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IMPLEMENTATION OF THE RAD METHOD ON THE STUDENT REPORT CARD MANAGEMENT WEBSITE AT SMP ALAM AL-KARIM

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Abstract

Alam Al-Karim Junior High School (SMP) is a private educational institution located in Pinang Jaya Village, Kemiling District, Bandar Lampung City, Lampung Province. The academic information system implemented at this school is considered suboptimal, as it still relies on manual processes. This situation has led to several issues, particularly in recording teacher and student data, monitoring student attendance, and managing subject assessments. Therefore, the aim of this study is to develop a website-based academic information system utilizing the Rapid Application Development (RAD) method. The goal is to produce an application capable of providing the expected student report card information. The system testing was conducted through a survey using a Google Form questionnaire, which involved 11 respondents. The survey results indicated an average success rate of 14.7% based on response frequency. The implementation of a website-based report card management system has accelerated the presentation of academic information at SMP Alam Al-Karim, as evidenced by a 7.35% agreement frequency among respondents. Furthermore, data management processes have become more efficient, contributing to improved time efficiency and report generation effectiveness.

Keywords: School; SMP Alam Al-Karim; Assessment; Report Cards; Website-Based Report Card Development

Abstrak

Sekolah Menengah Pertama (SMP) Alam Al-Karim merupakan sekolah swasta tingkat menengah pertama yang berlokasi di Desa Pinang Jaya, Kecamatan Kemiling, Kota Bandar Lampung, Provinsi Lampung. Dalam pelaksanaannya, sistem informasi akademik yang digunakan di sekolah ini dinilai belum optimal, karena masih dilakukan secara manual. Permasalahan ini menimbulkan berbagai kendala, terutama dalam proses pencatatan data guru, data siswa, kehadiran siswa, serta penilaian mata pelajaran. Oleh karena itu, tujuan dari penelitian ini adalah merancang dan membangun sistem informasi akademik berbasis website dengan menggunakan metode Rapid Application Development (RAD). Dengan penerapan metode ini, diharapkan dapat dihasilkan aplikasi yang mampu menyajikan informasi nilai rapor siswa secara efektif. Pengujian sistem dilakukan melalui survei dengan menggunakan kuesioner berbasis Google Form, yang melibatkan 11 responden. Hasil survei menunjukkan rata-rata tingkat keberhasilan sebesar 14,7% berdasarkan frekuensi jawaban. Implementasi sistem pengembangan nilai rapor berbasis website ini membuat penyajian informasi akademik di SMP Alam Al-Karim menjadi lebih cepat, dengan tingkat kesesuaian responden sebesar 7,35% berdasarkan frekuensi jawaban. Selain itu, pengelolaan data menjadi lebih mudah, serta meningkatkan efisiensi waktu dan efektivitas dalam pembuatan laporan akademik.

Kata kunci: Sekolah, SMP Alam Al-Karim, Penilaian, Rapor, Website Pengelolaan Nilai

INTRODUCTION

Science and information technology have developed very rapidly, producing various new innovations that are always moving towards a better direction (Aryasatya & Wibawa, 2022) . Science is a systematic effort to obtain knowledge that can be tested and relied upon, by following regular stages based on certain principles and procedures. Meanwhile, technology is defined as the application of scientific discoveries to solve various practical problems (Winarni, 2020) . Schools as educational institutions have a high dependence on data and information, especially in managing school administrative data such as processing student grades (Hidayanti et al., 2021). A report card is an official document that contains information about students' learning skills and

achievements at school, which functions as a teacher's report to parents or guardians (Febriyanto & Naufal, 2019) . Report card management is usually sourced from student activity reports, in the form of academic grades and information related to the student concerned (Aryo Anggoro & Eko Adi Lukmana, 2019). At SMP Alam Al-Karim Lampung, the process of submitting student grade information is still done manually, so there is often a delay in providing the required grade reports. This condition encourages researchers to design a system that can support student grade processing and report presentation more quickly and accurately. SMP Alam Al-Karim Lampung is a private school located in Pinang Jaya Village, Kemiling District, Bandar Lampung City. Based on observations, the process of recording student grades for grades VII to IX at SMP Alam Al-Karim is still done manually, namely by using physical documents such as report books which are then archived by the administration. This manual process is a challenge for parents who want to monitor their children's academic progress remotely. With this background, researchers are motivated to conduct this research.

The purpose of this research is to design and implement a website-based report card system that facilitates and increases the effectiveness of recording student grades by subject teachers. To achieve this, the Rapid Application Development (RAD) method was used. RAD is considered the most suitable approach for this system because it emphasizes rapid prototyping, iterative development, and active user involvement, allowing the system to be developed efficiently while accurately meeting user needs (Beynon-Davies et al., 1999a; Sommerville, 2011) . This method allows developers to adapt quickly to feedback and changes during the development process, which is especially important for academic systems that require flexibility and precision (Sommerville, 2011) . Therefore, RAD was chosen as it offers speed and adaptability, ensuring the resulting system effectively meets the needs of schools in managing student report card data.

RESEARCH METHODS

Researchers collected data through observation and interview techniques. The observation method is an activity of observing an object directly and in detail with the aim of obtaining information about the observed object (Aryadi & Margunayasa, 2022) . In general, observations must be carried out systematically and the results can be accounted for (Andryani & Budiman, 2022) . In addition, the objects observed in observation must be real and observed directly (Masturoh & Mahmudi, 2023) . In addition to observation, researchers also use the interview method. Interview is the process of obtaining information that aims to support research, conducted through questions and answers between the interviewer and the respondent or resource person using an interview guide as a reference (Rachmawati, n.d.) . The research stages carried out by researchers are described as follows:

Design

In this study, the system was developed using the Rapid Application Development (RAD) method. In the early stages, namely requirement planning, researchers analyzed the report card processing system that had been running previously at SMP Alam Al-Karim Lampung. Based on the problems found, researchers then analyzed the need to build an information system in the form of website-based report card development.
The general description of the RAD method used can be seen in Figure 1 below.

Figure 1. Rapid Application Development

Based on Figure 1, Rapid Application Development (RAD) is defined as a software development process model that belongs to the incremental technique (Perdananto & Kurniawan, n.d.). This method emphasizes short, short, and fast development cycles (Beynon-Davies et al., 1999b). The short time limit is one of the important factors in the application of this model. Rapid Application Development uses an interactive (iterative) method in system development, where a working model of the system is constructed at an early stage to assist in setting requirements (Putri Nugraha et al., 2022) . The stages of application development in each RAD phase are as follows:

Requirement Planning

At this stage, users and system analysts meet to identify the main objectives of the

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application or system to be developed and determine the information needs required based on these objectives. The main focus in this phase is to formulate solutions to existing problems in the school. Although information systems and technology can influence the form of system design, the main focus is still directed at achieving school goals.

Based on the results of identifying user needs, it was found that the school needed a system that could facilitate recording student grades, managing teacher data, student attendance, and preparing report cards automatically. In addition, the system is also expected to be accessible online, making it easier for parents to monitor their child's academic progress in real time. This need arises because the current process is still manual and inefficient, resulting in potential recording errors and delays in presenting academic information.

Workshop Desain RAD (RAD Design Workshop)

This is the phase of designing and improving the system through workshop mechanisms. System Design and Development Analysts and programmers work together to build and present a visual representation of the system's design and working patterns to users. These design workshops can last for several days, depending on the level of complexity of the application being developed. In this research, web application development was conducted using the PHP programming language by utilizing the Laravel framework, which is known for its systematic development structure, good security features, and extensive community support. The development process is carried out in a team, consisting of system analysts, programmers, and testers, where each team member has a clear role in the stages of needs analysis, system design, code development, and application testing. In building this system, a MySQL database is used to store academic data such as teacher data, student data, subject grades, attendance, and report card data. During the workshop, users provide feedback on the prototype, and analysts refine modules based on the feedback.

Implementation

In the implementation phase, analysts work intensively with users during workshop sessions to design business and non-technical aspects related to the school's needs. Once these aspects are approved, the new system or part of the system is tested and then formally implemented in the school environment.

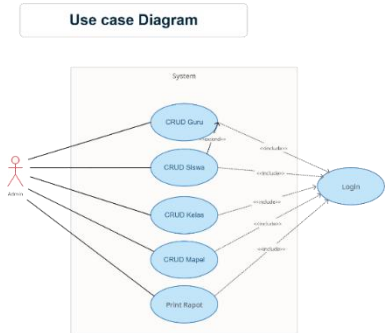
System Testing Method

Black Box Testing is a testing method that focuses on software functionality, namely the behavior of software against user-given input to produce the desired output, without regard to internal processes or executed program code (Febiharsa et al., 2018) . In every software development, a systematic testing strategy includes planning, implementing, and controlling tests, starting from small elements of the software to cover the entire program. The main purpose of software testing is to find errors (Aji & Pratmanto, 2021). In this study, researchers used the Black Box Testing method as a software testing technique. This test focuses on testing the functional requirements of the system. Through this technique, a number of input conditions can be created to test all functional requirements set on the program (Murdiani & Sobirin, 2022) . Some categories of errors that can be found through this test include:

1) Functions that are not working properly or functions that are missing.
2) Interface errors.
3) Errors in data structure or access to external databases.
4) Errors in system behavior or performance.
5) Errors during the system initialization or termination process.

Use Case Diagram

Use Case Diagram is a diagram that describes the relationship between users (actors) and use cases in a system (Munawarah et al., 2024). Use cases are used to describe how one or more actors interact with the information system to be developed. Use cases serve to identify the functions contained in the information system and determine the parties who have access rights to these functions (Olusegun, 2025) . The following diagram presents a visual representation of the Use Case Diagram used in the development of this system.



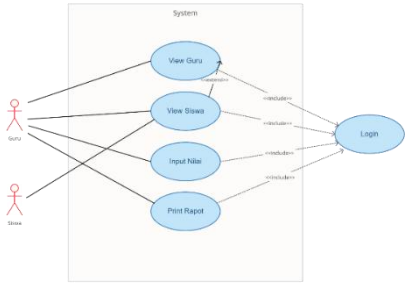


Figure 2. Use Case Diagram

This Use Case diagram illustrates the interaction between admins, teachers, and students in a web-based report card management system at SMP Alam Al-Karim. This system was developed using the Rapid Application Development (RAD) approach which emphasizes prototyping, testing, and rapid improvement based on user input. In this system, the admin plays a role in managing user data, student data, class data, and verifying the grades inputted by the teacher. Admin has the authority to add, edit, delete, and validate data after going through the login process. Teachers are tasked with logging in, inputting student grades, as well as editing, deleting, and rechecking grades before being sent to the admin for the verification stage. Students are required to log in or register to be able to access report cards, view grade details, graduation status, and confirm or submit grade revisions if needed. The include relation in the diagram describes the relationship between processes, while the extend relation shows additional scenarios, such as data validation or correction. The application of the Rapid Application Development (RAD) method allows system development to take place more quickly and adaptively to needs through continuous user feedback.

RESULTS AND DISCUSSION

Potential and Issues

The implementation of a web-based system in managing report cards at SMP Alam Al-Karim is expected to increase data validity and reliability, as well as provide real-time information on student academic progress. Through this system, teachers can monitor student performance more efficiently and provide feedback more quickly and on target. In addition, by using a computerized system, schools can reduce and even minimize various administrative problems, because all data can be managed and monitored more neatly, systematically, and easily accessible (Fitriani et al., 2018).

Data Collection

The data collection stage begins with conducting interviews with stakeholders to obtain relevant information related to system needs. This interview is an important method in data collection because it allows researchers to interact directly with respondents to gain a deeper understanding of their perceptions, perspectives, and experiences regarding the management of student report cards. In addition, observations were made of the ongoing report card management process at SMP Alam Al-Karim. This observation aims to find out the real conditions and understand user interactions with the manual system used previously. Through direct observation, researchers can obtain accurate and valid data regarding the use of the system, obstacles that arise, and user responses to the process. Observation serves to provide direct insight into the context of system use, and helps researchers gain a more comprehensive understanding of the phenomenon under study (Susanto et al., 2024).

Application Implementation Results

1) Login Menu
The login menu is designed to ensure that administrators, administrative staff, teachers, students, and principals must first authenticate before they can access the system. At this stage, users are required to enter a username, password, and choose the type of login according to their respective roles. The login menu can be seen in Figure 4.

Figure 4. Login Menu

Based on Figure 4, the login menu on the student report card development website at SMP Alam Al-Karim Lampung functions as the main gate for all users to access the system. On this page, users such as administrators, teachers, students, and student guardians are required to enter a valid username and password before they can continue into the system. This login feature is designed to maintain the security of student grade information, so that only registered accounts are given permission to access the data. If the login information entered does not match, the system will automatically display an error message and deny access to the next page.

2) Dashboard Menu

general information about SMP Alam Al-Karim Lampung. This dashboard menu display can be seen in Figure 5.

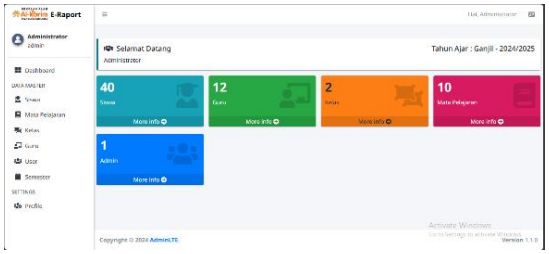


Figure 5. Dashboard

Based on Figure 5, the dashboard menu on the student report card development website functions as an initial display that presents important information in a concise manner. On this page, users can view student data, grade filling progress, report card distribution schedule, and notifications related to the system. This dashboard display is designed to make it easier for users to access information directly, so that data management consists of 40 students, 12 teachers, 2 classes, 10 subjects, and 1 system management admin can be done more easily, quickly, and organized. Thus, the process of inputting student grades becomes more efficient and systematic.

3) Teacher List Menu The teacher list menu is designed to allow teachers to see the teaching schedule for each class and give grades to students according to the available schedule. The display of the teacher list menu can be seen in Figure 6.

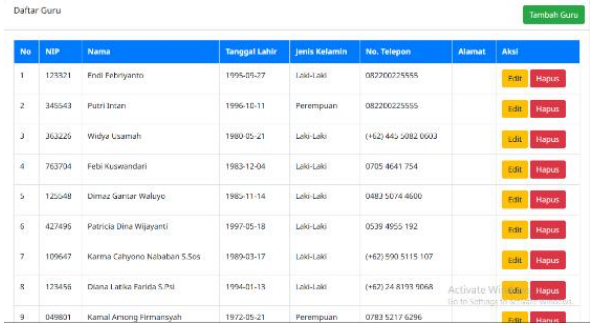


Figure 6. Teacher List Menu

Based on Figure 6, the teacher list menu on the website for developing student report cards at SMP Alam Al-Karim Lampung functions to display information related to all teachers registered at the school. Through this menu, users can access data such as the teacher's name, the subjects taught, and the teacher's active or inactive status. This feature makes it easier for the admin to manage teacher data and ensure that each teacher is connected to the relevant classes and subjects in the system.

4) Student List Menu

The student list menu is designed so that students can access the class schedule and view grades in each subject based on the school year. The display of the student list menu can be seen in Figure 7.

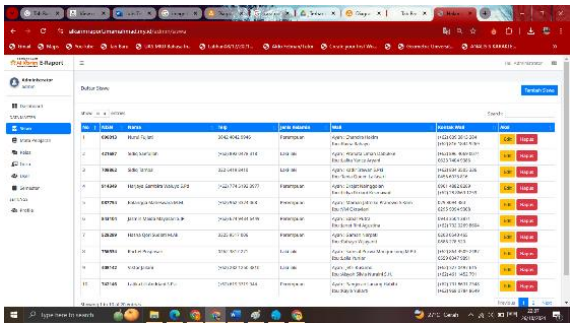


Figure 7. Student List Menu

Based on Figure 7, the student list menu on the student report card development system functions as a feature that displays student data that has been registered at the school. Through this menu, users can access information such as

student names, student identification numbers, classes, and student activeness status in the system.

5) Student Report Card Input Menu
The student report card input menu is designed so that teachers who have status as homeroom teachers can provide an assessment of the student's personality. The display of the student report card input menu can be seen in Figure 8.

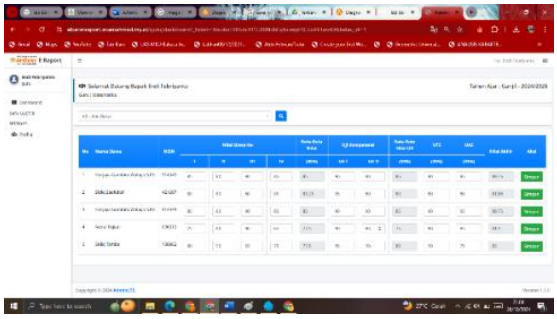


Figure 8. Student Report Card Value Input

Based on Figure 8, the report card score input menu on the website for the development of student report cards at SMP Alam Al-Karim Lampung serves as a means for teachers to fill in and update student grade data according to the subjects taught. Through this feature, the grade input process can be done more practically and structured, according to the selected class and semester. The existence of this menu plays a role in minimizing errors in recording grades and accelerating the assessment administration process in the school environment.

6) Student Report Card Results Menu
This student report card menu presents the end of semester results, where the homeroom teacher is responsible for summarizing all student grades and compiling them into a report card book. The display of the student report card results menu can be seen in Figure 9.

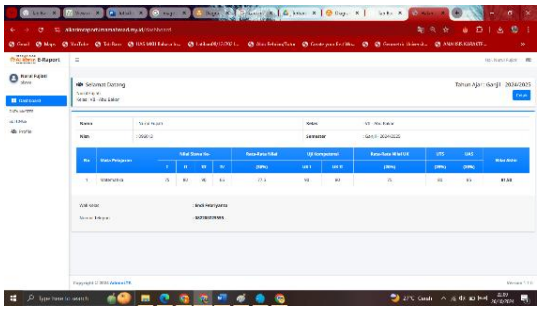


Figure 9. Student Report Card Results Menu

Based on Figure 9, the student report card results menu on the website for developing student report cards at SMP Alam Al-Karim Lampung functions to display a summary of grades that have been entered by teachers in the student report card format. Through this menu, students and parents/guardians can access and check the learning evaluation results for each semester, including details of grades for each subject and graduation status. This feature is designed to deliver academic information efficiently, accurately, and transparently.

Testing Results

Black box testing is a testing method focused on evaluating the external components of the software, including the user interface that has been designed (Sistem et al., 2024).

1) Website Testing Results
The results of testing the website that has been developed are presented in Table 1 below.

Component	Description
Feature Name	Login
Test Scenario	Ensure users can log in to the system with a valid account
Input	Valid username and password entered on the login form
Expected Output	The system directs the user to the dashboard page after a successful login
Test Results	The system successfully redirects to the dashboard
Conclusion/Status	**Successful** (features work as expected)

1) Survey Testing Results

Survey testing of the report card development website at SMP Alam Al-Karim Lampung aims to measure the level of user satisfaction with the performance and ease of access of the system. Through this activity, teachers, students, and guardians are given the opportunity to express opinions and input related to their experience in using the website, so that the results of this survey can be used as evaluation material for developers in an

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effort to improve the quality of the system in the future. The survey was conducted by involving 11 respondents, consisting of 1 school administrator, 4 subject teachers, 3 students, and 3 parents/guardians. Participation from various parties is important to get a comprehensive picture of the effectiveness of the system from the perspective of different users. The results of the survey testing are shown in Figure 10.

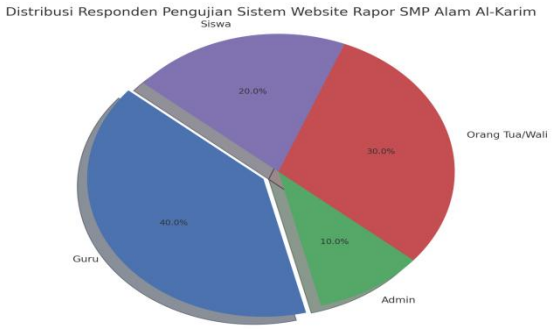

Figure 10. Survey Testing Results

Based on the results of survey testing, which was attended by 11 respondents, it is known that 14.7% of respondents stated that the recommendations provided by the system were very suitable for their preferences, while 7.35% of respondents stated that the recommendations were quite suitable. Referring to this data, it can be concluded that the majority of respondents gave positive responses and expressed satisfaction with the recommendations provided by the system.

CONCLUSIONS

Based on the results of the research conducted, it can be concluded that Alam Al-Karim Lampung Junior High School previously still used conventional methods in processing student report cards, namely by utilizing paper media. This manual process had several weaknesses, especially in terms of data security, such as the risk of loss or damage due to fire or misplacement. After the submission and implementation of the report card management website at the school, system testing was carried out through distributing questionnaires using Google Forms. Based on the survey results involving 11 respondents, 14.7% of respondents stated that the recommendations provided by the system were very suitable to their needs, while 7.35% stated they were quite suitable.

Importantly, the development process applied the Rapid Application Development (RAD) method, which proved to be highly effective for this project. RAD, which emphasizes fast prototyping and user feedback, enabled the development team to quickly deliver a functional system that met user expectations, adapt rapidly to input from teachers, parents, and students, and reduce the risk of misaligned system requirements. By involving users intensively during iterative development cycles, the system could be refined in a short time without sacrificing quality (Software Engineering: A Practitioner's Approach, n.d.). With the development of this website-based report card information system using the RAD method, it is expected to help and facilitate students and parents in obtaining report card information quickly and up-to-date. Furthermore, the system increases efficiency in searching and managing student grade data because all data is securely stored in the database, reducing reliance on physical records and improving overall administrative effectiveness.

ADVICE

Based on the results of research on the application of the Rapid Application Development (RAD) method in the development of a student report card management website at SMP Alam Al-Karim Lampung, researchers provide several suggestions to support future system development, as follows:

a. Feature Additions
   It is recommended that the system be equipped with an automatic notification feature, either via email or short message application, to make it easier for students and parents to obtain grade information quickly and on time.
b. Advanced System Testing
   Further testing is needed to ensure that the website can function optimally on various devices and platforms. In addition, it is necessary to test the compatibility and stability of the system, especially in conditions of simultaneous use by many users.
c. Security Enhancement
   It is necessary to strengthen the security system, especially in the login authentication process and student grade data management, to prevent potential data leakage or unauthorized access to important information.
d. User Training Program

Disarankan agar pihak sekolah secara rutin mengadakan program pelatihan atau sosialisasi bagi guru, siswa, dan wali murid, agar seluruh pengguna dapat memahami serta mengoptimalkan pemanfaatan fitur-fitur yang tersedia dalam sistem.

e. Periodic System Evaluation
Regular system evaluation needs to be done to ensure that this application remains relevant, can develop, and is able to adapt to the needs and changes in the grade management process in the school environment.

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