



Android-Based School Exam Information System for Sixth Grade Students at SD Negeri 23 Prabumulih

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Abstract

The school examination information system is a digital platform that aids in the administration of examinations for 6th-grade elementary school students. This research aims to develop an efficient and effective school examination information system to enhance the examination administration process at the elementary school level. The system development method waterfall and utilizes an object-oriented software design approach, considering the specific needs of elementary school examination administration. The developed system encompasses various features, such as examination scheduling, student data management, examination result recording, and provision of evaluation reports. The implementation of this system is expected to provide convenience for schools in managing and conducting school examinations, thereby facilitating smoother and more efficient learning processes.

Keywords: School Exams, Waterfall Method, Information Systems

1. Introduction

In today's digital era, information technology plays a crucial role in various aspects of life, including in the field of education. One aspect that requires special attention is the implementation of school exams, which are an integral part of the process of evaluating and assessing student learning outcomes. School exams not only serve to measure student competency achievement but also act as indicators of the success of the learning process at school. The tradition of school exams, which are generally conducted conventionally using paper and pencil, often faces various challenges, such as administrative issues, grading, and distribution of exam results. This manual process can lead to delays in processing exam results and often results in inaccuracies in recording and reporting. Additionally, there are also challenges related to accessibility and the comfort of students during the exam.

To address these various challenges, a system is needed that can simplify and expedite the school exam process. One of the solutions that can be implemented is the development of an Android-based School Exam Information System. This system is specifically designed for sixth-grade students, which is the final stage of elementary education before moving on to the next level of education. By leveraging Android technology, this system is expected to provide ease in conducting exams, processing results, and distributing information to students, teachers, and parents. According to the Father of Indonesian Education, who is known for his distinctive motto "Ing Ngarsa Sung Tuladha, Ing Madya Mangun Karsa, Tut Wuri Handayani." Ki Hajar Dewantara defines education as an effort to advance the growth of character education (inner strength and character), intellect, and physical health of children. Education is increasingly shifting towards the use of technology in the learning process.

The implementation of the current try out is carried out by educational organizers by providing additional class hours after school to deliver extra material that will be tested. In addition, there is also a simulation of the Computer-Based National Examination (UNBK) which is conducted two to three times leading up to the national exam. The try out simulation is held in each school according to a predetermined schedule.[1]

In view of this trend, we intend to build a system that can assist schools in conducting CBT exams that can be used for daily tests. This way, students will become accustomed to the CBT examination process when they face the National Final Examination (UAN) and the Semester Final Examination (UAS) in the future. Additionally, implementing CBT exams will make it easier for teachers in the process of grading exam results. In the initial stage of the research, the design of the intended system focuses on designing the exam application interface, which is expected to assist and not complicate students in taking computer-based tests.[2]

2. Theoretical Foundations

2.1 System

A system can be defined as a collection or set of elements, components, or variables that are organized, interact with each other, are dependent on one another, and are integrated.[3]

2.2 Information

In general, information can be defined as the result of data processing in a form that is more useful and meaningful to the recipient, which describes a real event used for decision making.[3]

2.3 Online Exam

Online exams can be interpreted as a method used by someone to determine the ability of an individual/exam participant through the virtual world by utilizing facilities that can connect the exam participants to the virtual world, such as laptops/computers/smartphones, modems, wifi, etc., and by using specific rules to prevent exam participants from cheating like in written exams, and conducted within a certain time frame.[4]

2.4 Android

Android is an operating system for mobile phones based on Linux. Android provides an open platform for developers to create their own applications for use on various mobile devices. Initially, Google Inc acquired Android Inc, a startup that developed software for phones.[5]

2.5 System Development Method

Software development methodology or system development methodology is a framework used to structure, plan, and control the process of developing an information system. System development methods are activities to obtain facts or principles (whether activities for discovery, testing, or development) of a body of knowledge by systematically collecting, recording, and analyzing data.

The waterfall SDLC model is often referred to as the sequential linear model or the classic life cycle. The waterfall model provides a sequential approach to the software life cycle, starting from analysis, design, coding, testing, and support stages.[6]

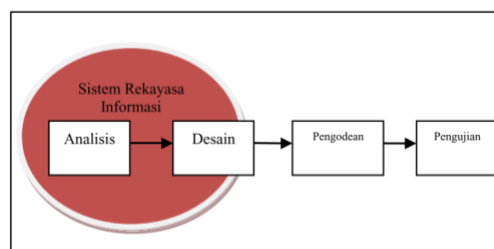


Figure 1: Waterfall Method

3. Research Methodology

This method is used to discuss and elaborate on the data obtained, then to conclude the issues in order to get accurate answers. In the preparation of this thesis report, the method used is the descriptive method, which explains the data that has been obtained so as to provide an overview.

3.1. Tools for System Analysis and Design

In the design stage of this system, a section will be designed that shows the procedures of the system to be created. The tool that will be used to design the system is UML (Unified Modeling Language). According to Rosa and Shalahuddin (2019:124), "UML (Unified Modeling Language) is one of the standard languages widely used in the industrial world to define requirements, make analysis and design, and depict architecture in object-oriented programming."

3.2. UML (Unified Modeling Language)

UML is a standard modeling language that has syntax and semantics for documenting and also specifying and building software systems.[7]

3.2.1. Use Case Diagram

The use case diagram illustrates the expected functionality of a system. A use case represents an interaction between an actor and the system. The main components of this use case diagram are the actors and the use cases.[8]

The online examination system (Computer-Based Test) is proposed as a solution to address the problems of elementary school exams at SD Negeri 23 Prabumulih by offering better efficiency and effectiveness through the implementation of Android-based information technology. This stage represents the initial phase of the waterfall method used with a Requirements Analysis, in which we identify what is needed for the development of the online examination system. This system enables fast and efficient data storage, reduces errors in the

assessment process, and enhances the security of exam data. The design of the School Examination Information System for sixth-grade students based on Android at SD Negeri 23 Prabumulih can be seen in the Use Case Diagram in the following image.

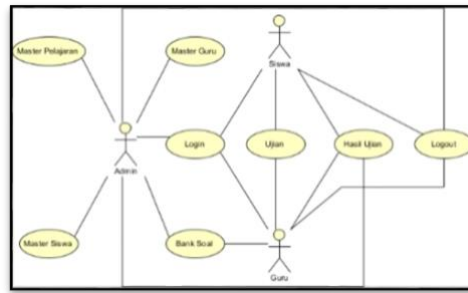


Figure 2: Use Case Diagram

3.2.2. Activity Diagram

Activity Diagram is another important behavioral diagram in UML that functions to illustrate the dynamic aspects of a system. The activity diagram is essentially an advanced version of a flowchart that models the flow from one activity to another. The School Examination Information System for Sixth Grade Students Based on Android at SD Negeri 23 Prabumulih consists of 8 (Eight) activity diagram designs.

3.2.2.1. Activity Diagram Login

School Exam Information System for Sixth Grade Students Based on Android at SD N 23 Prabumulih, which explains the stages carried out by users before entering the School Exam Information System for Sixth Grade Students Based on Android at SD N 23 Prabumulih.

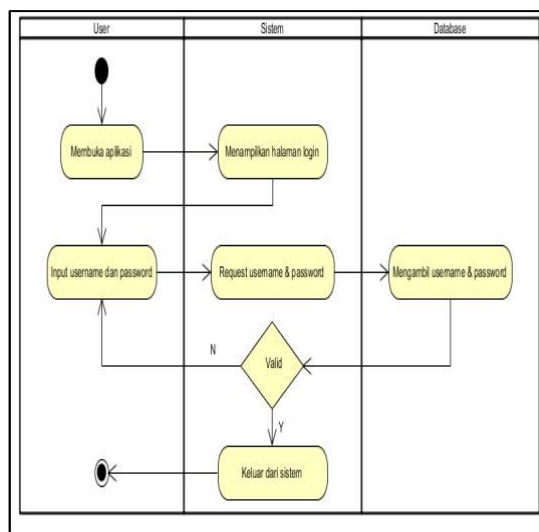


Figure 3: Login Activity Diagram

3.2.2.2. Activity Diagram Master Teacher

Activity Diagram for the Master Teacher explaining the process of users accessing the master data of State Elementary School 23 Prabumulih.

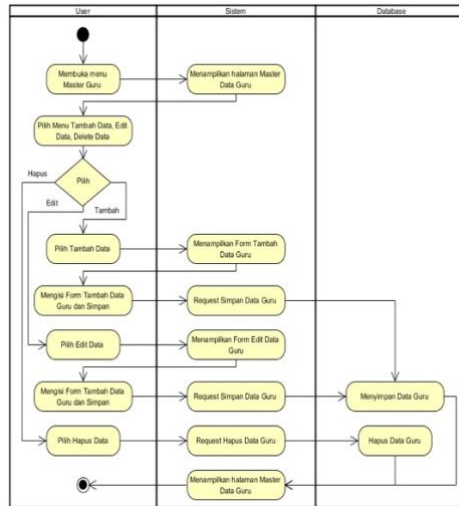


Figure 4: Activity Diagram Master Teacher

3.2.2.3. Student Master Activity Diagram

Activity Diagram Master Siswa yang menjelaskan proses pengguna mengakses data master siswa SD Negeri 23 Prabumulih.

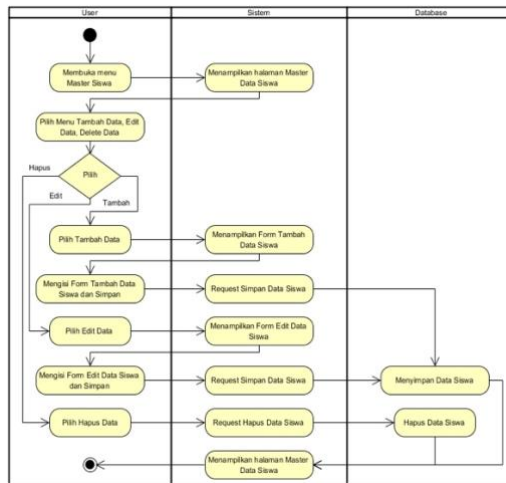


Figure 5: Student Master Activity Diagram

3.2.2.4. Activity Diagram of Subject Master

Activity Diagram of the Subject Master that explains the process of users accessing the subject master data of State Elementary School 23 Prabumulih.

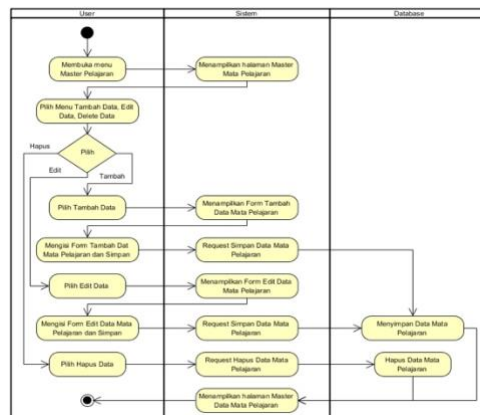


Figure 6: Activity Diagram of the Subject Master

3.2.2.5. Activity Diagram of Question Bank

This Activity Diagram explains the process of users accessing the question bank of the School Examination Information System for sixth-grade students based on Android at SD Negeri 23 Prabumulih, which can be seen in Figure 4.6 below:

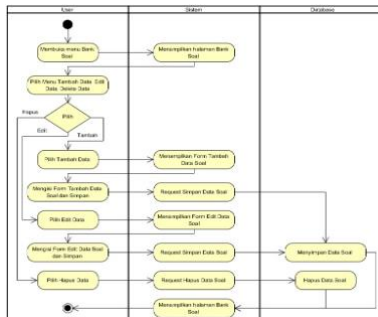


Figure 7: Activity Diagram Question Bank

3.2.2.6. Exam Activity Diagram

This Activity Diagram explains the process of users accessing the school exam on the School Exam Information System for Grade VI Students based on Android at State Elementary School 23 Prabumulih, which can be seen in Figure 4.7 below:

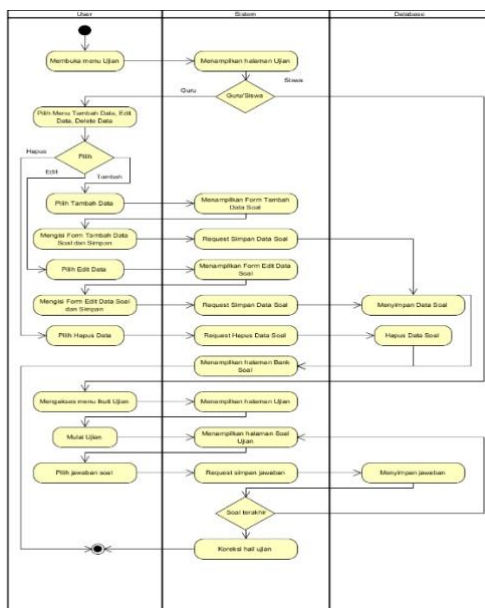


Figure 8: Exam Activity Diagram

3.2.2.7. Activity Diagram of Exam Results

This Activity Diagram explains the process of users accessing the school exam results on the School Exam Information System for Grade VI Students Based on Android at State Elementary School 23 Prabumulih, which can be viewed on.

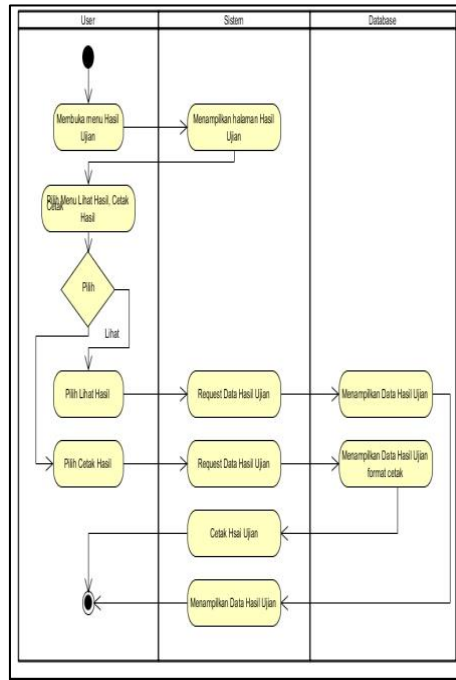


Figure 9: Activity Diagram of Exam Results

3.2.2.9 Activity Diagram Logout

The Logout Activity Diagram explains how users exit the School Exam Information System for 6th Grade Students based on Android at State Elementary School 23 Prabumulih, which can be seen in.

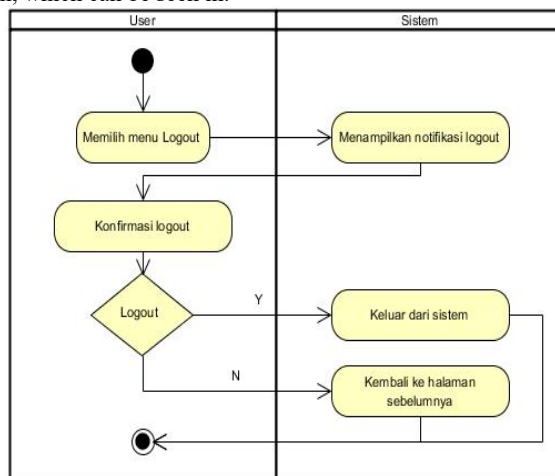


Figure 10: Activity Diagram of Exam Results

4. Implementation

The research discusses how to develop a school examination information system, the examination mechanisms, and the conventional or manual examination schedules. How to create that school examination system.

4.1. Login Page

When the school exam information system application is accessed for the first time, it will display a login interface like

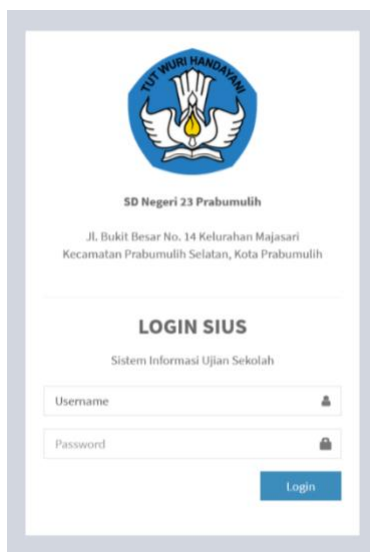


Figure 11: Login page

4.2. Dashboard Page

The admin user dashboard interface provides information such as the number of study groups, number of classes, number of teachers, and number of sixth-grade students, while the teacher user dashboard interface displays information about teachers accessing the school examination information system application, and information on the rules for online examinations.

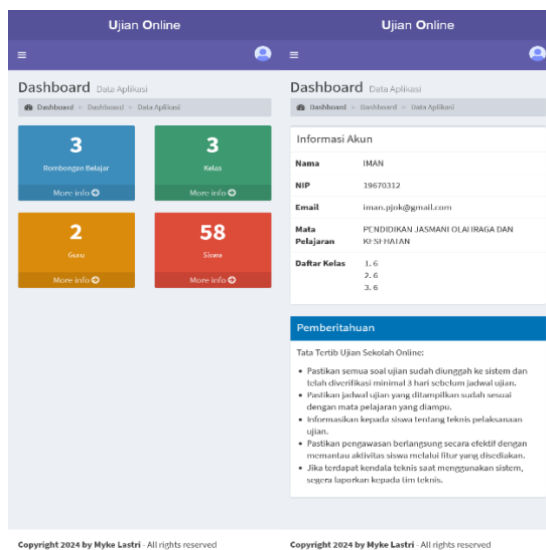
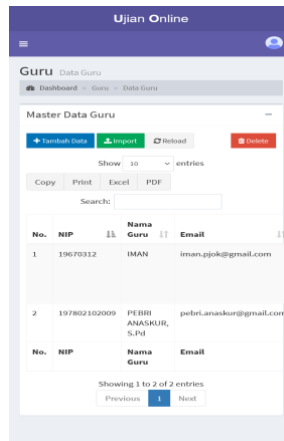


Figure 12: Dashboard page

4.3. Teacher Master Interface

The Teacher Master Interface is a feature for admin users to view the list of teachers at the State Elementary School 23 Prabumulih, add teacher data, edit or delete teacher data.

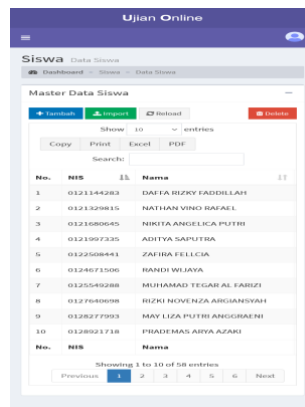


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Figure 13: Teacher Master Interface

4.4. Student Master Interface

The Student Master Interface is a feature for the admin user to view the list of students from Public Elementary School 23 Prabumulih, add student data, edit, or delete student data.



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Figure 14: Student Master Interface

4.5. Master Subject Interface

The Master Subject interface is a feature for admin users to view the list of subjects at SD Negeri 23 Prabumulih, add subject data, edit, or delete subject data.

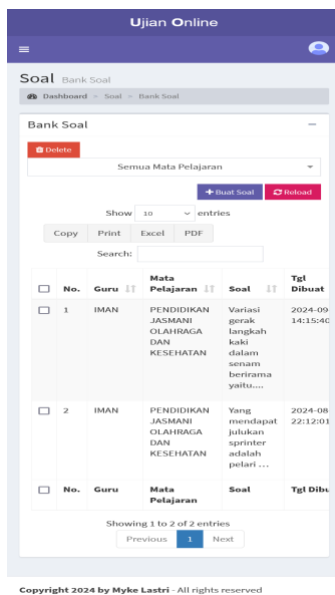


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Figure 15: Master Subject Interface

4.6. Bank Question Interface

The Question Bank Interface is a feature for admin users to view the question bank data of the SD Negeri 23 Prabumulih school examination information system, create or add data to the question bank, as well as delete question data from the question bank.



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Figure 16: Bank Question Interface

4.7. Question Creation Interface

The Create Question interface is a feature for admin users to create questions or add new questions to the question bank of the SD Negeri 23 Prabumulih school exam information system. In this interface, the admin user can input question prompts that may include images, determine the answer key, and set the weight of the score for the added questions.

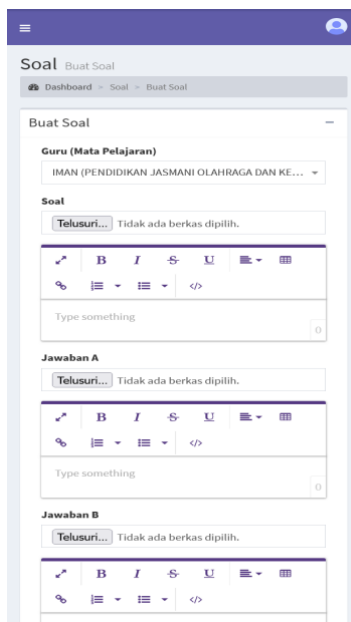
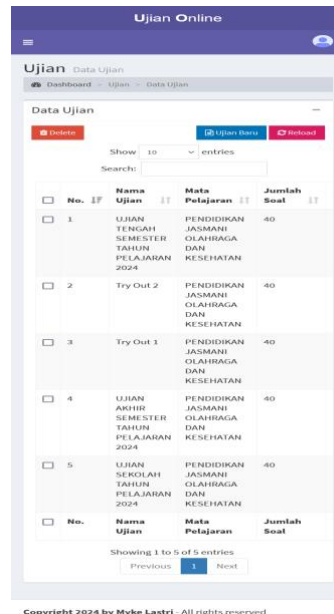


Figure 17: Question Creation Interface

4.8. Exam Data Interface

The Exam Data Interface is a feature for admin users to view the list of exams for SD Negeri 23 Prabumulih, add to the list of school exams, edit or delete the list of school exams.

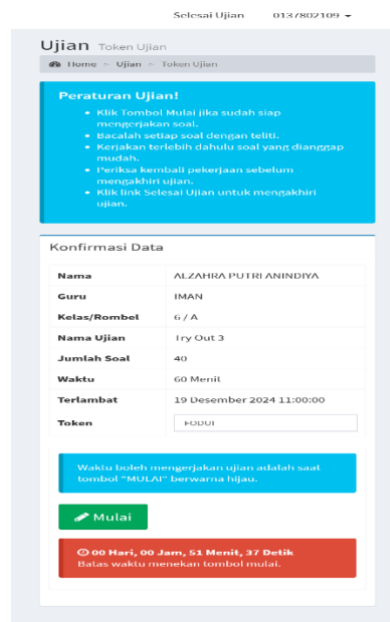


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Figure 18: Exam Data Interface

4.9. Exam Token Interface

This Exam Token Interface is a feature for school student users to take exams. Before entering the exam questions page, students must first enter the exam token and click the 'Start' exam button.



Kamis, 19 Desember 2024, 10:08:22

Figure 19: Exam Token Interface

4.10. Exam Results Interface

The Exam Results Interface is a feature for admins, teachers, and students to view exam results in the school exam information system of SD Negeri 23 Prabumulih.

No. Ujian	Nama Ujian	Mata Pelajaran	Guru	Jumlah Soal
1	Try Out 1	PENDIDIKAN JASMANI OLAHRAGA DAN KESEHATAN	IMAN	40
2	Try Out 2	PENDIDIKAN JASMANI OLAHRAGA DAN KESEHATAN	IMAN	40
3	Try Out 3	PENDIDIKAN JASMANI OLAHRAGA DAN KESEHATAN	IMAN	40
4	UJIAN AKHIR SEMESTER TAHUN PELAJARAN	PENDIDIKAN JASMANI OLAHRAGA DAN KESEHATAN	IMAN	40

Figure 20: Exam Results Interface

5. Conclusion

Based on the results of the research and implementation that has been carried out, the Android-Based Class VI School Exam Information System at SD Negeri 23 Prabumulih has been successfully developed using the waterfall method as an approach to system development. This application is designed to improve the efficiency and effectiveness of the exam implementation, from the design stage to implementation.

Acknowledgement

For further development, here are suggestions that can serve as a reference:

1. Add a feature to support offline testing, with automatic data synchronization when an internet connection is available.
2. Add an analytics feature to help teachers evaluate student performance in-depth, such as exam result statistics and learning recommendations.
3. Provide special training for teachers and administrators to maximize the use of all application features.

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