

Design of A Mobile And Web-Based Academic Information System

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SD Negeri 02 Pegiringan is one of the elementary schools in Pemalang. Currently, SD Negeri 02 Pegiringan is still using the 2013 elementary school curriculum, and has earned an A accreditation rating in 2022, the problem faced by SD Negeri 02 Pegiringan at this time is that parents cannot always monitor their children's grades, so they are less aware of their development. In addition, the report card data processing process still relies on the use of Excel manually. Based on these problems, this research builds a mobile web-based academic information system application. With this academic information system, it can simplify the process of checking, recording, and reporting student grade data in a computerized manner. The system design in the application utilizes the UML (Unified Modeling Language) methodology, and will be implemented with PHP (Pear Hypertext Preprocessor) as a programming language for web and Dart for Android, MySQL as a database server, with the data processed is student data, teacher data, grade data, class data, grade data, and subject data.

Keywords: Mobile, Information System, Unified Modeling Language

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1 Introduction

SD Negeri 02 Pegiringan, a primary school located in Pemalang district, Central Java, has been an important educational institution since its establishment in 1969. With a student population of 110, the school implements the 2013 elementary school Curriculum. Facing the digital era, in 2022, the school built a website to provide school-related information, but the website still lacked sufficient interactive features.

One of the main challenges faced is the difficulty of parents in monitoring their children's academic progress efficiently and effectively. The process of recording and processing student grades is still done manually using Microsoft Excel, which is not only time-consuming but also prone to errors. To overcome this problem, SD Negeri 02 Pegiringan took the initiative to design a mobile web-based academic information system. This system is designed to facilitate the monitoring of students' grades and academic progress, with the hope of providing an efficient and transparent solution for teachers and parents.

In developing this system, the school utilized the Unified Modeling Language (UML) method for design, as well as using PHP programming language with CodeIgniter 4 Framework for web development, and Dart with Flutter Framework for Android application. MySQL was chosen as the database to manage information about teachers, students, grades, classes, and subjects. This research will also explore how the application of information technology can provide benefits in the context of education, as well as the chal-

lenges that may arise in the implementation process.

Taking into account the specific conditions and needs of SD Negeri 02 Pegiringan, this research aims to not only provide suitable technological solutions but also provide insights that can be useful for other schools facing similar challenges in managing academic information.

The novelty of the article seems to center around the development of a web-based and mobile academic information system for a specific school, SDN 02 Pegiringan. While the concept of digital academic systems is not new, the specific application to this school and the potential customization to meet its unique needs could offer a novel aspect. However, the extent of this novelty would depend on how the system differs or improves upon existing solutions in similar educational contexts.

The objectives of the article appear to be well-defined. The primary goal is to design and implement a functional academic information system tailored to the needs of SDN 02 Pegiringan. This objective is practical and focused, providing a clear direction for the study. However, elaborating on how these objectives align with broader educational technology goals or address specific challenges faced by the school could strengthen this section.

The method involves system analysis, design using UML (Unified Modeling Language), and implementation using PHP (with Framework Codeigniter 4) for web and Dart (with Framework Flutter) for Android applications. This approach is methodologically sound, employing standard tools and practices in software development. The inclusion of black box testing indicates a commitment to quality and functionality in the system development process.

The scientific impact of the article primarily lies in its practical application in the educational technology field, specifically in creating tailored academic information systems for schools. The conclusion that the system is functional and beneficial for SDN 02 Pegiringan underscores its potential positive impact on the school's academic management.

2 Theoretical Foundation

2.1 School. In the context of realizing the goals of national education which aims to form the next generation of nations that will continue the development of the Indonesian state,

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schools are formal educational institutions that play a central role[1]. From this definition, schools, becomes a learning center that provides various opportunities and environments that allow learners to develop their potential and competencies holistically. Schools are not only a place to gain academic knowledge, but also a place for the development of social, creative, physical and moral aspects. Through a structured curriculum and varied learning methods, schools serve as a vehicle to shape character, leadership, and an attitude of responsibility towards society and the environment. Thus, schools become an important foundation in forming qualified individuals who are ready to face challenges and advance the Indonesian nation in a better direction.

2.2 Application. Application is a software (software) that serves as the front end of a system that is used to process various kinds of data so that it becomes useful information for its users and also related systems[12].

2.3 Report. According to KBBI, a report card or report card is a book containing the value of students' intelligence and learning achievements at school, functioning as an official report from the teacher to the parents of students who are required to receive it. The report card itself is one of one of the school's responsibilities to the community about the abilities it has. The main function of evaluating student learning outcomes in general is to measure the level of student progress in learning, to develop further learning plans and to improve the learning process[2].

2.4 Flutter. Flutter is a cross-platform application development framework developed by Google. The following are some basic concepts relevant to understanding Flutter.

2.5 Web Server. Web server is a software that provides data-based services and functions to receive requests from HTTP or HTTPS on known clients and usually familiar with the name web browser (Mozilla Firefox, Google Chrome), the web server is also a computer used to store web documents, this computer serves requests for web documents from its clients[6].

3 Research Methodology

3.1 Data Obtained. From the results of the data obtained from this study in the form of a daily grade formulation which is a reference in system development. The process of managing report cards at SDN 02 Pegiringan is carried out by homeroom teachers and subject teachers. Each class from grade I to grade VI has its own homeroom teacher. Each homeroom teacher teaches all subjects except English, Physical Education, Islamic Religion, Catholicism and Christianity. Because these subjects will be taught by subject teachers.

3.2 Data Collection Technique. The data collection process in this final project research consists of 4 stages as follows: Observation, Interview, Data Source, and Data Collection Location.

3.3 Research Stages. From the problems that arise above, this research aims to design a system to overcome the problems that occur in the current condition. The research stages can be seen in the Figure 1.

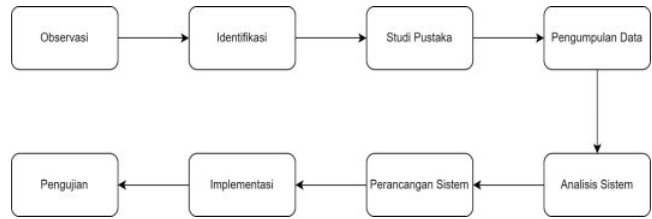


Fig. 1 Research Stages and Figure

3.3.1 Initial Conditions. Based on the results of previous observations, is the use of Excel as a tool to manage report cards and academic processes that have not been computerized and are not well integrated. managing report cards and academic processes that have not been computerized and are not well integrated. This causes potential errors in processing grade data and requires more time and effort to record and calculate student grades. In addition, the limited and non-computerized grade reporting process also resulted in a lack of transparent access for parents to student grades and performance information, making it difficult to assess and make necessary improvements to support student development.

3.3.2 Proposed Model. At this stage are the stages proposed in solving the problems being faced based on the analysis that has been done. The proposed stages can be seen in the Figure 2.

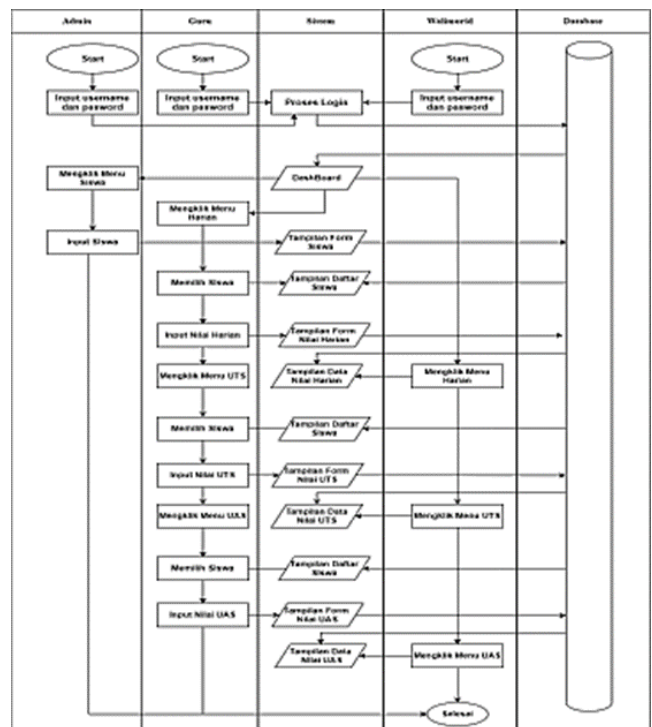


Fig. 2 Proposed Model

3.3.3 Final Condition. At the final condition stage, researchers evaluate the results of the proposed model that has been applied. The goal is to determine the effectiveness of the proposed model in solving existing problems. Researchers also evaluate the impact of the application of the proposed model on the object or research environment. This stage is carried out by collecting data.

4 Result and Discussion

The web-based and mobile Academic Information System (AIS) was created using CodeIgniter 4 (CI4) for web development and

Dart/Flutter for Android (mobile) application development. The implementation will explain the script and mobile web interface.

4.1 Implementation of Mobile Results.

4.1.1 *User Login Page.* This page contains two forms for login, namely username and password after the user fills out the form, he can proceed to enter the dashboard, by clicking the login button.

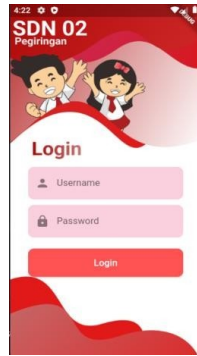


Fig. 3 User Login Page

4.1.2 *Main Page.* This page contains a welcome from the system and also announcements shared by the school as well as several main menu menus related to grades.



Fig. 4 Main Page

4.1.3 *Daily Assessment Page.* This page contains daily assessment data which is equipped with daily assessment data attributes such as subject names and themes.



Fig. 5 Daily Assessment Page

4.1.4 *Midterm Assessment Page.* This page contains data on midterm grade data which is equipped with data attributes from midterm grades such as subject names.

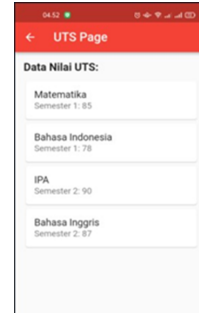


Fig. 6 Midterm Assessment Page

4.1.5 *End of Semester Assessment Page.* This page contains data on the end of semester grade data which is equipped with data attributes from the final grade such as the name of the subject and the grade itself.

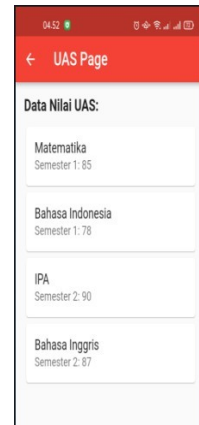


Fig. 7 End of Semester Assessment Page

4.1.6 *Profile Page.* This page contains student's profile such as NISN, NIK, student profile picture, and more.



Fig. 8 Profile Page

5 Conclusions

Based on the description of the previously discussed discussion regarding the design of web-based and mobile academic information systems, it can be concluded that:

- (1) The stages in designing and creating this mobile web-based academic information system start from functional and non-functional needs system analysis, followed by system design using the UML method and there are also table relations and interface design.system design that uses the UML method and there are also table relations and interface design.

- (2) Academic information system through a series of black box tests. The test results show that the system functions properly and as expected.
- (3) The academic information system can be used at SDN 02 Pegirangan, this makes it easier to find data on grades, students, and teachers and helps make grade reports

The academic information system can be used at SDN 02 Pegirangan, this makes it easier to find data on grades, students, and teachers and helps make grade reports:

- (1) It is hoped that the development of the next version can expand the academic information system by adding special mobile application features for teachers. This application will allow teachers to input grade data easily through their mobile devices. And a web for student guardians that allows student guardians to access through other device browsers besides Android.
- (2) Extend the grade report by adding graphs or data visualizations to provide a clearer view of students' academic progress.
- (3) Update the interface design to be more modern and user-friendly, to provide a better experience to users.

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