



Design of a Web-Based Report Card and Academic Agenda Information System using the Agile Methode at SD Negeri 067260 Medan

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Abstract

A school is a system made up of elements that are interconnected and influence each other to achieve a single goal. The processing of school academic data carried out manually is ineffective because there are still many errors. This research aims to help improve the efficiency of academic data management, the accessibility and accuracy of academic information, as well as the participation of students and teachers in academic data management at SD Negeri 067260 Medan. In this study, the author designed a website-based report card and academic agenda information system using agile methods consisting of planning, design, coding, and testing. The results of this research are a website-based report card information system and academic agenda.

Keywords: Academic Information System, Report Card and Academic Agenda, Agile

1. Introduction

A school is an organization made up of interconnected and interdependent elements that influence each other to achieve a common goal. To achieve these goals, schools process complex and dynamic data. Manual processing of school academic data is ineffective due to the high frequency of errors. An academic information system offers a solution for more effective data processing [1], particularly regarding report cards and academic agendas. A web-based academic system can assist teaching staff in processing school academic data, such as student grades, attendance, and class schedules [2]. This system can help teachers and parents access academic information more easily and quickly.

The underlying problem in this research is the difficulty in processing academic data at Medan Public Elementary School 067260. Currently, academic data processing is still done manually, making it prone to errors in calculating grades, assessing, and managing student data. Furthermore, academic data processing can also make it difficult for teachers and parents to access the information they need [3].

To address these issues, this research will utilize Agile methods to develop a web-based report card and academic agenda information system. The Agile method includes procedures: planning, implementation, testing, documentation, deployment, and maintenance [4]. Furthermore, the Agile method can also help increase the participation and involvement of teachers and parents in system development.

The following are several relevant studies conducted by the author on previous research that addressed the topic of designing web-based information systems using Agile methods and similar methods [5]. Research conducted by J. Afriliano et al. in 2022 used Agile methods to design a web-based academic information system at Assibyan Early Childhood Education (PAUD) in Serang, Banten. This website was created using the Extreme Programming Model system development method because this method significantly supports flexibility in application development. This research successfully created a design that met the functions and needs [6].

Subsequent research conducted by Naufal Rafianto, Dimas, and Saifulloh in 2021 used Agile methods to apply the Scrum method to create the User Experience Landing Page for the Lentera Information System. They used the Unified Modeling Language (UML) model for the development of the model. The final result of the above research is a web-based academic information system that can provide optimized information services [7]. The author chose the Agile method, because it is very suitable for use in designing and building website-based applications. The Agile method runs smoothly and effectively. The difference between this research and previous research [5] is the case

study and model used using the Agile approach model. This research is to make it easier for teaching staff and administrators to manage student data, academic agendas, final student grades, lesson schedules, and make it easier for parents to access report card information.

2. Literature review

2.1. System

Broadly speaking, a system is an organization of a collection of components and elements that are integrated and work together to achieve a specific goal. According to Sutanto Djahir and Pratita (2015), "A system is a collection of components or subsystems, both physical and non-physical, that are interconnected and work together harmoniously to achieve a specific goal"[8].

According to Jogiyanto (2008), systems can be viewed from two groups of approaches: procedural and component-based:

1. Based on procedural emphasis, a system is a network of interrelated procedures that work together to carry out activities or achieve a specific goal.
2. Based on component-based emphasis, a system is a collection of related elements that work together to achieve a specific goal [9].

2.2. Information

According to Hartono (2013:34), information is a collection or set of data that has been processed into something that has greater and broader meaning and benefits.[9] Information is data that has been processed into a form that is useful and more needed by the recipient. Information has several characteristics, including:

1. Relevant
In this case, the information conveyed must be relevant to what is needed.
2. Reliable
In this case, the information produced must accurately describe the events or activities that occurred and be free from errors or deviations.
3. Complete
In this case, the information must be complete without omitting the data needed by the recipient.
4. Timely
In this case, information must be provided to the recipient in a timely manner.
5. Understandable
In this case, information must be presented clearly and easily understood.
6. Verifiable
In this case, the information obtained must be the same as the information obtained [10].

2.3. Information systems

According to Krismaji (2015:15), an information system is an organization of procedures for collecting, entering, processing, and storing data, as well as an organization of procedures for storing, organizing, controlling, and reporting information to achieve predetermined goals. An information system is a collection of several systems within an organization that collect, process, store, and distribute information to support decision-making and control within the organization [11]. Information systems have components such as hardware, software, data, and procedures [12].

2.4. Report cards

Report cards are a form of school accountability to the community regarding student abilities. They consist of a collection of assessment results, student intelligence, and academic achievement at school. They serve as official reports from teachers to parents in book form [13]. Electronic report cards (e-report cards) are a digital system used to manage, compile, and distribute student learning outcomes electronically. E-report cards are designed to replace conventional methods with information technology, making the assessment process, student data management, and communication of learning outcomes more efficient, transparent, and accurate. E-report cards have the following characteristics:

1. Data digitization
Student learning outcome information is managed digitally using specific applications.
2. Interactive
Allows interaction between teachers, students, and parents through an integrated platform.
3. Automatic recapitulation
Assessment and analysis of learning outcomes can be summarized automatically, reducing the risk of manual errors.
4. Accessibility
Data can be accessed online anytime and anywhere by authorized parties.
5. Data Security
Has features to maintain student data confidentiality and prevent manipulation [14].

2.5. Agenda

According to Sallis (2014), structured academic planning through an agenda can improve the effectiveness of educational operations by ensuring all activities are carried out according to the specified schedule. The academic agenda acts as the primary guideline for all parties involved in the educational process [15]. An academic agenda is a series of scheduled activities to organize various academic activities over a specific period, such as a semester or academic year. This agenda includes the schedule for teaching and learning activities, exams,

academic guidance, and other non-academic activities relevant to the educational institution. The academic agenda has several main components, including:

1. Core activities
The schedule for teaching and learning activities, exams, grading, and academic guidance.
2. Supporting activities
Seminars, workshops, training, and skills development.
3. Non-academic activities
Competitions, festivals, or extracurricular activities that support the student experience.
4. Evaluation period
Important dates such as the end of the semester, report card submission, or teacher/lecturer and student performance assessments [16].

2.6. Academic information system

According to Siti Ida Faiza Kurnianingsih and M. Yasser Arafat (2020:204), "An academic information system is an information system designed to more easily control the processing and presentation of academic data. It is used by all school units, including the principal, teachers, staff, students, and guardians." An academic information system is built on components consisting of student, teacher, and other data that are interconnected to form a system [17].

In an academic context, an academic information system is the implementation of the above theory in education management.

The main components of an information system that interact with each other are:

1. Data Input
The process of collecting data such as student biodata, grades, and schedules.
2. Processing
The processing of data into useful information, such as class schedules, transcripts, or statistical reports.
3. Output
The presentation of information through reports, dashboards, or portals.
4. Feedback
A data evaluation and updating system to improve the accuracy and relevance of information [18].

2.7. Agile method

The author chose the Agile method as the development approach. Agile is a system development approach that is responsive and adaptive to changing user needs [19]. The Agile method consists of six stages:

1. Planning
In the Agile method, the initial stage of development is planning the requirements for creating an application/website.
2. Implementation
In this stage, the system is implemented based on the plan. The report card and academic agenda website uses the PHP programming language, the Laravel framework, and MySQL for data storage.
3. Testing
In this testing stage, an evaluation of the report card and academic agenda website is conducted. Any bugs found can be immediately fixed.
4. Documentation
This stage is carried out to facilitate the future maintenance of the report card and academic agenda website.
5. Deployment
This stage is carried out to ensure the quality of the website. If the report card and academic agenda website meets the development requirements, development will proceed.
6. Maintenance
Maintenance is the final stage in this process. Maintenance will be carried out periodically, including fixing errors and adding new features if needed [4].

2.8. Previous research

Previous research discussing the design of a web-based academic information system using Agile methods was conducted by Naufal Rafianto, Dimas, and Saifulloh in 2021. This involved implementing the Scrum method in developing the User Experience Landing Page for the Lentera information system using Agile methods. The study resulted in the optimization of information services using a web-based information system. An evaluation using the SUS Questionnaire on 19 students for system user experience yielded an average score of 73,

with a "good" rating and a B grade [20]. Subsequent research was conducted by J. Afriliano et al. in 2022. The study results showed that the Extreme Programming Model, an Agile development method, supports flexibility in application development [6].

3. Research methods

3.1. Data collection methods

In collecting data for designing this report card and academic agenda information system, the author used several methods, namely:

- a. Interviews
Interviews were conducted with the principal, administrators, teachers, and parents to obtain information about their needs and expectations for a web-based report card and academic agenda information system.
- b. Observations
Observations were conducted to monitor the academic data processing process at SD Negeri 067260 Medan.
- c. Literature Review
A literature review was conducted to explore theories and concepts related to a web-based report card and academic agenda information system and agile methods.

3.2. System analysis

The system analysis in this study is divided into three parts:

- a. Current system analysis, which analyzes the current system, specifically the system used to manage report cards and academic agendas.
- b. Analysis of the proposed method, namely the agile method, by outlining the simple, collaborative, responsive, and efficient working methods of this method in managing report cards and academic agendas.
- c. Analysis of the proposed system, which describes the proposed system model to be built using a Use Case Diagram.

3.3. System design

The system design in this study was conducted using the PHP programming language and a MySQL database for data storage. The Agile methodology was used.

4. Research result

The research results in the development of a website-based report card and academic agenda information system using Agile methods. In this stage, the author discusses the final appearance of the website-based report card and academic agenda information system. The following are some of the results of the website-based report card and academic agenda information system: The research results in the development of a website-based report card and academic agenda information system using Agile methods. In this stage, the author discusses the final appearance of the website-based report card and academic agenda information system. The following are some of the results of the website-based report card and academic agenda information system:

1. Initial or login screen

The initial or login screen shown in Figure 4.1 is the first screen that appears when the website-based report card and academic agenda information system is launched.

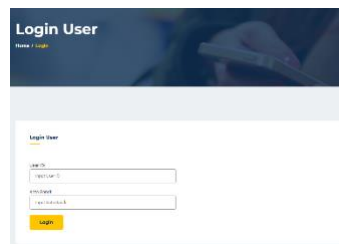


Fig. 1: Initial or login screen

This page features a login button, which can be accessed by registered users. Users can access the next page by entering their registered user ID and password.

2. Student menu display

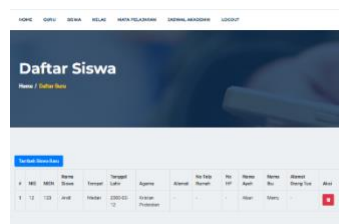


Fig. 2: Student menu display

3. Class menu display

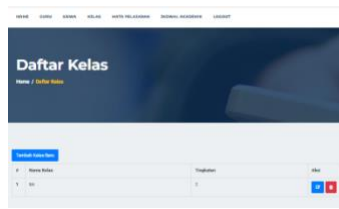


Fig. 3: Class menu display

4. Teacher menu display



Fig. 4: Teacher menu display

5. Subject menu display



Fig. 5: Subject menu display

6. Academic schedule menu display



Fig. 6: Academic schedule menu display

7. Report card grades menu display

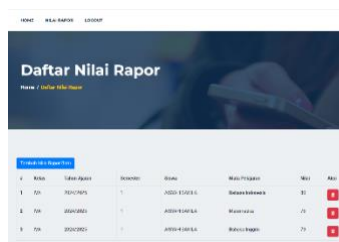


Fig.7: Report card grades menu display

8. Student academic schedule menu display

Fig. 8: Student academic schedule menu display

9. Student report card grades menu display

Fig. 9: Student report card grades menu display

5. Conclusion

Some conclusions that can be drawn from the design of a website-based report card and academic agenda information system using Agile methods are as follows:

1. The report card and academic agenda information system is designed to assist administrators in managing school academic data and teachers in entering students' final grades.
2. The report card and academic agenda information system is designed to assist parents in flexibly accessing information regarding student report cards and the school's academic agenda.
3. The report card and academic agenda information system is designed using Agile methods.

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