

Figure 19. Student Grade Input Menu Display

This user interface displays a specific "LEARNING OBJECTIVES" page, displaying the Subject, Class, and Instructor context at the top. This page is used to manage learning objectives, which are presented in a table format with columns for Number, Learning Objective (with a 150 character limit), and a "Delete" button for each entry. Users can add new objectives via the "Add Learning Objective" button and save all changes with the green "Save Changes" button at the bottom. There is also a "Grade" button in the top right corner, indicating the transition to the grade input page.

Student Grade Input

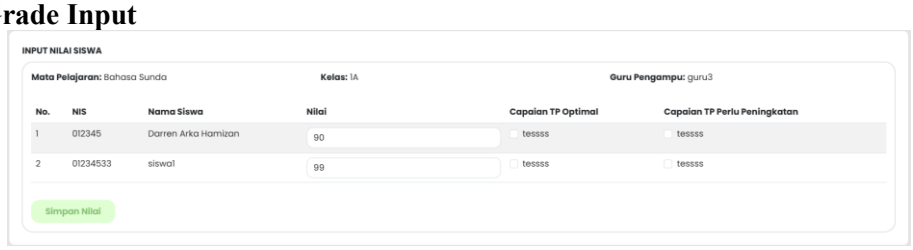

Figure 20. Student Grade Input Menu Display

This user interface displays the "STUDENT GRADE INPUT" page, designed to make it easier for teachers to enter student grades and achievements. At the top, there is clear contextual information regarding the Subject, Class, and Instructor. The main table displays a list of students with columns for Student Number, Student ID Number, and Student Name, complemented by input columns for Grade, Optimal TP Achievement, and TP Achievement Needs Improvement for each student. The entire input process is completed with the green "Save Grade" button at the bottom, ensuring efficient data storage.

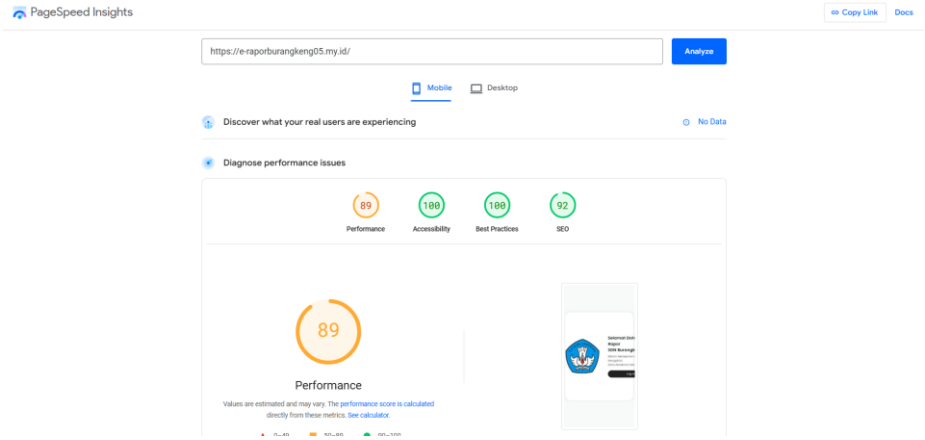

Figure 21. Performance Testing

4. Conclusion

Overall, this project has successfully achieved its objectives and is expected to make a significant contribution to the advancement of education. The academic information system project implemented at SD Negeri Burangkeng 05 has provided various tangible benefits. Firstly, the system facilitates easier access to academic information for the school, thus enhancing communication and coordination among all relevant parties. Second, it enables more structured and systematic management of academic data, reducing reliance on time-consuming and error-prone manual processes. Although the project faced several challenges, such as limited technological knowledge among teachers and staff, these obstacles were effectively overcome through strong teamwork and the appropriate use of technology. The project was executed according to plan, supported by effective monitoring and control measures that ensured timely completion, adherence to the budget, and compliance with quality standards. The positive impact of this system's implementation is evident in the improved quality of educational services at the school, particularly in the more efficient and effective processing of academic data. Moving forward, the academic information system will continue to be updated and developed in a sustainable manner to keep pace with technological advances and the ever-evolving needs of the education sector.

Acknowledgement

With utmost respect and appreciation, we would like to express our sincere gratitude to all parties who contributed to the success of this project. Special thanks go to the principal, teachers, staff, and the entire team for their support, cooperation, and dedication throughout the design and implementation process of the academic information system. We also extend our thanks to those who provided valuable input, suggestions, and technical assistance that greatly contributed to the improvement of this project. We hope that the results of this collaboration will bring lasting benefits to the quality of education at SD Negeri Burangkeng 05.

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