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Research article

Implementation of Web-Based Counseling System at SMK Negeri 1 Sukawati

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ABSTRACT

State Vocational High School (SMK) Negeri 1 Sukawati, located in Gianyar Regency and renowned for its excellence in the field of visual arts, had a total of 533 students in the 2023/2024 academic year. As part of its efforts to enhance the quality of education, the school has implemented a Guidance and Counseling (BK) program aimed at helping students develop self-awareness, improve self-confidence, and behave in accordance with school regulations. One of the key components of this program is the student violation recording system. Currently, the process of recording violations is carried out manually using BK logbooks and Microsoft Excel, which is time-consuming and requires a high level of accuracy. This becomes a significant challenge considering the large number of students and the variety of infractions that need to be documented.

This study aims to design and implement a web-based guidance and counseling information system to facilitate a more efficient and accurate method of recording student violations. By utilizing a web-based system, the recording process can be automated, data retrieval becomes easier, and student or parental summons can be generated automatically once certain violation thresholds are reached. The focus of this research is the development of a system that enables guidance counselors to report student violations more easily, contributing to improved student discipline. The implementation of this system is expected to enhance the efficiency of violation data management and support the school's efforts in fostering better student discipline.

1. Introduction

SMK Negeri 1 Sukawati is a vocational high school located in Gianyar Regency, known for its excellence in the field of fine arts. In the 2023/2024 academic year, the school had a total of 533 students. To enhance the teaching and learning process, the school implements one of its key programs, namely the Guidance and Counseling (BK) program. Guidance and counseling services are essential components that must be provided in schools to support the development of students both individually and in groups [1]–[3]. The term "Guidance and Counseling" is derived from two words: guidance and counseling, referring to the support or assistance provided by professionals to help individuals overcome their personal problems [4], [5]. This program aims to help students understand themselves and their environment [6], [7], build self-confidence, and behave ethically and in accordance with school rules implemented at SMK Negeri 1 Sukawati [6], [8], [9].

To achieve these objectives, the guidance and counseling program includes a violation recording system. At SMK Negeri 1 Sukawati, this system involves documenting student violations, where the counseling provided is based on the severity of the offense committed. The individuals authorized to record violations include teachers, student council (OSIS) members, and all educational staff at the school. The current process begins with recording the violation in the BK logbook, followed by data

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compilation using Microsoft Excel, which is then printed as a formal report. This manual system is time-consuming and requires high accuracy, especially considering the large number of students and the variety of offenses recorded [10].

The introduction of a web-based guidance and counseling information system at SMK Negeri 1 Sukawati aims to simplify the process of recording student violations. This system facilitates efficient tracking of offenses committed by students and enables easier access to past records. If a student commits violations three times, the system automatically triggers a process for summoning both the student and their parent or guardian. The focus of this research is to design a web-based guidance and counseling information system that supports counseling services and allows BK teachers to generate violation reports more easily, thereby encouraging students to comply with the school's established rules. Based on the background described above, the main problem to be addressed in this study is: How to design and develop a web-based guidance and counseling information system for SMK Negeri 1 Sukawati.

2. Materials and Methods

2.1 Research Procedure

The research method used in this study is the waterfall method. In general, the flow of this research can be seen in the figure below.

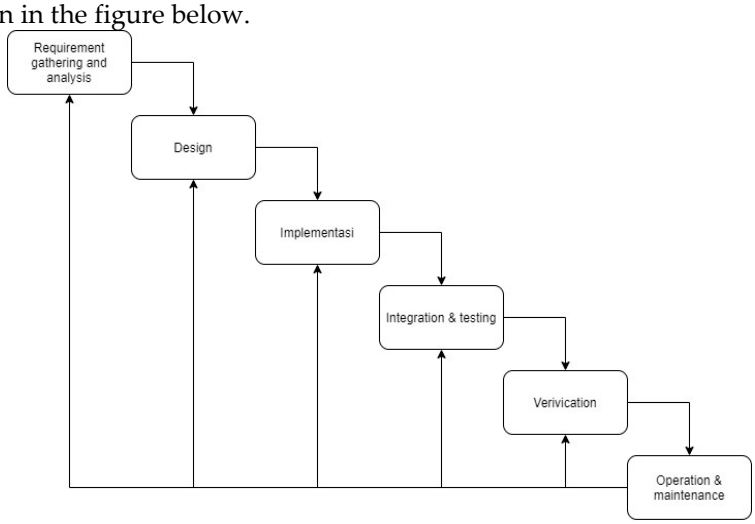

Fig. 1. Waterfall Method

The implementation of the research method used in this study is as follows:

1. Requirement Gathering and Analysis

At this stage, the researcher conducts data collection and needs analysis as the foundation for designing the guidance and counseling information system. Data collection is carried out through interviews with the Guidance and Counseling (BK) teachers at SMK Negeri 1 Sukawati. Based on the interview results, it was found that counseling data is obtained through counseling record forms, counseling sessions, and direct interactions between students and BK teachers. BK teachers routinely document each counseling session, evaluation results, and student progress to monitor their development. In addition to interviews, the researcher also performs user needs analysis to understand the expectations and requirements from both students and BK teachers. This analysis aims to ensure that the designed system can optimally support the guidance and counseling process within the school environment.

2. Design

The next stage involves designing the system architecture and user interface to meet the identified needs. The process includes creating flowcharts to clearly and systematically depict the violation recording process. Additionally, the user interface (UI) is designed to be intuitive and user-friendly, enhancing comfort and efficiency in system operation. Furthermore, a structured database model is developed to store essential information such as violation data, student data, and reports, supporting effective and integrated data management.

3. Implementation

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The main focus of this research is to develop the system according to the design specifications. This process involves utilizing relevant programming languages and frameworks, such as PHP and MySQL, to build an optimal web-based application. Features implemented include a login system for teachers, student violation recording, and generation of summary reports. This phase aims to ensure that all functions operate optimally, support user needs, and improve the effectiveness of the guidance and counseling process.

4. Integration & Testing

During the Integration & Testing phase, the objective is to combine all system components and verify their performance through a series of tests. Steps include integrating various modules within the system, such as the violation recording module, report generation, and user management, to ensure they function cohesively. Functional testing is then conducted to confirm that each feature works properly according to requirements.

5. Verification

This process is conducted to ensure that the system meets all established requirements. It involves verifying that all features operate as intended and fulfill user expectations. Additionally, checks are performed to ensure the system can efficiently handle the volume of student and violation data without compromising performance or operational speed.

6. Operation & Maintenance

The Operation & Maintenance stage involves deploying the completed system and conducting routine maintenance. Activities include training BK teachers to ensure they understand how to use the system optimally.

2.2 Data Sources and Research Subjects

The data sources for this research were obtained directly from the Guidance and Counseling (BK) teachers at SMK Negeri 1 Sukawati. Data collection was conducted using two primary methods: interviews and direct observation. Interviews were carried out to explore information related to the practices and processes of guidance and counseling activities, while observations were conducted to gain a deeper understanding of the dynamics of the counseling activities within the school. These two methods enabled the researcher to obtain diverse and comprehensive data regarding the existing system in the field.

2.3 Data Collection

The data collection methods consist of two types: primary data collection and secondary data collection.

1. Primary Data Collection

Primary data collection was conducted through interviews with the Guidance and Counseling (BK) teachers. The researcher obtained detailed information regarding the guidance and counseling process at the school. Data related to guidance and counseling were gathered from several sources, including counseling record forms, counseling sessions, and direct interactions between students and BK teachers. The counseling record form is used as a tool to document important information related to the counseling process received by students, including issues faced, counseling objectives, and steps taken during the sessions. Additionally, each counseling session is recorded in detail by the BK teacher, covering topics discussed, student responses, and suggested follow-up actions. Besides the documentation on the forms, BK teachers also evaluate each counseling session to monitor student progress over time. These evaluations include assessments of behavioral changes, understanding, and student readiness to face the problems encountered. Overall, the direct interaction between students and BK teachers, both during counseling sessions and other activities, plays a crucial role in documenting the development of each student. This process ensures that every step in guidance and counseling is well recorded, enabling appropriate actions based on the individual needs of the students.

2. Secondary Data Collection

In developing this system, the researcher referred to several journals that have been read and studied, and applied the waterfall method to design the system to be built. The waterfall method was chosen due to its structured and systematic nature, which is highly suitable for the stages required in developing the web-based guidance and counseling information system at SMK Negeri 1 Sukawati.

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Furthermore, the researcher utilized various journals and previous studies that were researched to deepen the concepts and techniques proven effective in developing similar systems. These references greatly assisted in facilitating the system design that fits the needs and context of guidance and counseling at SMK Negeri 1 Sukawati. By leveraging this secondary data, it is expected that the system development process will run more efficiently and yield more optimal results.

2.4 System Design

Based on the analysis conducted, the researcher was able to identify the necessary requirements for the system. It is expected that the developed system can address the existing problems at SMK Negeri 1 Sukawati and fulfill the desired expectations. The system design is divided into several sub-sections, which will be explained as follows:

2.4.1 Context Diagram

The Context Diagram provides an overall depiction of the web-based Guidance and Counseling Information System at SMK Negeri 1 Sukawati. This diagram illustrates the scope of the system and the main processes occurring within it. The Context Diagram represents the highest level of the Data Flow Diagram (DFD), depicting all inputs and outputs of the system, thereby offering a clear understanding of the interactions between the system's components as a whole. Figure 3.2 shows the Context Diagram for the Guidance and Counseling Information System at SMK Negeri 1 Sukawati.

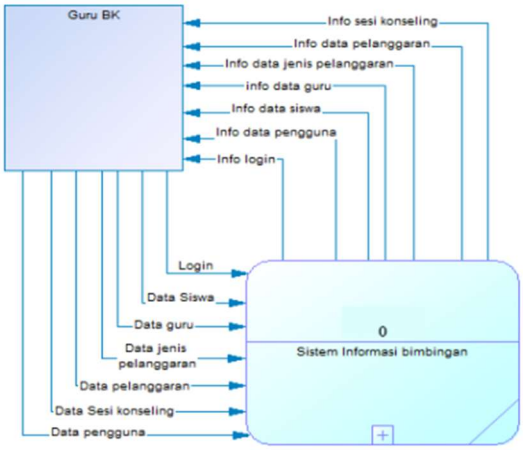

Fig. 2. *Context Diagram*

2.4.2 Data Flow Diagram Level 0

The Guidance and Counseling Information System at SMK Negeri 1 Sukawati, as illustrated above, emphasizes the role of teachers as the primary entities within the system. Teachers have access to various features and modules available, including management of basic data in the master data, as well as guidance and recording functionalities. Every interaction and data generated during the guidance and counseling process are stored in the database. A login/logout mechanism is implemented to regulate user access rights, ensuring that only authorized parties, such as teachers, can access and manage the data within the system.

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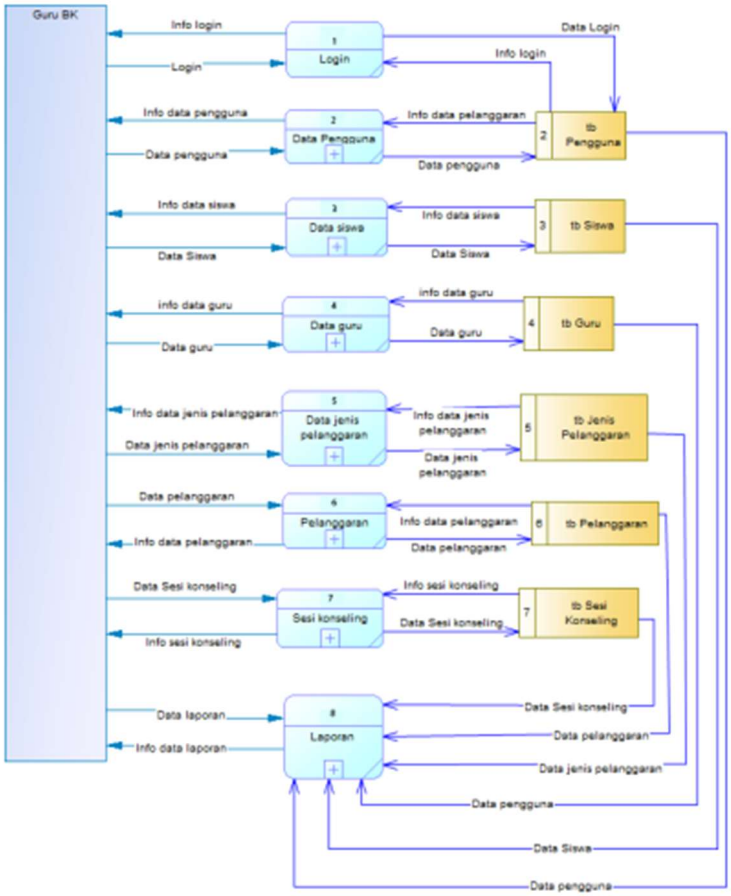

Fig. 3. Data Flow Diagram Level 0

2.4.3 Interface Design

The User Interface is the visual element of a website, application, software, or hardware that determines how users interact with the product. User interface design combines various concepts such as visual design, interaction design, and information architecture, with the primary goal of enhancing usability and user experience in interacting with the product. Good design can facilitate navigation and ensure that users can use the product efficiently and enjoyably.

1. Login Screen

On the login screen, there are two form fields that users must fill in to access the system, namely username and password. Users must enter valid information in both fields to proceed to the system. Below is the user login page interface.

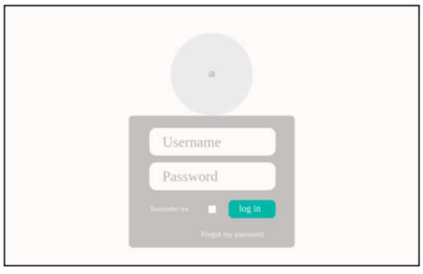

Fig. 4. Login Screen

2. Dashboard Screen

On the dashboard screen, users can view overall information related to the system, such as the total number of student data, guidance data, violation records, and awards data. Additionally, there is a table displaying outstanding students. This dashboard page provides a comprehensive overview of the system's status and progress in real-time. Below is the dashboard page interface.

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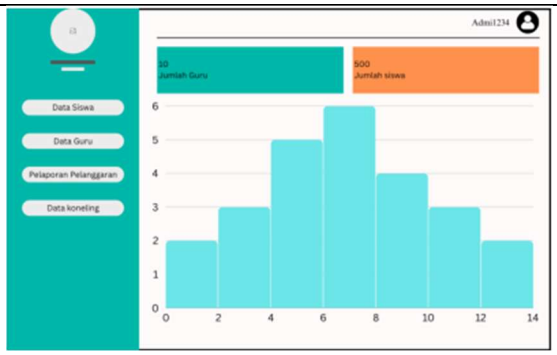

Fig. 5. Dashboard Screen

3. Student Data Screen

On the student data screen, users will find comprehensive information about each student along with their relationships. This page allows users to add new student data as well as provides options to print relevant student reports. With these features, users can easily manage and access student-related information. Below is the student data page interface.

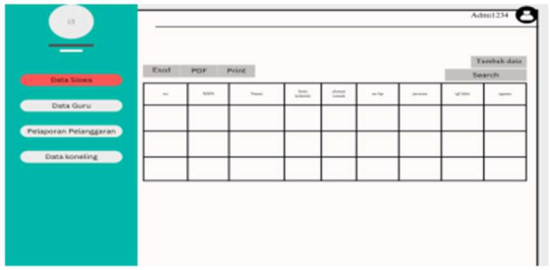

Figure. 6. Student Data Screen

4. Teacher Data Screen

On the teacher data screen, users will see comprehensive information about each teacher, accompanied by a table that displays the teacher data in a structured manner. This page is also equipped with a button to add new teacher data, as well as an option to print the recorded teacher data within the system. These features facilitate efficient management of teacher data for the users. Below is the teacher data page interface.

Figure. 7. Teacher Data Screen

5. Violation Reporting Data Screen

On the violation reporting data screen, information is provided about students currently facing issues. Teachers can input violation data along with the problems experienced by the students in this violation reporting section. This feature allows teachers to record and track the progress of the issues faced by students, enabling appropriate actions to be taken to assist the students effectively.

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Figure. 8. Violation Reporting Data Screen

6. Counseling Data Screen

On the counseling data screen, complete information regarding violations committed by students is displayed in a tabular format. Users can also add data on student violations and have the option to print violation reports. This feature enables teachers or authorized users to track and document student violations in a more structured manner.

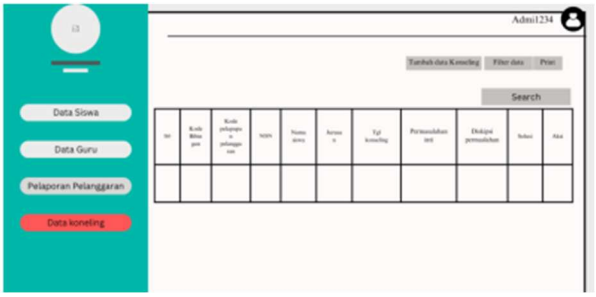

Figure. 9. Counseling Data Screen

3. Results and Discussion

3.1 System Implementation

Implementation is the stage of applying and testing the system based on the results of analysis and design that have been conducted. After the system design phase is completed, implementation is carried out to produce an information system that is ready to be operated. In the implementation phase, several steps are involved, ranging from data input processes to the generated output. This chapter explains the implementation of the design results transformed into a web-based Guidance and Counseling Information System application at SMK Negeri 1 Sukawati, which will be used to support the counseling process at the school.

1. Login Page

The login page is the first interface that appears when users access the website. Users must enter their username and password to log into the system. If a user forgets their password, they can select the "I forgot my password" option to reset the old password and replace it with a new one, allowing them to regain smooth access to the system.

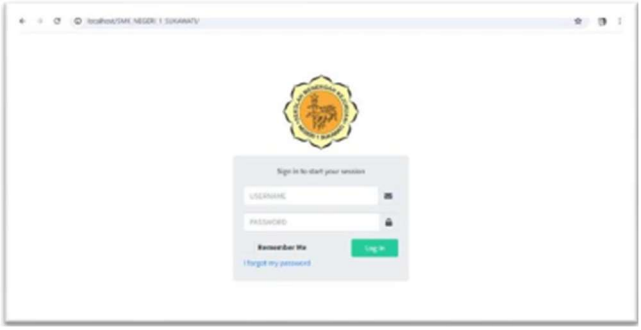
Figure. 10. Login Page

1. Dashboard Page

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This page is the main page displayed after a successful login to the system. On this page, information showing the number of teachers and students is presented, providing an overview of the data available in the system.

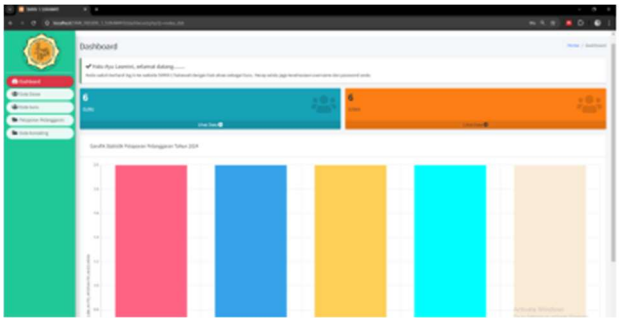

Figure. 11. Dashboard Page

2. Student Data Page

On the student data page, users can input and record complete information about students registered at SMK Negeri 1 Sukawati.

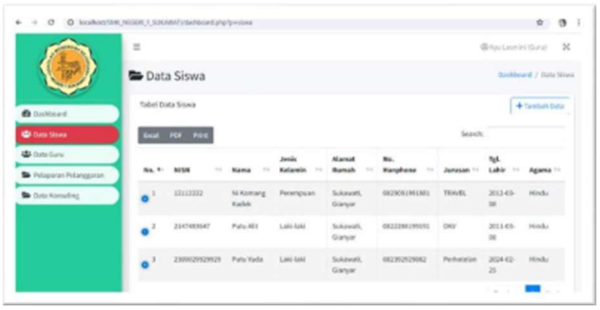

Figure. 12. Student Data Page

3. Teacher Data Page

On this teacher data page, users can input complete information about the teachers teaching at SMK Negeri 1 Sukawati, including their names, subjects taught, and other supporting data. This aims to record and store teacher data neatly and in an organized manner. For a more detailed explanation, please refer to Figure 3.4.

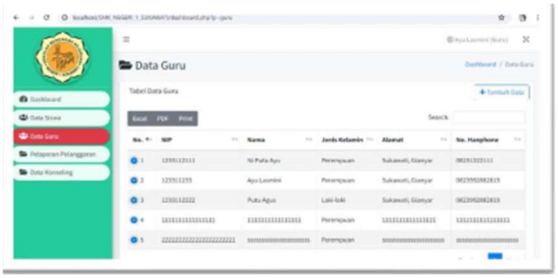

Figure. 13. Teacher Data Page

4. Violation Reporting Page

Next, on the violation reporting page, users can input violation report data which includes information such as the issue code, teacher's ID number (NIM), student's name, the problem that occurred, the date of the violation, and the reason for the violation. After all the fields are completely filled, users will click the save button as shown in Figure 3.5.

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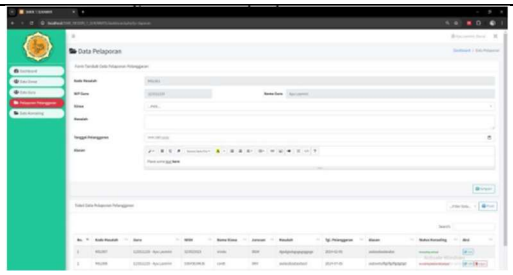

Figure. 14. Violation Reporting Page

5. Counseling Data Page

This page is the counseling data page that displays information about the counseling sessions conducted by the BK (Guidance and Counseling) teacher for students experiencing problems. The information can be seen in Figure 4.6.

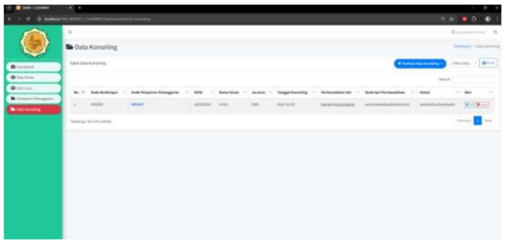

Figure. 15. Counseling Data Page

Table 1. Testing Scenario

Functions	Testing Scenario	Result	Explanation
Login	Login with a valid username and password	Able to display the main page and the system can be operated	Valid
Student Data	Add student data and fill in all the information correctly	Sistem menyimpan data siswa pada database The system saves the student data into the database	Valid
	Performing student data modification	The system successfully updates and saves the changes	Valid
Teacher Data	Adding teacher data and correctly completing all required information.	The system saves the teacher data into the database.	Valid
	Perform editing of teacher data.	The system successfully edits and saves the changes.	Valid
Violation Report	Adding violation report data and completing all data correctly	The system saves the violation reporting data into the database.	Valid
	The system successfully updates and saves the changes to the violation report data.	The system successfully updates and saves the changes.	Valid
Counseling Data	Adding counseling data and completing all data correctly.	The system saves the counseling data into the database.	Valid

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Functions	Testing Scenario	Result	Explanation
	The system successfully updates and saves the changes to the counseling data.	The system successfully modifies and saves the changes.	Valid

3.2 System Testing

System testing is conducted to ensure that the system functions properly and meets the expected requirements. This testing uses the black box testing method, which focuses on testing the system's functionality without considering its internal structure. The test results indicate that all forms in the system have functioned well according to expectations.

4. Conclusion

Based on the research results and discussion, the web-based guidance and counseling information system at SMK Negeri 1 Sukawati was designed using the structured design method (waterfall), which includes key stages such as event list design, context diagram, Data Flow Diagram (DFD), Conceptual Data Model (CDM), Physical Data Model (PDM), table structure, and user interface design. This application has a single user level, namely the admin, who has full access rights to manage master data, including student data, teacher data, violation reporting data, and counseling data. System testing was carried out using black box testing to verify functionality without directly examining the program code. The test results showed that the system operates well and meets the requirements and design specifications.

Author Contributions

The recommendation from this research for future studies is that the system can be further developed to be more comprehensive by adding features that enable direct communication with students' guardians to monitor the progress of guidance and counseling in real-time. Additionally, the system should be integrated with the report card assessment system to support holistic monitoring of students' academic and behavioral development.

Declaration of Competing Interest

We declare that we have no conflict of interest.

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