Implementation of Web-Based Student Report Card Score Information Systems in Junior High Schools in Indonesia

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Abstract
Education-related businesses are conducted by SMPN 286 West Jakarta. The traditional method of recording and processing student grade data by the concerned teacher frequently results in errors. Hence SMPN 286 intends to develop an integrated system for processing and recording student report cards. Report cards for students are delayed as a result, and processing and recording problems occur when grades are calculated. Record card It also takes a long time to process and record data values manually. The Rapid Application Development (RAD) method will be used to create a report card value information system based on a website. Compared to other ways, work done utilizing the Rapid Application Development (RAD) method is quick and effective; therefore, employing it to construct a report card information system website can be helpful. The SMPN 286 West Jakarta has issues that can be helped and resolved by establishing a website-based report card grade information system. Online information system based on report cards' grades. The concerned instructor does not need to manually process and record value data for students to reduce recording errors, process student report cards, and cut processing times for processing and recording value data.

Keywords: Student Report Card, RAD, Web-based, Information Systems, Junior High School.

1   Introduction

Information systems-related technological development is currently advancing quickly. In an increasingly interconnected world, not only has technology in information systems gone swiftly, but so has the internet. There are still some educational institutions that need to be appropriately utilizing technology. Due to inadequate facilities and workforce, for example, in the SMPN 286 West Jakarta environment, this technology still needs to be used. An organization that manages tasks associated with education is SMPN 286 West Jakarta [1] [2] [3].

The main objective of West Jakarta 286 Public Junior High School is to educate the nation's life because education is the key factor that allows a country to advance its human resources. "Good human resources will bring a nation to be more advanced and create a generation ready for technological change," states the school's mission statement. growing" [4][5].

To produce competent human resources that are dependable and equipped to manage technological breakthroughs in the 5.0 age, they must be supported by high-quality educational infrastructure and facilities. Facilities and infrastructure are critical or essential components to help students' teaching and learning processes and provide comfort as technology improves and is utilized more frequently. When processing grades manually using a gradebook. It would be difficult, slow, and error-prone to process and record student report card scores manually without a computer. For processing and recording value data, the 286 West Jakarta Junior High School adheres to standard practices[6][7].

Subject teachers traditionally rate students' work and produce report cards for the results[8][9]. After the teacher's value data has been processed, the student's value data is recorded to be used as a report card, and the report card results will be sent to students to determine the learning outcomes of these students for one year or two semesters.[10]. The standard procedure is to process and record student report cards. This approach has a high level of complexity because SMP 286 West Jakarta has 320 male students and 250 female students. It takes much time because traditional processing and recording of value data must be done correctly, and reviewing student value data one by one for the value that has been input and recorded as a report card value by the concerned instructor.[11].

A web-based system for tracking student report card scores will be implemented due to the issues identified at SMPN 286 West Jakarta. The PHP programming language and the RAD Rapid Application development methodology will be used to implement a web-based student report card score information system[12]. Implementing web-based student report card value information system at SMPN 286 West Jakarta, a research project named "Implementation of a Web-Based Student Report Card Value Information System at SMPN 286 West Jakarta" was undertaken in response to the issues that arose[13].

2   Methods

Education-related activities are carried out by SMPN 286 West Jakarta. As a result of frequent inaccuracies in the traditional method used by the teacher in question for collecting and processing student grade data, SMPN 286 seeks to develop an integrated system for processing and recording student report card grades. Report cards for students are delayed as a result, and processing and recording problems occur when rates are calculated. Reporting card Much time is also required for manual processing and recording value data[14].
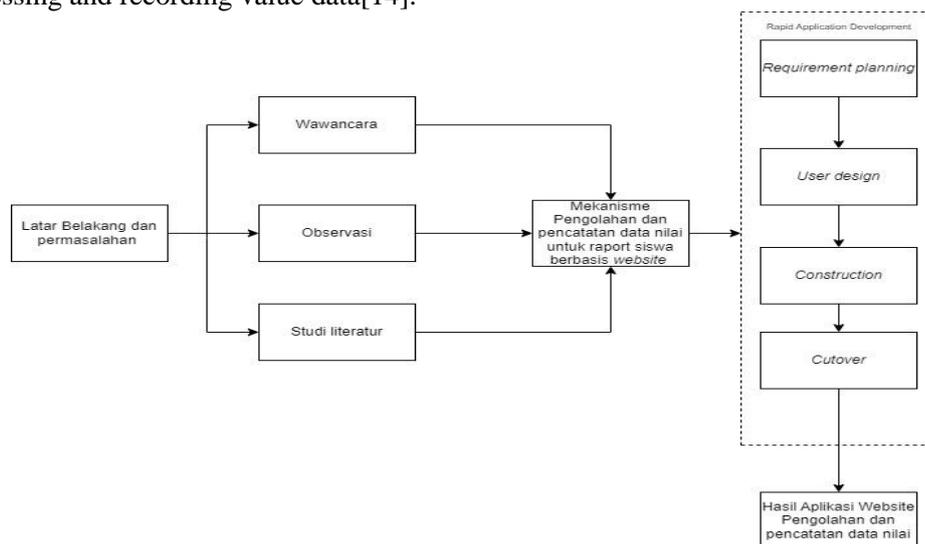

Figure 1. Research Framework

As shown in the study framework above, there are four steps in the Rapid Application Development (RAD) approach used to create this information system. Starting with the requirements planning stage, the design stage is where the production of use case diagrams, activity diagrams, and class diagrams is done. These four stages must be completed to manufacture this information system. After that, there is a stage called construction, during which programming is done. The location of introducing the system is the final one[15].

2.1. Rapid Application Development

Rapid Application Development is a technique that enables the rapid development of web-based applications to reduce the time required for designing and constructing websites. In contrast to the 190 days it typically takes to create an application, 30 to 90 days are needed to finish a software project using the Rapid Application Development method[15].
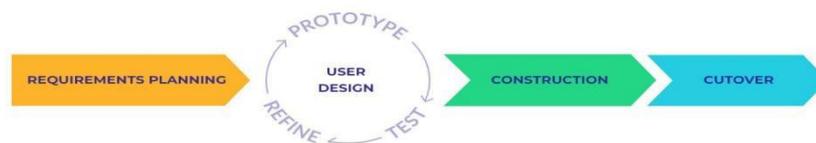

Figure 2. *Rapid Application Development*

The stages of requirements planning, user design, construction, and cutover are all parts of the rapid application development process. Below is a description of each of the four stages.

1. Requirements Planning

Requirements Planning is a stage in system development that identifies needs. Problems are discovered or identified during the planning stage, and user input is gathered to determine the

intended information system's primary needs or objectives. Both parties are required at the requirements planning stage, and interviews are held to ascertain the demands of system development and production. At the requirements planning stage, it involved three teachers, 1 school principal and 1 school admin. the purpose of involving teachers, principals and admins to meet the needs of the system for processing and recording the required value data.

2. User Design

User requirements are considered during the user design stage of system development, which includes database design, interface design, prototype design, and conceptual schematic configuration of the system to be built. These tasks fall into two categories during the user design phase: designing the system with users and user research. In the user design phase, users collaborate with principals, teachers and admins to choose the layout and design of the software, then build it together.

3. Construction

Software developed or created in a prior stage is at the construction stage, where it is created and perfected. Automated tools and data model conversion to produce the final operational output are two examples of software upgrades. The RAD construction phase receives a compilation of advancements and software adjustments. Feedback from the software being produced is gathered during the development process. Positive and negative comments are made about the software functions currently being developed.

4. Cutovers

Cutover is the final step in the Rapid Application Development (RAD) process. The features, functionality, interface, and everything else of the finished software product is finalized during the transition phase. Before handing over the program to the client, the features and interface developed are evaluated during the transition process to ensure proper performance and a testing phase is carried out using blackbox testing. The purpose of testing is to find bugs in the application when it is developed

2.2. Data Processing

The time spent demonstrating changes in the form of data into information that can be used later is called "data processing" [4]. All types of data changes transformed into useful information are called "data processing" over time. The three data processing steps are summarized in the table below[14]:

Figure 3. Data Processing

In data processing, there are three processes, namely Input, Processing, and Output. The following is an explanation of the three data processing processes:

1. Input : The first stage in processing data or information values is preparing input, which can take several forms and be modified for processing. In the value data processing application, the input that must be done is to input student data so that the grades can be processed by the teacher concerned according to the subject. Furthermore, the admin and teacher input and process grades.
2. Processing : The processing stage involves changing the input data and combining it with other data or different values to create usable data. after the value processing is carried out, the system will automatically record student report card grades according to the report card format that has been made.
3. Output : The results of the data processing were collected and issued in the output process to be used as information in the form of student report cards.

3   Result and Discussion

Based on the research methodology described in the previous section, system design and implementation of the RAD method into application web-based were carried out.

3.1 Requirement Planning

At this point, an interview with the SMPN 286 school administration was done to ascertain the issues with the needs and needs of users in this research. Making the system function following the relevant requirements is vital since the interview process was done with Mrs. Amelia, vice principal of SMPN 286. Table 1 contains the query and the findings following an interview with the vice principal of the school.

Table 1. Result of the Interview with the vice principal

Question	Answer
How difficult was it to manually process and record student report cards?	A grade input error that affects the student in question occurs when grades are manually processed. For instance, student (A) should receive an 85 since the teacher is distracted and processing scores for many pupils. The 85 points earned by the student (A) should be 74, and the currently entered amount needs to be manually altered. Misrecorded grades or grades duplicated with those of other students were challenges encountered in addition to processing faults in grades since hand-composing report cards required high accuracy to prevent errors. Grading student report cards manually require a significant amount of time and must be completed slowly.
Is there any history of manual processing and recording of report cards causing delays in the distribution of report cards?	Since grades were still recorded and processed in the traditional manner of providing late reports, SMPN 286 had to deal with the experience of distributing late report cards. Due to an issue with one of the teachers recording and processing grades, this happened the previous year. The value processing is still done manually, which causes these issues. The incident of handing out late report cards has occurred twice, in 2022 and 2021, and although it was significantly prevented, it may appear.
What is the difficulty level in manually processing and recording student report cards?	It is relatively easy to process grades because teachers are accustomed to doing so, but high precision is needed to process and record student grades. The computations are relatively easy, but processing and recording are still done manually; they are challenging.

3.2 System analysis and design

Workflows developed and created using the information design system will operate in this situation. Creation and development of workflows will be carried out using case diagrams, activity diagrams, and class diagrams.
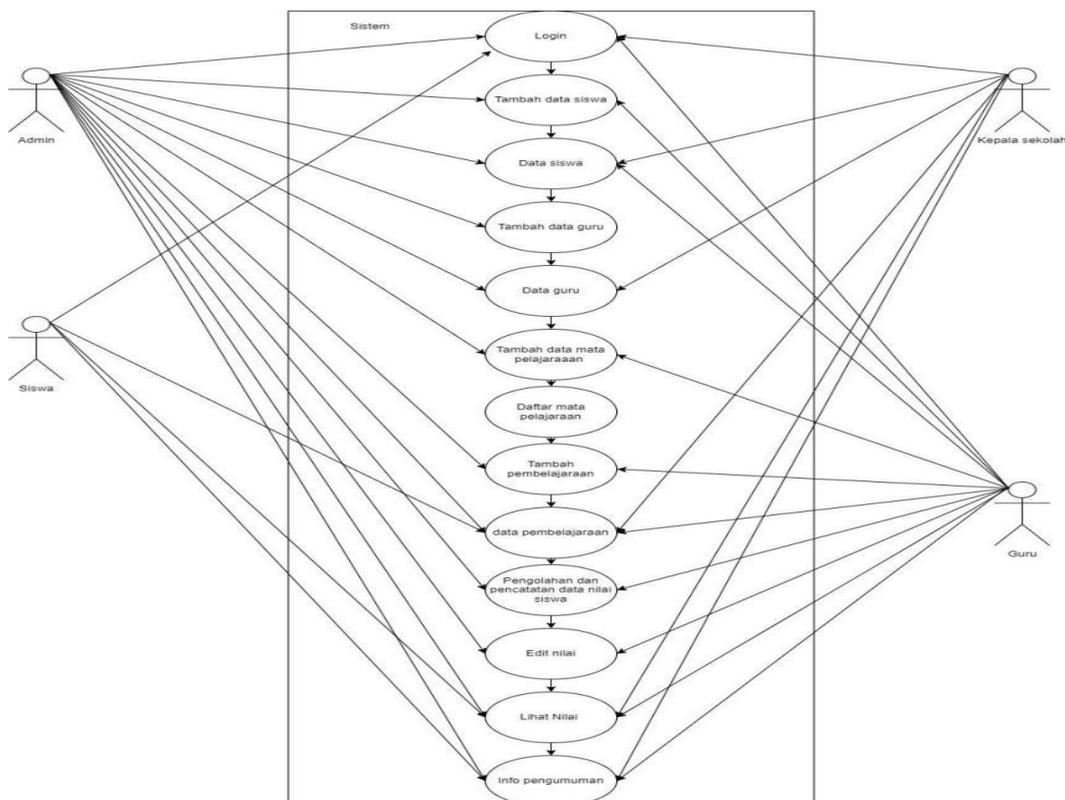
Figure 4. Use case diagram

Figure 5 depicts a use case diagram where it is possible to observe an administrator's actions in the scenarios shown in the use case pictured above.
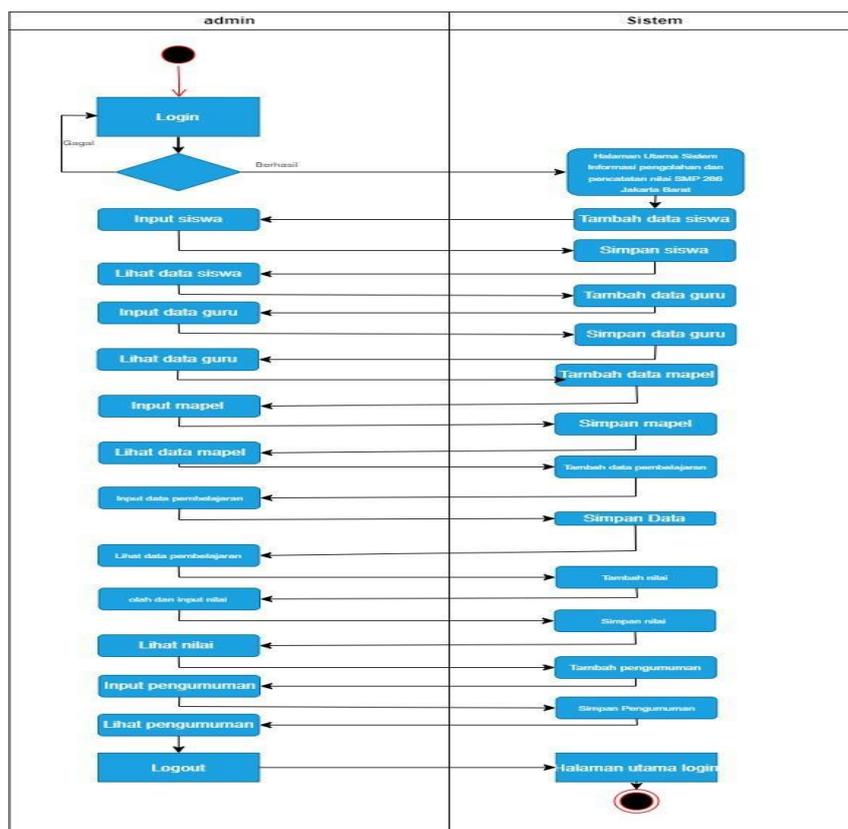

Figure 5. Activity diagram admin

A modeling diagram for a program is a class diagram. The classes included in the system that will be built to establish a website-based system for processing and recording student report card grades are explained by the class diagram in Figure 6. The use case diagram previously created serves as a guide for each actor's job.
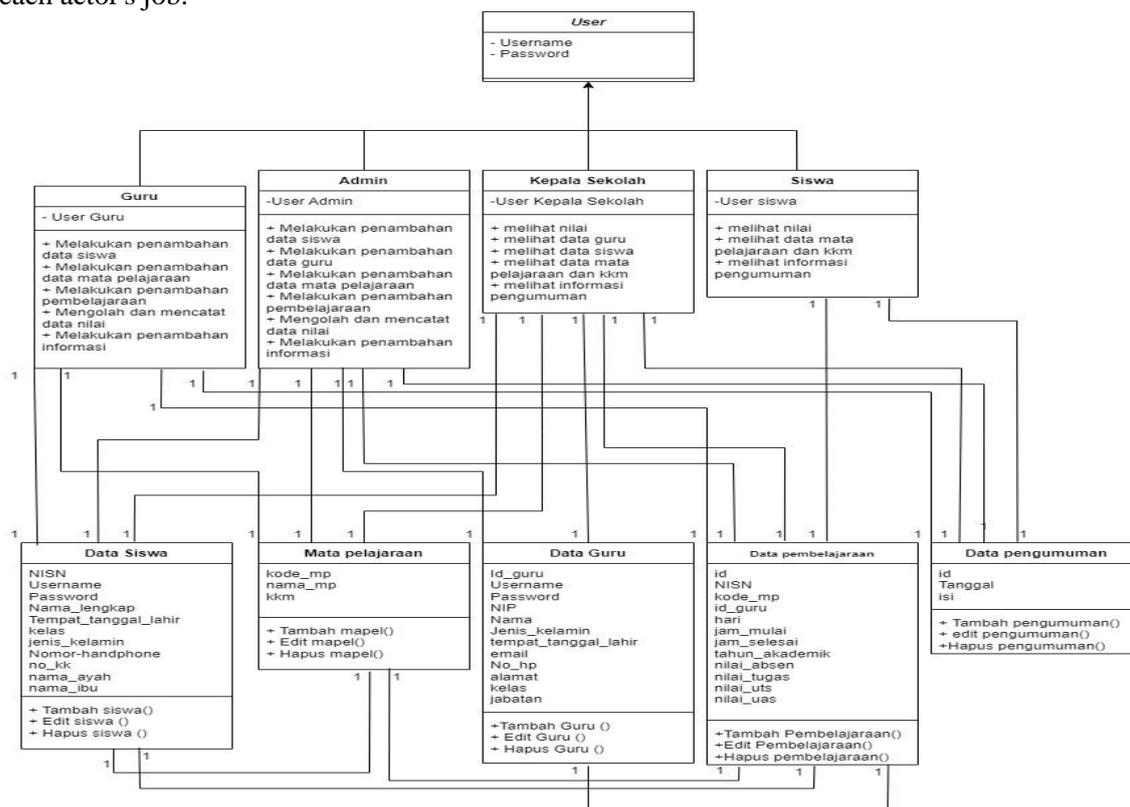

Figure 6. Class diagram

A class diagram is shown in Figure 6. To process and record student grade data at SMPN286 using a website-based information system, a relationship between objects is illustrated in the diagram above.

3.3 Construction Phase

As a result of this study, SMPN 286 now has access to an information system website that can process grades from report cards and record data. This screenshot shows the successfully developed smpn286 information system website.
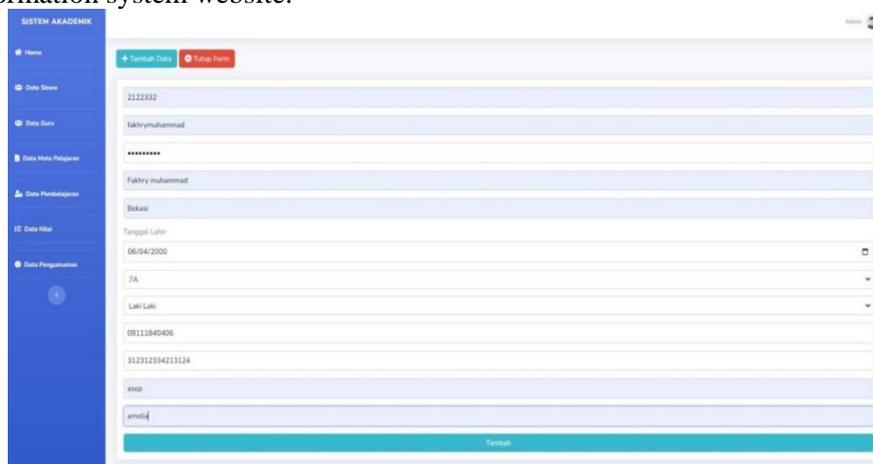

Figure 7. Student data page form added data

Figure 7 shows the page with student data. The admin and teacher can add data on the student data page by clicking the data button to enter student data. When you click the "add data" button, a form for admins and teachers to input data and enter student biodata will appear. The new data form includes the

student's NISN, username, password, complete name, place of birth, date of birth, class, gender, phone number, student family number, father's name, and mother's name. It also includes the student's course, gender, and parent's names. If the information has been correctly entered, click the add button, and the information will appear on the student data page and be saved in the database.
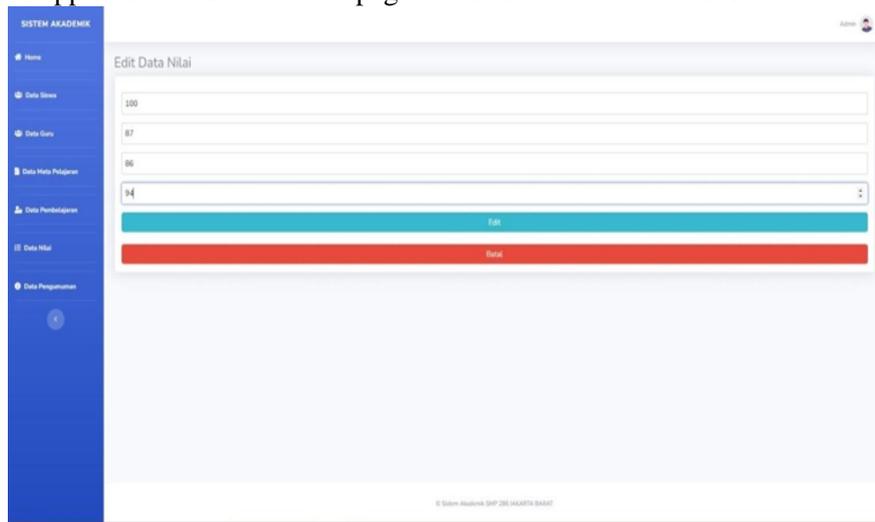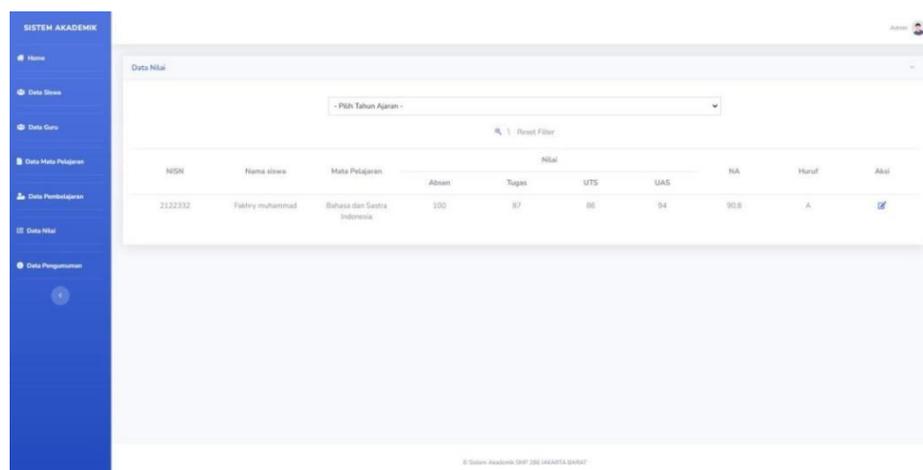

Figure 8. Value data page value processing format

The value data processing form on the value data page is shown in Figure 8. The value data form shows a value column that must be filled out by the administrator and teacher to be used as the final value displayed by the students. The value column includes information on students' attendance, assignments, final exams, and final exams. If the value data that has been input is accurate and will be added to and displayed, the admin and teacher should only enter attendance, assignment, final, and final scores. They should only click the edit button if the value data is incorrect. After that, the student value data will be stored in the database and displayed on the value data page.

Figure 9. A value data page is the result of value data processing

Figure 9 shows the value data page that the administrator and teacher completed. The value data page in the previous Figure 8 shows student names, student names, subjects, and student grades, is still blank, and the admin and teacher still need to finish processing the value data. The administrator and teacher entered and filled in the student scores in Figure 9. The processed student scores and the final grades students earned while participating in learning activities are displayed on the value data page. Suppose the student's score does not match the results that the teacher and admin should be able to change immediately by clicking the edit value logo. In that case, the system will display the value processing data form that the admin and teacher previously completed. The value data page can automatically display the results of the student's final score and the letters of the student's final score.
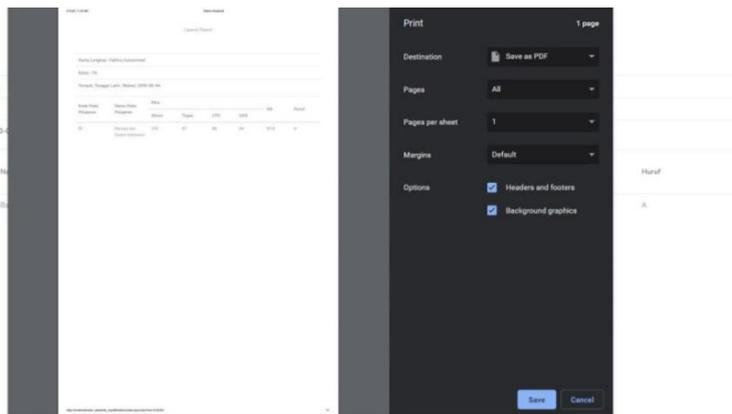
Figure 10. Report form

A report card print form that the administrator and teacher can use is shown in Figure 10. The processed and entered data from the value data page will be linked to the printed report card form, and the system will automatically record the grades following the SMPN 286 report card format. Report cards can be printed right away or first converted to PDF.

3.4 Testing Result

The next stage that needs to be completed is testing after the information system has been successfully built. Where is the process of testing the information system that was created to find out if there are problems or errors using blackbox testing according to the cutover phase of the RAD method.

Description	Case	Status
Admin Login	- Enter Username and Password - Click the Login Button	PASS
Student Data Menu	- Click the add data button to enter student biodata, student username, and password - Click the Print Report Button - Click the delete button - Click the filter button	PASS
Teacher Data Menu	- Click the add data button to enter the teacher's biodata username and password - Click the keyword search column - Click the Delete Button	PASS
Subject Data Menu	- Click the Add Data Button to enter subject data and KKM - Click the keyword search column - Click the delete button	PASS
Learning Data Menu	- Click the Add Learning Data Button to enter learning data - Click the search field - Click the delete button	PASS
Value Data Menu	- Click the value button - Click the filter column	PASS
Announcement Data Menu	- Click the add data button to enter the information announcement contained in the school - Click the search keyword column	PASS

4. Conclusion

By conducting this study, which lasted around four months at SMPN 286 West Jakarta, an information system for report card scores was developed to help teachers process and record grade data

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and make it simpler for students to access report card grades via the website. The information system was effectively developed following the demands made by the school. Some inferences can be made from the process that has been used, including:

1. The SMPN 286 West Jakarta school can organize student value data by using the system that has been developed. Data on student performance that was before not adequately maintained and not cleanly arranged are now correctly stored in the design and database.
2. A report card grade information system based on a website may assist schools, particularly teachers, in processing and recording value data methodically through the developed website. The involved teacher does not need to process and record value data manually to reduce recording errors, process student report cards, and cut processing times for processing and recording student value data.
3. The report card grade website system has an automatic feature to record the outcomes of student grade data that may be immediately recorded in the report card format. The involved instructor can skip physically registering student report cards because they may immediately process grades using the system on the internet, and the design on the website will automatically record the results of the steps included in the report card. This function can reduce the time needed to manually record student report cards and inaccuracies and delays in report card distribution.

Acknowledgment

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