Journal Of Engineering And Technology Innovation (JETI)
December 2023 | Vol. 2 | No. 3

PERANCANGAN SISTEM INFORMASI PENILAIAN SISWA PADA BIMBEL SECN BERBASIS WEB

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Abstract

The advancement of information technology has significantly impacted various fields, including education. The Smart Education Centre Nusantara (SECN) tutoring center in Batam still employs a manual system for student assessment, causing delays and inefficiencies in recording and monitoring learning outcomes. Therefore, this study aims to design and develop a web-based Student Assessment Information System to enhance the efficiency of academic data management at SECN. The system is developed using the Waterfall model, which includes analysis, design, implementation, testing, and maintenance phases. The system design utilizes Unified Modeling Language (UML) with use case, activity, sequence, and class diagrams. The development employs web-based technologies, including XAMPP as a local server, MySQL as the database, and PHP with Visual Studio Code as the programming tools. The results of this study produce an assessment information system that enables tutoring center administrators, teachers, and parents to monitor students' academic progress in real-time. System testing was conducted using the Black Box Testing method to ensure all functionalities operate as designed. This system is expected to make academic management at SECN more structured, efficient, and accurate in compiling student progress reports.

Keywords*: Information System, SECN Tutoring Center, Web, Waterfall, UML*

INTRODUCTION

The rapid development of technology and information, both in terms of software and hardware, has significantly influenced various fields, especially in the advancement of web applications. Since the emergence of internet technology, the ease and speed of transmitting, delivering, and receiving information have greatly benefited companies, schools, universities, and other institutions. This technological advancement enables systems to function effectively and efficiently, where computers, as integrated devices, work together within a system to execute programs. [1]

Smart Education Centre Nusantara (SECN), a tutoring center located on Bengkong Abadi Street, was established in 2018 and has continued to grow as one of the leading educational institutions in Batam, particularly in the Bengkong Abadi area. SECN serves a diverse community, providing educational support for children and teenagers.

Based on observations conducted by the owner of Smart Education Centre, the current manual system used for assessment has proven to be inefficient and often leads to challenges, such as difficulties in evaluating student performance. This inefficiency impacts the quality of services provided, particularly in terms of time efficiency and data accuracy.

The implementation of an information system is expected to assist tutoring center administrators, teachers, and parents by providing real-time access to attendance records and student progress. Additionally, it will simplify the scheduling process to better meet students' learning needs. This system is anticipated to enhance data management efficiency and service quality, creating a more structured and optimal learning environment while also easing the workload of teachers and administrators. Ultimately, this research aims to provide a practical solution for improving data reporting processes at SECN.

Assessment

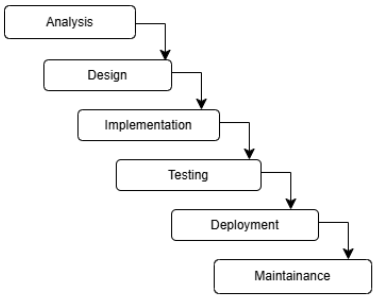
Learning is an interactive process between students and educators (teachers) that helps students learn more effectively. Through learning, students gain knowledge, develop attitudes, and build self-confidence. Learning is a process in which teachers assist students in expanding their knowledge, which can later be applied in the future. Teachers must keep up with developments in Science and Technology (IPTEK) in education to avoid falling behind in the rapidly advancing technological era. [2]

Assessment in the learning process is crucial, making data processing of student grades one of the key pillars in education. Proper management of assessment data will result in accurate report cards as an essential part of the evaluation process. Additionally, the processed data serves as a benchmark for measuring students' academic success. The implementation of an information system can facilitate the smooth operation of educational institutions, particularly in the learning process between educators and students, to achieve the desired educational goals. [3]

In principle, setting objectives is fundamental in teaching, and every teaching process should be directed toward achieving the established goals. Therefore, the teaching process must be well-planned. The extent to which these objectives are met can be monitored and evaluated. Learning is a structured combination of human elements, materials, facilities, equipment, and procedures that interact with one another to achieve learning objectives. [4]

METODE PENELITIAN

Waterfall Method



Gambar 1: Metode SDLC

The Waterfall Method is one of the most commonly used SDLC models in the development of information systems and software. This model follows a systematic and sequential approach, progressing from the planning stage to the maintenance stage in a step-by-step manner. Developers need to understand how the system development process works when using the Waterfall model, as well as its key characteristics. [5] The System Development Life Cycle (SDLC) model follows the Waterfall model, also known as the Sequential Linear model or Classic Life Cycle. The Waterfall model provides a sequential approach to the software development lifecycle, starting from analysis, design, coding, testing, and support stages. [6]

This study utilizes the Waterfall method in developing a web-based student assessment system. The System Development Life Cycle (SDLC) model, commonly referred to as the Waterfall model, follows a sequential linear or classic life cycle approach. It ensures a structured software development process, progressing through analysis, design, coding, testing, and support stages. [7] Waterfall Model Phases, Requirement Analysis – An intensive process of gathering requirements to specify the software needs and understand what kind of system users require. This often involves analyzing existing systems within a company to collect the necessary information. Design – A multi-step process focusing on software program design, database structure, and user interface representation. Implementation – The stage where the entire design is transformed into program code. The generated program code is initially in the form of modules that will later be integrated into a complete system. Testing – This phase involves integrating the

created modules and conducting testing to verify whether the software aligns with the design and functions correctly, as well as detecting any errors. Deployment – After software deployment to users, modifications may still be required due to undetected errors during testing or the need for adaptation to the operating environment. Maintenance – This phase involves installation and system improvements as agreed upon. Testing is conducted to assess the software's logic and functionality, ensuring that all components have been thoroughly tested. This helps minimize errors and ensures the expected output is achieved.

Data Processing Method in This Research For this research on the student assessment information system at Bimbel SECN, the data processing method consists of the following stages: Planning – The researcher begins by conducting observations at the research location. Analysis – Identifying and analyzing any issues in the research environment, aiming to improve the system based on the findings. Design – Designing and determining how to process information system data based on the analysis results. This includes user interface design, data structuring, and defining system activities. Implementation – The stage in the system development cycle that involves applying and operating the designed and tested system.

HASIL DAN PEMBAHASAN

Requirement Analysis

Requirement analysis is the stage of breaking down all necessary elements to describe the system requirements in detail. The objective is to create something new or improve the design of the Web-Based Student Assessment Information System at Bimbel SECN.

Data Processing

In the data processing stage, researchers analyze the student assessment information system to identify existing issues. This involves examining both primary and secondary data to develop a system design that aligns with user needs.

System Analysis

System analysis is the process of breaking down a complete information system into its individual components. This is done to identify and evaluate issues, opportunities, challenges, and expected requirements to propose necessary improvements.

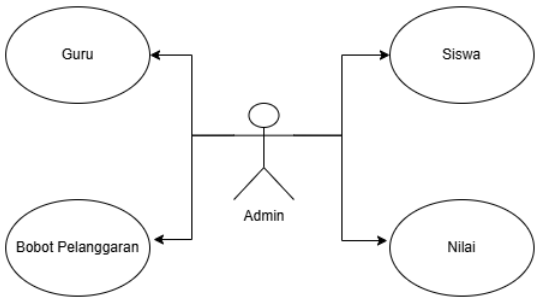
Functional Requirements – These include processes or services that enable user interactions and system activities. Non-Functional Requirements – These focus on system properties and supporting components, including hardware, human resources (brainware), and software.

Software Requirements The system's software specifications include: Windows 11 – Used as the operating system for designing the information system. XAMPP – Plays a crucial role in system development, providing an environment for web server, PHP, and database management. MySQL – An open-source relational database management system (RDBMS) that supports multithreading, multi-user access, and structured query language (SQL) database management. Code Editor – A Microsoft-developed application compatible with all desktop platforms, essential for system coding and development.

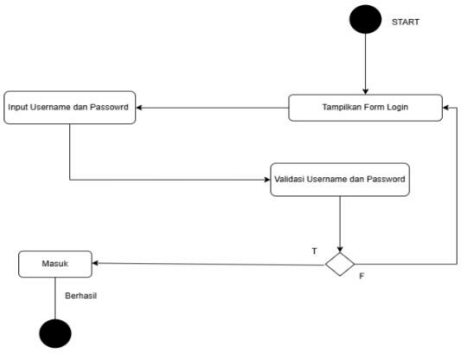
Hardware Requirements. The following hardware components support the system: Laptop – A portable personal computer with an integrated battery, allowing mobility. Unlike desktop computers, laptops do not require external components such as a separate CPU. The laptop components include a processor, motherboard, memory (RAM), hard drive, graphics card, and input/output interfaces, all of which contribute to system functionality.

System Design

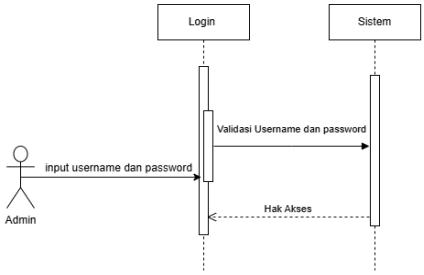
System design is the process of structuring system elements, including architecture, modules, components, and their respective interfaces, as well as the data flow within the system. Below is the design of the Student Assessment Information System at Bimbel SECN.



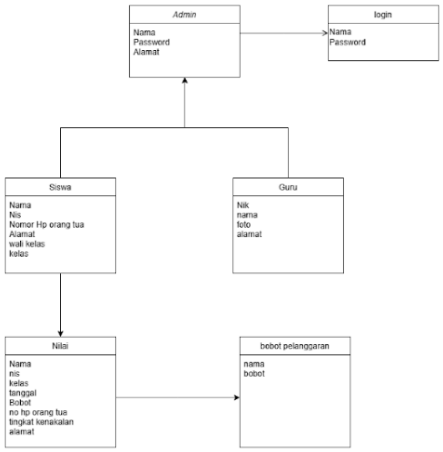
Gambar 2: Use Case Diagram Admin



Gambar 3: Activity Diagram Login



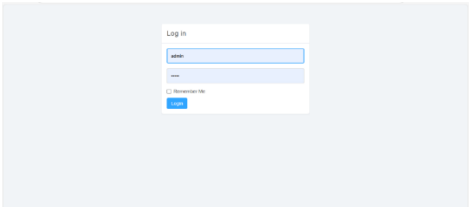
Gambar 4: Sequence Diagram Login



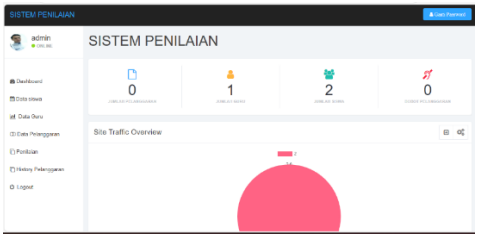
Gambar 5: Class Diagram Database

Program Implementation

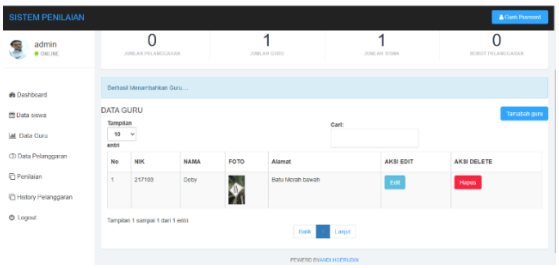
Implementation is the process of applying the program design created in the previous chapter or executing the developed information system application. The result of this implementation stage is a data processing system that operates effectively. Through this stage, it can be determined whether the software successfully produces an information system application that meets the intended objectives. The system implementation is carried out using PHP programming language, with MySQL as the database management system.



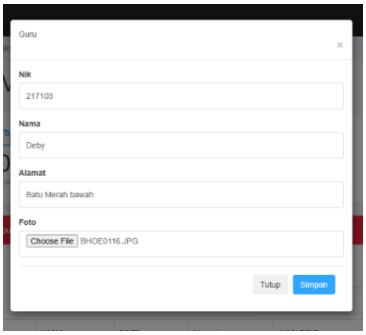
Gambar 6: Halaman Login



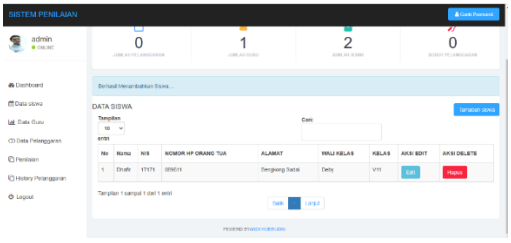
Gambar 7: Dashboard



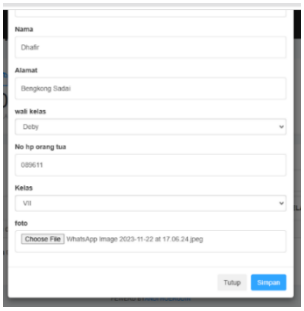
Gambar 8: Halaman Data Guru



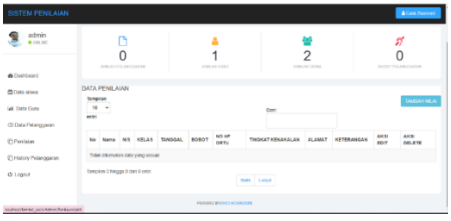
Gambar 9: Tambah Data Guru



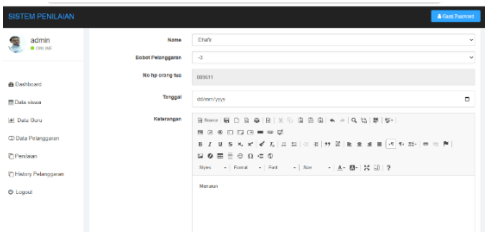
Gambar 10: Halaman Data Siswa



Gambar 11: Tambah Data Siswa



Gambar 12: Halaman Data Nilai



Gambar 13: Tambah Data Nilai

CONCLUSION

The design of the Student Assessment Information System at Bimbel SECN is an appropriate solution for SECN students. Based on the research process and results, the following conclusions can be drawn: The proposed system is an online-accessible system that is connected to multiple devices. The development stages include software analysis, system design, coding, and testing. The system testing phase utilizes the black-box method to ensure that all components are properly tested, minimize errors, and guarantee that the output aligns with expectations. With this system, teachers can efficiently conduct learning activities and monitor student attendance. Additionally, delays in information flow can be prevented, as data processing, searching, and report generation are fully computerized. This ensures higher-quality and more reliable information.

SUGGESTIONS

Based on the findings of this research, there are weaknesses in the system that has been designed. Therefore, several suggestions can be made to improve the system's effectiveness and efficiency: To ensure the system works effectively and efficiently, skilled personnel are required to operate the application. To develop skilled users, training sessions should be held to educate them on how to use the system. In implementing a computerized system, it is essential to support it with adequate resources, both in terms of human resources (brainware) and hardware and software.

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