

DESIGN MOCKUP OF THE TEACHER ATTENDANCE MONITORING INFORMATION SYSTEM AT SMK IBNU SINA BATAM

Nofri Yudi Arifin*¹

¹Program Studi Teknik Informatika, Fakultas Teknik –Universitas Ibnu Sina, Batam
e-mail: *nofri.yudi@uis.ac.id,

Abstract

Teacher attendance is a crucial aspect in maintaining the quality of education in schools. SMK Ibnu Sina Batam currently employs a manual method for recording teacher attendance, which is prone to errors, delays in data compilation, and a lack of transparency in reporting. This study aims to develop a web-based information system mock-up to monitor teacher attendance more efficiently, accurately, and transparently.

The research adopts the prototype model, which allows system development by involving users in each stage. The designed mock-up includes key features such as user login, attendance recording, teacher data management, and attendance report generation. The analysis results indicate that a web-based system offers advantages over the manual method in terms of recording speed, data security, and information accessibility.

The findings suggest that a web-based teacher attendance monitoring system can serve as an effective solution to enhance school administration efficiency. Further implementation is recommended by incorporating biometric features and a mobile version to improve system functionality.

Keywords— Information System, Teacher Attendance, Prototype, SMK Ibnu Sina Batam, Web-Based System.

INTRODUCTION

The presence of teachers is a crucial factor in ensuring the quality of the teaching and learning process in educational institutions. However, many schools still use manual methods to record teacher attendance, such as filling out attendance books manually. This method is prone to data manipulation, document loss, and requires a long time for data processing (Hasbi & Ismail, 2020). With the advancement of information technology, various solutions have been proposed to improve efficiency and accuracy in monitoring teacher attendance. One such solution is the development of a web-based attendance monitoring system that allows real-time monitoring and minimizes human errors (Febiharsa, Suryani, & Hidayat, 2018).

The implementation of technologies such as Radio Frequency Identification (RFID) and the Internet of Things (IoT) has also been applied in attendance recording to enhance accuracy and efficiency (Dinasari, Sari, & Wibowo, 2020). Other studies indicate that biometric-based attendance systems offer advantages in terms of security and data accuracy compared to manual methods (Rahmadani, Prabowo, & Hidayat, 2021). Additionally, the use of responsive web-based applications integrated with social media platforms like Telegram has been implemented to provide real-time attendance information (Sutrisno & Putra, 2019).

At SMK Ibnu Sina Batam, teacher attendance recording is still conducted manually, which may lead to issues such as delays in reporting and a lack of data accuracy. Therefore, an information system is needed to effectively and efficiently monitor teacher attendance. The use of a web-based system with automation features can help reduce human error and improve data transparency (Prasetyo, 2020).

This study aims to design a mockup of an information system for monitoring teacher attendance at SMK Ibnu Sina Batam. With this system, it is expected that attendance monitoring can be carried out more efficiently, accurately, and in real-time, thereby supporting the improvement of educational quality at the school. Previous studies have shown that implementing information systems in attendance monitoring can enhance efficiency and data accuracy. For example, a web-based system with automatic notification features can improve teacher discipline (Wijaya & Rahayu, 2019).

By designing a mockup of a teacher attendance monitoring system tailored to the needs of SMK Ibnu Sina Batam, it is hoped that this solution can effectively address existing issues and support the improvement of the teaching and learning process at the school.

RESEARCH METHODS

The research method used in this study is the descriptive method, which aims to systematically collect data and describe and interpret the research object based on actual conditions. This method is often referred to as a non-experimental method because it does not involve the manipulation or control of research variables (Sugiyono, 2017).

This study is also supported by a software development method using the prototype model. This model is used to identify user needs in more detail, especially when initial information from users is still limited. This approach allows developers to create an initial prototype, which is then refined based on user feedback (Pressman, 2014). Although effective in uncovering requirement specifications, this model also carries risks related to increased development costs and time (Sommerville, 2011).

This research applies relevant data collection methods to support analysis and findings (Creswell, 2014).

Software Development Method

This study utilizes the prototype model as a software development method. This model aims to bridge the gap in understanding between users and developers in technical aspects and helps clarify the desired system requirements.

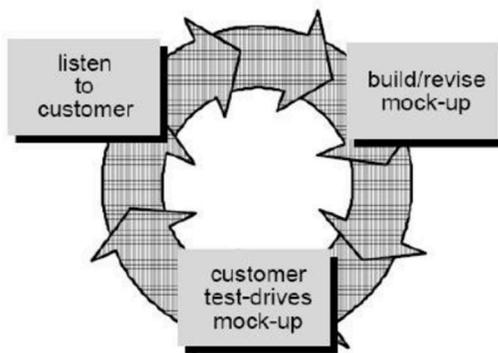


Figure 1. Illustration of Prototype Model

Stages in the Prototype Model

The stages in the prototype model can be explained as follows:

1. Requirement Identification

This process begins with gathering information related to system requirements from SMA Negeri 1 Sekayam. A needs analysis is conducted through interviews and observations to understand how the BOS fund management system operates and to collect the necessary data.

2. Mock-up Creation and Refinement

Once the requirements are identified, the developer creates a mock-up as an initial representation of the system to be developed. This mock-up serves as an initial interface with a simulated software workflow, providing a clearer visualization of the desired system. System modeling is done using Unified Modeling Language (UML), including diagrams such as activity diagrams, use case diagrams, entity relationship diagrams (ERD), logical record structures (LRS), class diagrams, and sequence diagrams. For interface design, technologies such as PHP, HTML, CSS, and Bootstrap are used.

3. Mock-up Evaluation and Testing

This stage involves evaluating and testing the mock-up to ensure that the system specifications align with the needs of SMA Negeri 1 Sekayam. The tested mock-up serves as an early representation of the software, allowing users to assess the system's design and functionality before final implementation. If the mock-up meets user expectations, the system development proceeds to the next stage.

RESULT AND DISCUSSION

Based on the applied method, the development of the teacher attendance monitoring system mock-up at SMK Ibnu Sina Batam is carried out through several stages, including requirement identification, mock-up creation, and evaluation and testing.

System Requirement Identification

At this stage, system requirements are gathered through interviews with school representatives and observations of the current manual attendance system. Several key issues identified include:

1. Inefficiency in manually recording teacher attendance.
2. Potential data manipulation and document loss.
3. Lack of transparency and delays in attendance reporting.

System Mock-up Development

Based on the requirement identification results, an initial system mock-up was created, featuring:

1. Login Page
Utilizes authentication based on a username and password.
2. Admin and Teacher Dashboard
3. Admin has access to manage attendance data and Teachers can only view their personal attendance records.
4. Attendance Form
Teachers can record their attendance through a web-based interface.

Mock-up Design

The mock-up design is a visual representation of the application's user interface before the full development stage. It serves as an initial illustration of the layout, navigation, and interactions that will be implemented in the system.

For the Teacher Attendance Monitoring Application at SMK Ibnu Sina Batam, the mock-up is designed to ensure ease of use and efficiency in accessing attendance information. Each interface element is crafted to be intuitive, from the main page and navigation menu to the teacher attendance report display. With this mock-up, developers and stakeholders can evaluate and make necessary adjustments before the system is fully implemented.

1. Admin Login Page

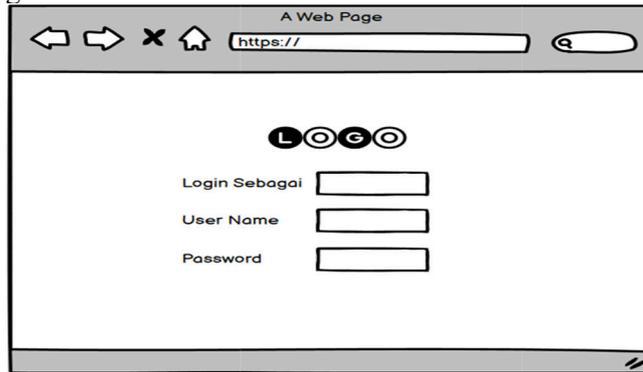


Figure 1. Admin Login

2. Dashboard Home

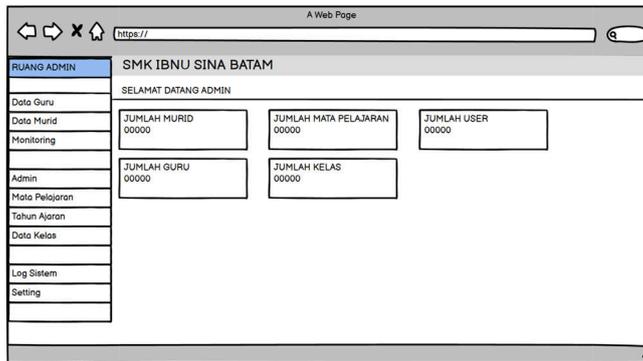


Figure 2. Admin Dashboard Page

3. Teacher Data Edit Page

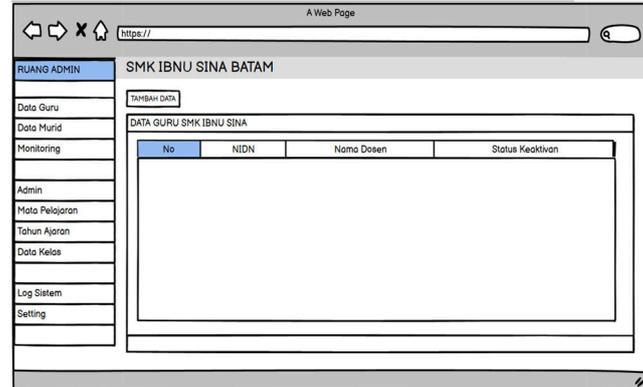


Figure 3. Teacher Data Edit Page

4. Student Data Edit Page

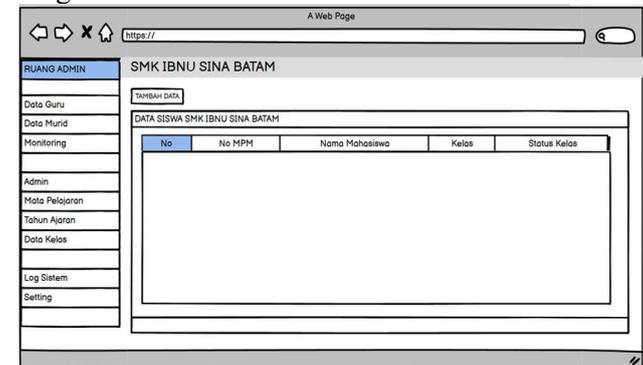


Figure 4. Student Data Edit Page

5. Edit Add Course Page

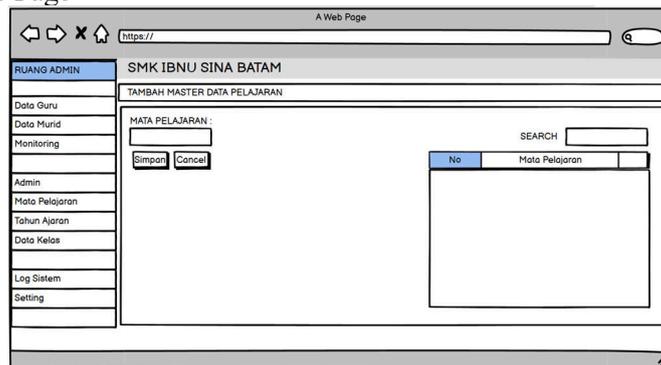


Figure 5. Add Course Page

6. Academic Year Data Add Page

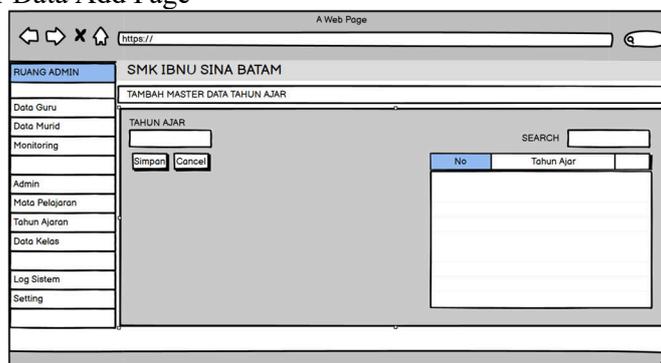


Figure 6. Academic Year Data Page

7. Add Class Data Page

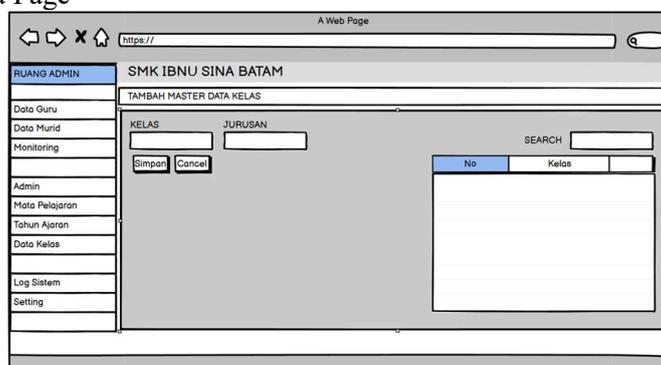


Figure 7. Class Data Page

1. Teacher Login Page

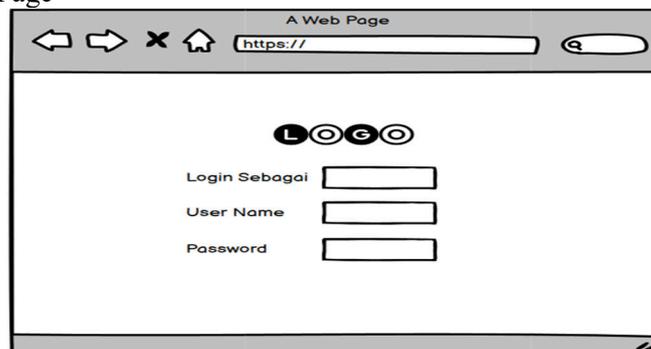


Figure 8. Teacher Login Page

2. Teacher Dashboard Page

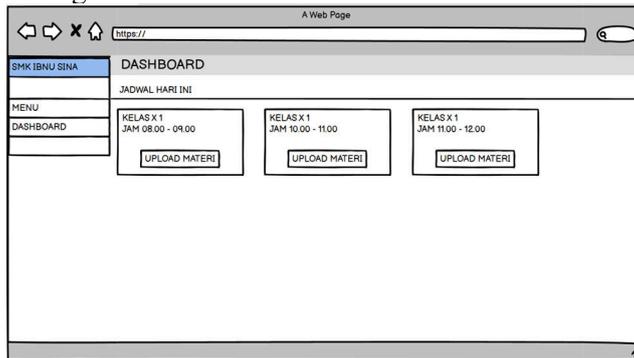


Figure 9. Teacher Dashboard Page

1. Student Login Page

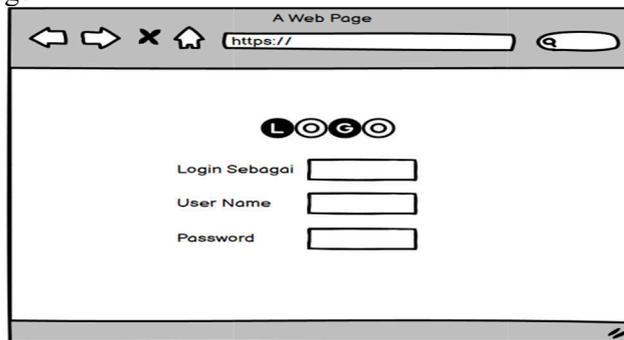


Figure 10. Student Login Page

2. Student Dashboard Page

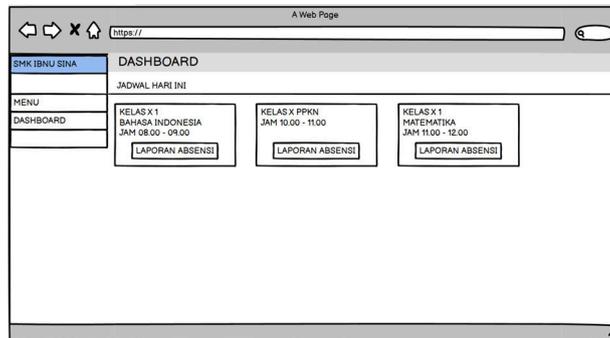


Figure 11. Student Dashboard Page

3. Teacher Attendance Monitoring Page

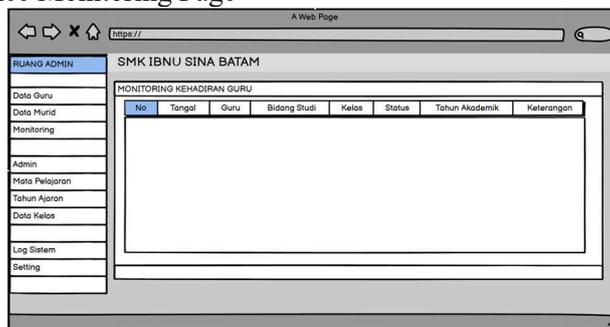


Figure 12. Teacher Attendance Monitoring Page

Comparison Analysis with the Manual System.

Table 1. Comparison Between Manual System and Web-Based System

Aspect	Manual System	Web Based System
Recording Speed	Slow	Fast (real-time)
Potential Errors	High (human error)	Low (automation)
Data Transparency	Limited	Accessible anytime
Security	Susceptible to manipulation	Authenticated and encrypted
Attendance Report	Must be calculated manually	Automatic and exportable

Based on this comparison, the proposed web-based system is superior in terms of speed, accuracy, and data security compared to the manual methods that have been used at SMK Ibnu Sina Batam.

Implications of System Implementation

If this system is fully implemented, several benefits can be achieved, including:

1. **Increased Efficiency**
An automated attendance system enables real-time recording of teacher attendance, reducing the time required compared to manual methods such as logging attendance in books or signing attendance sheets. This allows the school to focus more on academic aspects, such as curriculum development, teacher training, and improving the quality of student learning.
2. **Data Transparency**
Teacher attendance data will be stored centrally and can be accessed by school management at any time. With a digitalized system, school principals and administrative staff can monitor attendance without waiting for manual recapitulation. Additionally, stored data can be analyzed to identify attendance patterns, tardiness, or unusual absences, allowing for quicker corrective actions.
3. **Reduction of Human Error**
Errors in attendance recording are common in manual systems due to negligence, inaccuracy, or potential data manipulation. Through automation, attendance data is recorded directly by the system using technologies such as RFID, fingerprint scanning, or facial recognition, minimizing the risk of recording errors and system misuse.
4. **Improved Discipline**
This system can be equipped with real-time notifications sent to teachers or school management in cases of tardiness or absence. With periodic reports and automated monitoring, teachers become more aware of the importance of attendance discipline. Additionally, historical attendance data can be used for teacher performance evaluations and serve as a basis for providing incentives or sanctions based on attendance records.

CONCLUSION

Based on the research findings and analysis, it can be concluded that the development of a teacher attendance monitoring system mock-up at SMK Ibnu Sina Batam provides a more efficient solution compared to the manual methods previously used. The designed web-based system improves attendance recording accuracy, speeds up data recap processes, and enhances transparency in reporting.

The needs analysis results indicate that the manual system has several limitations, including delays in recording, the risk of data loss, and restricted real-time access to information. With the implementation of a web-based system, attendance recording can be automated, data is securely stored, and attendance reports can be easily accessed by relevant stakeholders.

The system development process follows the prototype model, allowing user involvement at each stage of development. This approach ensures that the designed system aligns more closely with the school's requirements. The system mock-up includes key features such as a login page, dashboard, attendance recording form, and management features for teacher data and teaching schedules.

From the system design evaluation, it can be concluded that the web-based teacher attendance monitoring system offers advantages in terms of speed, accuracy, transparency, and data security compared to manual methods. The implementation of this system is expected to improve teacher attendance discipline, facilitate attendance monitoring for school administrators, and support the enhancement of academic administration quality at SMK Ibnu Sina Batam.

SUGGESTION

Based on the research findings, several recommendations can be made for future development:

1. As a next step, the system can be further developed into a fully implemented application within the school environment.
2. To enhance data accuracy and security, the system can be improved by integrating fingerprint scanning or facial recognition as an authentication method for attendance.
3. Given the increasing use of mobile devices, developing a mobile-based application would facilitate more flexible access and attendance recording.
4. Advanced attendance data analysis features, such as tracking teacher attendance trends over specific time periods, can be added to support school management decision-making.
5. To ensure optimal system performance, direct trials in the school environment and periodic evaluations should be conducted to gather user feedback.

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