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Prototype of a Mobile-Based Application for Recording and Monitoring Student Counseling

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Abstract *- Counseling activities in schools need to be systematically recorded and monitored to ensure that students' issues and progress are well documented. However, in practice, these processes are often carried out separately, making it difficult for both schools and parents to effectively monitor student development. This study aims to design a mobile application prototype to support the recording and monitoring of student counseling activities. The proposed system involves four main actors: the counselor as the primary manager of counseling data, the homeroom teacher as the observer of student development, and the parents and the school principal with read-only access to support transparency and reporting. The system is developed using the SDLC with a Prototype model approach. Evaluation is conducted through scenario-based functional testing, which shows that the main features and system workflow are aligned with user needs.*
Keyword: *Mobile Application, School Counseling, System Prototype*

INTRODUCTION

The rapid development of information technology has strongly encouraged the adoption of digital systems across various aspects of the educational environment, including guidance and counseling services in schools. The use of such technology is considered capable of enhancing the effectiveness and quality of counseling services provided to students (Renaningtias et al., 2023; Sintya & Sintya, 2022). Furthermore, technological proficiency has become an essential competency that school counselors must possess to address contemporary counseling practices (Sabella et al., 2010).

However, in general practice, the process of documenting counseling outcomes in schools is still carried out manually and stored in separate archives. This condition makes it difficult for counselors to track students' problem histories and monitor the progress of interventions that have been implemented. In addition, observations of student development conducted by homeroom teachers are not yet integrated with counseling records. As a result, the overall counseling process becomes fragmented and less effective. In fact, well-structured and properly documented counseling records can significantly improve the quality of counseling services (Awalya et al., 2023; Idris et al., 2024). Consequently, the process of reporting counseling outcomes to parents, as a form of information transparency, and to school principals, as a form of summarized reporting, can be conducted more efficiently.

In line with the increasing digitalization in the field of education, various studies have developed mobile-based counseling applications as supporting tools for guidance and counseling services. (Malik et al., 2023), (Khomarudin et al., 2023), and (Sintya & Sintya, 2022) have demonstrated that mobile applications can be utilized to support counseling services across various aspects, such as basic services, career development, and student social mapping. Furthermore, the implementation of mobile-based e-counseling applications has been shown to be more efficient compared to manual documentation of counseling records (Rudi et al., 2023).

Nevertheless, most existing studies still focus on the general functions of counseling services or on addressing specific issues. For instance, several applications have been developed to support problem disclosure and to handle bullying cases experienced by students (Alwi et al., 2019; Harum et al., 1970; Rabbani & Zaky, 2024). However, the integration of counseling records, the student development observations, and intervention processes into a single structured system remains limited and has not been widely explored. In addition, the distribution of roles and access rights among involved stakeholders, such as counselors, homeroom teachers, parents, and school principals, has not been thoroughly examined (Sukirman et al., 2023).

To address these limitations, this study proposes a mobile-based application prototype that integrates counseling records, student development observations, and intervention processes into a unified system. The fundamental contribution of this study lies in the integration of workflows that connect four main stakeholders in real time. Unlike previous studies that primarily focus on counselor-centered

functionalities, this study offers a collaborative approach in which homeroom teachers can provide observations that are directly linked to counseling records. At the same time, parents and school principals are granted transparency through structured monitoring access rights.

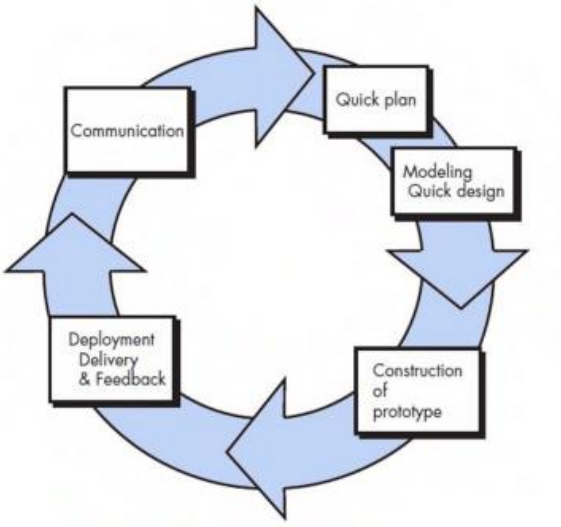
Therefore, this study focuses on designing a mobile-based application prototype involving four stakeholders with clearly defined roles and access rights, serving as a support system to enhance the effectiveness and transparency of student counseling services in schools.

RESEARCH METHOD

This study employs the Software Development Life Cycle (SDLC) using a Prototype model. The system involves four actors with different roles and is evaluated using a scenario-based evaluation approach.

1. System Development Method

The Software Development Life Cycle (SDLC) with the Prototype model was selected to develop this system prototype, as it allows developers to produce an initial version of the system that can be directly tested and evaluated by users. This process enables the collection of feedback, which can be used to iteratively refine and improve the system (Alfahri & Nisa, 2025; Pressman & Maxim, 2020), as illustrated in Figure 1. In contrast to other models, such as the Waterfall model, the Prototype model is considered more flexible and adaptable to user requirements throughout the system development process (Ningsih & Nurfauziah, 2023; Sommerville, 2021)



Source: https://www.researchgate.net/profile/Heru-Nugroho/publication/330907674/figure/fig1/AS:791918271287297@1565819437894/Software-Development-Life-Cycle-SDLC-Prototype-5.ppm

Figure 1. SDLC with Prototype Model

The flexibility of the Prototype model serves as a strong rationale for this study, as it enables functional validation of the integration of system workflows among four actors, namely the counselor, homeroom teacher, parents, and school principal. Through the iterative approach of this model, each role is ensured to have appropriate access rights and data connectivity, addressing the fragmentation issues previously identified in conventional counseling services and web-based systems in prior studies (Marisa et al., 2024).

Furthermore, the resulting prototype is not intended to be directly implemented as a ready-to-use application. Instead, it is utilized as a medium to visualize system functionalities, workflows, and the distribution of user roles in the counseling and student monitoring process, as also applied in previous studies (Nugroho et al., 2025; Putri et al., 2023).

2. Research Stages

The design of the mobile-based counseling application prototype was developed using the SDLC with the Prototype model, which consists of five main stages (see Figure 1):

a. **Communication**, which involves identifying problems and user requirements. In this study, this stage was conducted by analyzing the current counseling process in schools, particularly focusing on issues related to fragmented data management, lack of integration between counseling records and student development observations, and limited access to information for stakeholders.
b. **Quick Planning**, which involves formulating a system development plan based on the results of the requirement analysis. At this stage, the system scope, main features, and user roles were defined, including the interaction between counselors, homeroom teachers, parents, and school principals.
c. **Modeling Quick Design**, which involves developing a conceptual representation of the system in the form of use case diagrams and system workflows. The design emphasizes the integration of counseling records, student development observations, and intervention processes into a unified workflow.
d. **Prototype Construction**, which involves designing an interface prototype as an initial representation of the system requirements. In this study, the prototype focuses on key functionalities such as recording counseling records, inputting student development observations, managing intervention processes, and providing role-based access to stakeholders.
e. **Deployment, Delivery, and Feedback**, which involves testing the system interface and making adjustments based on user feedback until the

prototype meets the specified requirements. The evaluation is conducted using a scenario-based approach, where each actor performs specific tasks to validate system functionality and workflow integration.

3. Testing Techniques

The system prototype is evaluated using a scenario-based evaluation approach by developing various realistic usage scenarios based on the roles of each actor. This approach is used to assess the suitability of system functionalities and workflows within the developed prototype. This technique is selected because it effectively illustrates how users interact with the system in real-world contexts and facilitates the collection of user feedback, such as workflow clarity, ease of use, and feature suitability. This is particularly important for systems involving multiple actors with different roles (Carroll, 1997).

Furthermore, this approach is considered effective for system evaluation as it supports iterative improvements before full implementation, ensuring that the prototype aligns with user expectations and can be more readily accepted by users (Sharp & Preece, 2019).

RESULTS AND DISCUSSION

Based on the development method used in this study, namely the SDLC with Prototype model, the following five stages were carried out:

1. Communication

The communication stage was conducted to identify user problems and requirements through observations of counseling processes implemented in several schools. Based on the observation results, it was found that the recording of counseling outcomes is generally still performed manually, and the documentation of counseling histories is not integrated with monitoring results provided by homeroom teachers. This condition makes it difficult for schools to prepare counseling summaries as a reporting. Therefore, a system is needed to support the counseling service process and assist schools in generating counseling summaries more efficiently.

2. Quick Planning

Based on the results of problem identification and user requirement analysis conducted during the communication stage, system development began by determining the actors involved according to user needs. The proposed system involves four actors with different roles and access rights, as follows:

a. **Counselors**, serves as the primary actor responsible for managing counseling records, including recording students' counseling outcomes and documenting intervention actions provided to students within the system.
b. **Homeroom teacher**, serves as the actor responsible for observing student development within the classroom environment and recording the observation results in the system.
c. **Parents**, serve as monitors of their child's counseling records and counseling progress with read-only access.
d. **The principal school**, serves as the monitor of all counseling records at the school level with read-only access.

Additionally, the system provides a summary feature that presents a statistical overview of student counseling records based on specific periods. This feature is accessible only to counselors and the school principal for reporting and evaluation purposes.

3. Modeling Quick Design

The four actors, along with their respective roles and access rights within the developed system, were identified during the planning stage. These findings were then modeled into a use case diagram to illustrate each actor's interaction with the system, as shown in Figure 2.

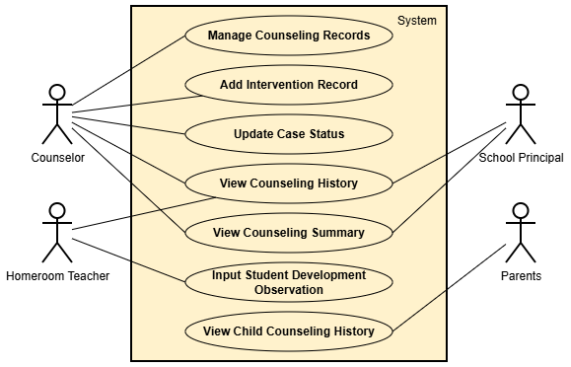


Figure 2. Use Case Diagram of the Proposed System

Based on Figure 3, the system workflow begins with a counselor conducting a counseling session directly with the student outside the system. After the session, the counselor records the counseling results in the system, including the issues experienced by the student as well as the initial intervention provided. The counseling records stored in the system can then be accessed by the homeroom teacher as initial information for observing the student's development within the classroom environment. Subsequently, the homeroom teacher records the observation results into the system as part of the ongoing monitoring process.

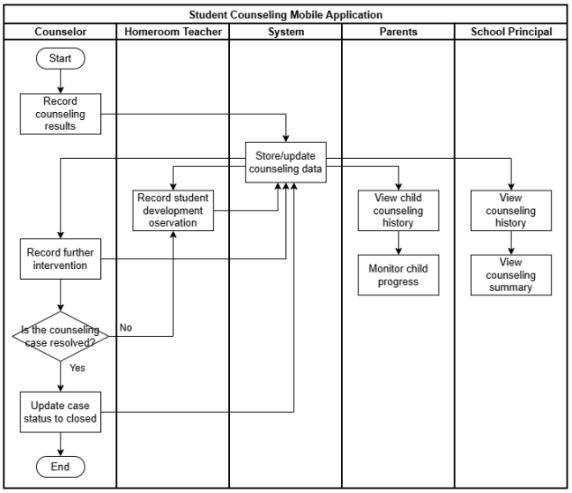


Figure 3. Workflow Diagram of the Proposed System

Based on these observation results, the counselor conducts an evaluation and provides further intervention to the student, then records the intervention into the system. This cycle of observation and intervention evaluation may occur repeatedly until the student's issue is resolved.

During this process, parents and the school principal can access the student's counseling records through the system with read-only access rights for reporting and monitoring purposes. Additionally, the counselor and the school principal can periodically access the student counseling summary feature. This workflow demonstrates that the proposed system is able to support continuous collaboration among stakeholders throughout the counseling process.

4. Prototype Construction

Following the modeling and design stages, the next step is prototype development, which represents the workflow of the counseling service. The prototype interfaces presented in this study use the Indonesian language, considering that the intended users are school stakeholders in Indonesia. The prototype covers the recording of student counseling results by the counselor (see Figure 4), the recording of student development observation results by the homeroom teacher (see Figure 5, left side), the recording of intervention actions by the counselor (see Figure 5, right side), and the monitoring of counseling records by parents and the school principal (see Figure 6).

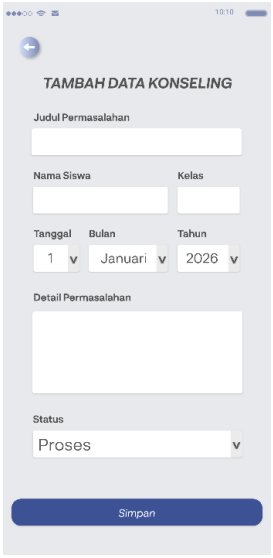


Figure 4. Counseling Data Input Interface for the Counselor

In terms of interface design, the prototype for counseling records is developed using a similar structural layout. However, each interface is differentiated by additional components and actions according to the role of each actor. This prototype design indicates that the system applies a consistent user interface while maintaining role-based functionality for each stakeholder.

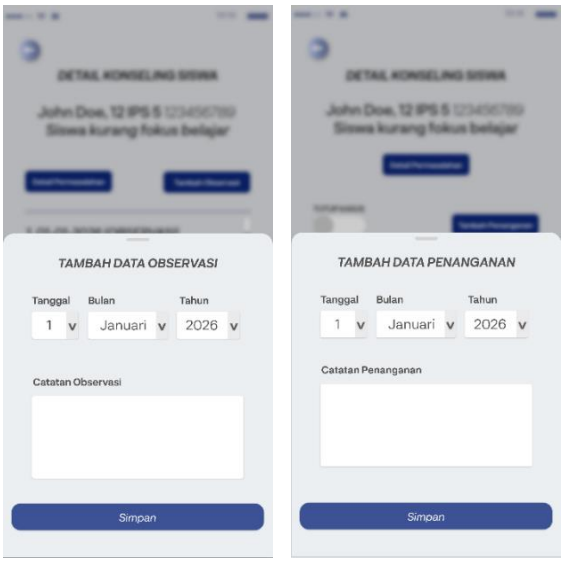


Figure 5. Observation Results Input Interface for the Homeroom Teacher (left) and Intervention Results Input Interface for the Counselor (right)

First, the interface design for the counselor role provides a button to add intervention records and a toggle switch to manage the case status (see Figure 7, left side). As long as the toggle switch remains active (case open), the homeroom teacher can submit observation results and the counselor can record additional intervention results. When the switch is

changed to the inactive state, the case is considered closed. As a result, the observation and intervention input features are no longer available in the system, as shown in Figure 8. This mechanism ensures that the counseling process remains structured, where only active cases can receive further observations and interventions.

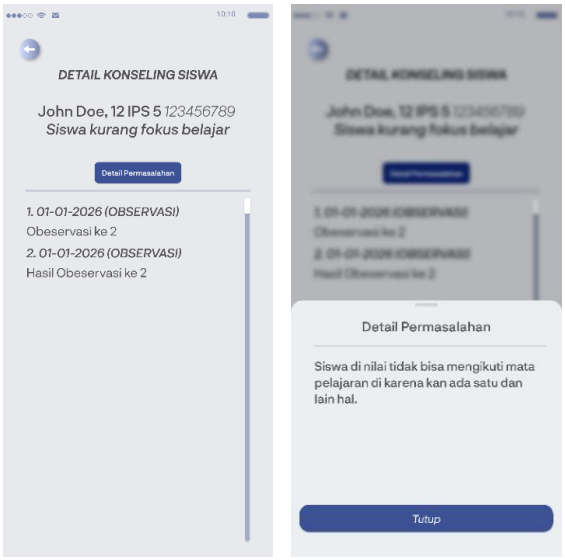


Figure 6. Student Counseling Records View (left) and Issue Detail View (right) for Parents and the School Principal

Second, the interface design for the homeroom teacher role provides a button to add student development observation results (see Figure 7, right side).

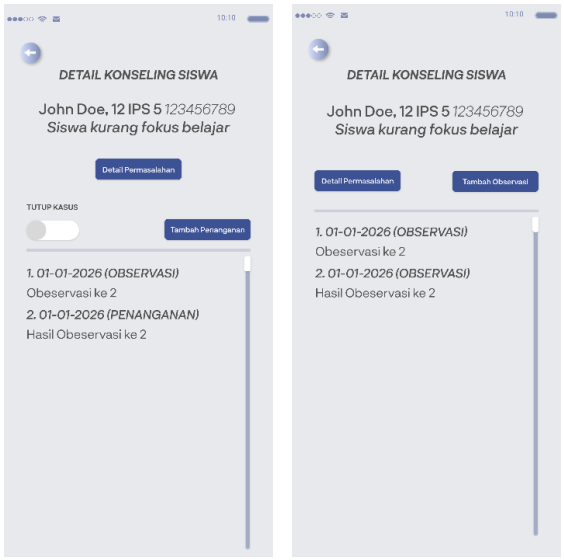


Figure 7. Student Counseling Records View for the Counselor (left) and the Homeroom Teacher (right)

Third, the interface design for parents and the school principal provides only a single button to open the detailed view of student issues (see Figure 6, left side). This feature is also available in interface design of all user roles, without additional components.

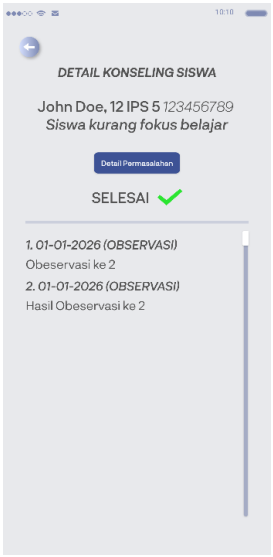


Figure 8. Student Counseling Records View with Closed Case Status

The homepage (start page) interface is also differentiated according to each user's role. **The counselor**, as the primary user, is provided with an interface containing three menus: **Input Counseling Records**, **View Counseling History**, and **View Summary** (see Figure 9, left side). **The homeroom teacher**, who is responsible for observing student development in the classroom environment, is provided with an interface that directly displays a list of students who have participated in counseling (see Figure 9, right side). **Parents**, who serve as monitors of their child's counseling records, are provided with an interface containing the **View Counseling History** menu, which only displays their child's counseling data with read-only access rights, as well as a **Contact Us** menu (see Figure 10, left side). Finally, **the school principal**, who acts as the monitoring actor at the school level, is provided with an interface containing a menu to view counseling histories for all students and a menu to view summaries (see Figure 10, right side). This role-based homepage design demonstrates that the proposed system prioritizes usability by presenting functions according to the

specific needs of each actor.

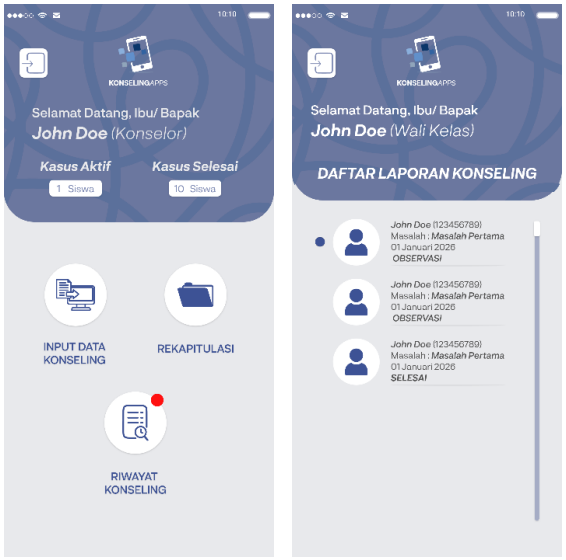


Figure 9. Homepage Interface for the Counselor (left) and the Homeroom Teacher (right)

In addition, the **counseling summary** feature, which is available only to counselors and the school principal, is designed to display statistics in the form of numerical indicators and pie charts, as shown in Figure 11. This feature presents information regarding the number of counseling cases that remain open and the number of cases that have been closed.

The presentation of data in this visual format is intended to help users understand the overall condition of counseling services without having to review each case individually. The information provided through this feature can be utilized for reporting purposes as well as for evaluating counseling services implemented by the school. This feature indicates that the proposed system not only supports operational counseling activities, but also facilitates managerial decision-making through concise and accessible data visualization.

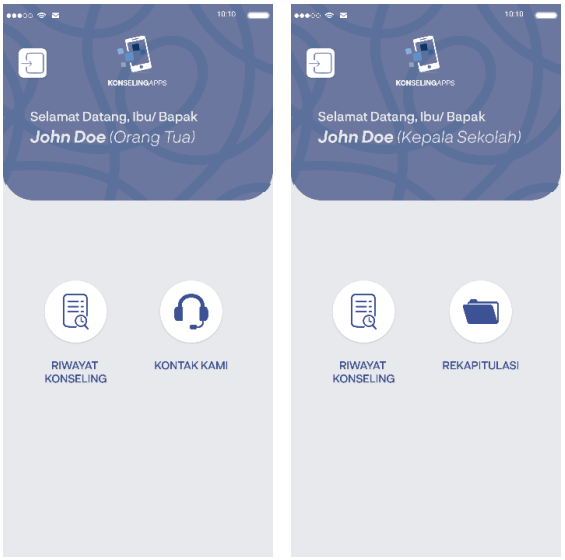


Figure 10. Homepage Interface for Parents (left) and the School Principal (right)

Figure 11. Counseling Summary Dashboard View for the Counselor and the School Principal

5. Deployment, Delivery, and Feedback

This prototype was evaluated using a scenario-based evaluation approach focused on assessing interaction workflows and user interface design to ensure that each feature accurately represents user requirements and the designed system workflow. Testing was conducted by examining the alignment between the prototype interface, usage flow, and the scenarios defined in the designed use cases. Table *1* shows that all evaluated features and workflows functioned according to the expected scenarios and were declared valid. The prototype is conceptually capable of representing the system workflow and users' functional requirements, both in the main counseling process and in supporting features. Furthermore, the access rights configuration ensures that each actor receives information according to their respective

roles, thereby enabling the counseling service workflow to be well coordinated.

The results of testing across all scenarios indicate that integrating counseling records from counselors with observation data from homeroom teachers can minimize data fragmentation, as commonly found in conventional systems. In addition, the case status control feature enables counselors to ensure that every stage of the counseling process is properly documented, while allowing parents to monitor progress in real time and transparently without compromising the integrity of the primary data. Therefore, the designed mobile-based counseling application prototype is considered suitable to serve as a foundation for further development and future implementation as a functional application in subsequent studies.

Table 1. Evaluation Results Using Scenario-Based Evaluation

No.	Evaluated Aspect	Scenario	Expected Results	Evaluation Results	Notes
1	Counseling workflow	Tracing the user workflow	Workflow matches the designed flowchart	As expected	Valid
2	Access right for each actor	Checking each actor's interface according to assigned roles	Interface matches each actor's role	As expected	Valid
3	Counseling record input feature for counselor	Checking the counseling record input interface	Feature is available	As expected	Valid
4	Observation input feature for homeroom teacher	Checking the observation input interface	Feature is available	As expected	Valid
5	Intervention input feature for counselor	Checking the intervention input interface	Feature is available	As expected	Valid
6	Counseling history feature for each role	Checking the counseling history interface for each role	Feature is available	As expected	Valid
7	Counseling summary feature for counselor and school principal	Checking the counseling summary interface	Feature is available	As expected	Valid

CONCLUSION

This study aimed to design a mobile-based counseling application prototype capable of representing the system workflow and users' functional requirements. Based on the evaluation results, the developed prototype is considered capable of supporting counseling services through counseling record management, monitoring processes, and role-based access rights for each actor involved. Therefore, the objectives of this study have been successfully achieved, and the designed prototype is considered suitable to proceed to the implementation stage as a functional application.

For future development, this prototype can be implemented as a real application and enhanced with usability testing and system performance evaluation to assess its effectiveness when used directly by users.

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