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User Interface Design and UML-Based Modeling for an Internship Monitoring and Evaluation Information System

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ABSTRACT

Conventional internship monitoring workflows frequently suffered from critical inefficiencies, including data fragmentation, delayed reporting, and subjective performance evaluations. Furthermore, existing literature on system design often prioritized backend logical structures while neglecting frontend visual usability, resulting in functional but difficult-to-use applications. This study aimed to address these specific gaps by designing a comprehensive internship monitoring and evaluation system that explicitly integrated strict Unified Modeling Language architecture with high-fidelity user interface design at the conceptual level. The methodology utilized a qualitative descriptive approach, employing specific structural diagrams including use case, activity, and sequence diagrams to enforce role-based access control and user-centered design principles. The results demonstrated that the proposed blueprint successfully ensured data integrity and atomicity. Validated through black box testing, the conceptual models were confirmed to be translated into a functional design without logical errors, enabling real-time activity tracking and objective assessment. This study contributed to information system design research by bridging strict data security standards with minimalist usability heuristics, providing a matured visual and structural foundation. The findings offered a concrete basis for future implementation and empirical validation using user acceptance testing in operational environments.

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1. INTRODUCTION

Rapid developments in information technology have prompted organizations to undergo digital transformation in order to improve efficiency, transparency, and data accuracy [1]. Computerized information systems enable data processing and analysis to be carried out quickly and effectively [2]. In its development, the user interface plays an important role because it affects user comfort, ease of use, and satisfaction [3]. The quality of the user interface often represents the entire system for users and is a major factor in the overall quality of software products [4].

Internship programs are an important means of bridging the gap between academia and industry needs through real-world work experience [5]. As business demands become increasingly complex, organizations require effective mechanisms to assess, control, and enhance employee productivity and performance contributions. Therefore, digitization is needed in the monitoring and evaluation process of interns so that their activities and progress can be recorded in a more structured and accurate manner [6].

Monitoring is the process of systematically collecting information on performance development over time [7], while evaluation is conducted to assess goal achievement, identify issues, and provide feedback for improving work quality [8]. Performance evaluation is also necessary to gather information based on assessment, relevance, efficiency, and impact, which will be used as a basis for decision-making [9]. A sound monitoring and evaluation process has proven to play an important role in supporting management and improving organizational effectiveness [10]. Therefore, a

technology-based monitoring and evaluation system is important for organizations to support faster, more accurate, and more efficient decision-making [11].

However, despite the importance of these processes, current internship monitoring practices often encounter critical limitations. Conventional methods, which typically rely on manual logbooks or disparate spreadsheet tools, are proven to be time-consuming and prone to human error [12].These constraints lead to delayed feedback, high subjectivity in performance evaluations due to unstructured records, and difficulty in tracking the long-term progress of interns. Without a centralized and integrated system, organizations struggle to maintain data consistency and ensure an objective assessment process.

Problems arise in the monitoring and evaluation process of internships at PT Indonesia Comnets Plus (ICON+) Regional Sumbagut, where the recording of intern activities is still done using Google Forms that are not integrated. This condition makes it difficult for intern to compile reports or logbooks systematically, and does not provide a centralized platform for recording their daily activities. Logbooks play an important role in documenting activities, competency development, and continuous performance reflection of interns [13]. The process of accurate and comprehensive evaluation is further hampered by late reports, unintegrated attendance records, and a lack of documentation of feedback from field mentor, which further hinders the process of accurate and comprehensive evaluation. This situation makes the need for a structured monitoring and evaluation system an urgent priority for the company in order to ensure transparency, accountability, and efficiency in the implementation of the internship program [14].

To address these issues, a web-based monitoring and evaluation system design with an intuitive, user-friendly interface that can be customized to user needs is required. One modeling or design tool that can be used is Unified Modeling Language (UML). UML is a standard modeling language in software engineering that serves as a common communication medium between system developers [15]. UML diagrams provide many types of static and dynamic diagrams to explain the system to be developed [16]. Figma can used to create an organized and consistent user interface that follows user interface design principles. With the collaboration feature, team members can work together on the same design file even if they are in different locations. Each team member can provide suggestions, give comments, view edits made by other team members, and create user interfaces that enable a better user experience [3]. The use of tools is expected to facilitate interface layout and user experience in line with user expectations [17].

A number of previous studies have shown that UML is a widely used standard in information system modeling. Anardani et al., it was mentioned that UML diagrams have been proven to facilitate communication between users and developers and reduce errors in the design process [18]. Similarly, Yanto et al. showed that UML modeling improves data management effectiveness in study program information systems [19]. In the specific context of academic administration, Narulita et al. applied UML for research management systems [20], while Hanifa and Syahputra utilized it to design a web-based internship monitoring tool [21].

However, a critical comparison of these previous studies highlights a specific gap. While Hanifa and Syahputra successfully addressed the functional needs of internship monitoring [21], their study—along with Anardani et al. and Narulita et al. tends to prioritize logical structure (backend) over visual usability (frontend) [18] [20]. Most prior works produce abstract diagrams that, while technically accurate, do not fully represent the user interaction experience before development. The novelty of this research lies in bridging this gap by explicitly integrating strict UML architectural modeling with high-fidelity Figma-based UI design. Unlike previous studies that focus heavily on structural documentation, this research produces a comprehensive design artifact that validates both the system's logic and the user experience simultaneously.

Therefore, this research is important to provide a conceptual and visual foundation in the development of information systems that can improve the effectiveness of the internship monitoring and evaluation process and meet real needs in the field. The objective of this research is to design a user interface for an internship monitoring and evaluation system using UML modeling at PT Indonesia Comnets Plus Regional Sumbagut to support integrated data management, performance monitoring, and internship evaluation.

2. RESEARCH METHOD

This study uses a qualitative descriptive approach because it focuses on understanding the conditions of ongoing internship monitoring and evaluation. The qualitative descriptive approach is used to describe phenomena systematically and in depth based on actual conditions in the field without testing hypotheses or implementing systems. This approach is suitable for design research because it allows researchers to comprehensively understand user needs and work contexts, especially in internship activities that emphasize learning based on real work experience [22].

This research does not cover the system implementation stage, but rather produces design artifacts in the form of UML diagrams and user interface designs as proposed solutions. The focus on information system design is considered relevant because the development of internship support applications can significantly improve the efficiency of managing internship activities and documentation [23]. The exclusion of the full implementation phase is critically justified to ensure that the "system blueprint" is fully matured and validated against user needs before development resources are committed. This approach minimizes the risk of structural errors during future coding phases.

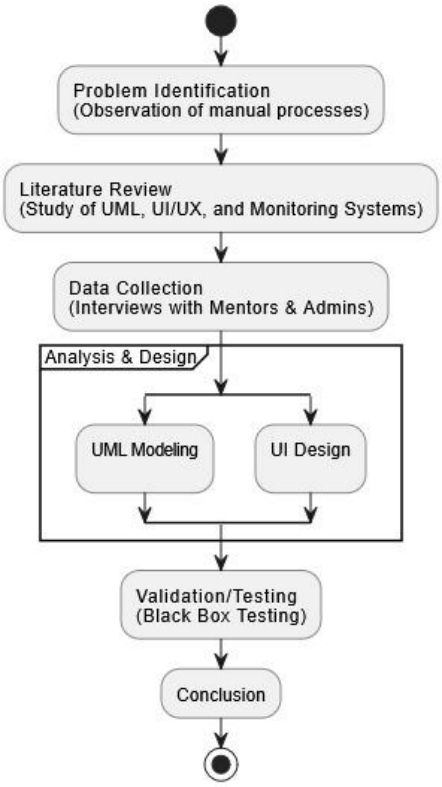

Figure 1. Research Methodology Stages (Source: Research Data, 2026)

To systematically achieve the research objectives, this study follows the stages illustrated in Figure 1. The process begins with Problem Identification to map the limitations of the current manual processes. This phase is followed by a Literature Review to examine relevant theories regarding UML, UI/UX, and monitoring systems. The Data Collection phase involves interviews with mentors and admins to gather functional requirements. The core of this research is the System Analysis & Design phase, which applies a dual approach: UML Modeling (Use Case, Activity, Sequence) to validate structural logic, and UI Design (Figma Prototyping) to ensure visual usability. The resulting design is then verified through Validation/Testing using the Black Box method to ensure alignment with requirements before drawing final Conclusions.

The qualitative descriptive research phase began with identifying existing conditions through direct observation of the monitoring and evaluation process of interns, which was still being carried out manually. This phase aimed to obtain an overview of the workflow, user roles, and issues that arose during the internship. A systematic monitoring and evaluation process is important because it serves as a means of feedback and continuous learning to improve the quality of program implementation and organizational decision-making [24].

This research was conducted at PT Indonesia Comnets Plus (ICON+) Regional Sumbagut because the monitoring and evaluation process for internships at that location had not yet been integrated into the system. This condition allowed researchers to conduct direct observations, identify user needs, and develop a system design that suited the actual needs in the field.

2.1 Data Collection Techniques

Data collection is the activity of searching for data needed to achieve the objectives of the problem at hand [2]. The following are the stages of data collection in this study.

1. Observations

Observations were conducted directly to understand the monitoring and evaluation process of internships and identify obstacles such as manual processes that cause delays and inefficiency [25]. Observation helps to gain a systematic understanding of ongoing activities, as defined by observation as the process of direct and systematic observation of research objects. [17].

2. Literatur Study

A literature study was conducted by reviewing journals, books, and previous research on monitoring, evaluation, information systems, UML modeling, and user interface design. The literature study was used to understand the theories related to the research [17].

2.2 System Requirements Analysis

The data obtained from observations and literature studies were analyzed descriptively to identify the requirements for an internship monitoring and evaluation system. The needs analysis focused on the functional and non-functional requirements of a system that supports the process of monitoring activities, recording logbooks, and evaluating the performance of interns. Identifying user needs is an important aspect because the user interface is the main representation of the system for users and greatly affects the effectiveness of user interaction with digital systems [26]. The results of this needs analysis form the basis for developing system specifications and designing the user interface structure.

2.3 System Modeling Using UML

Based on the results of the requirements analysis, the system design phase was carried out through modeling using Unified Modeling Language (UML). Unified Modeling Language (UML) is a modeling language used to describe the specifications, construction, and documentation of system components, which facilitates structured design [18], and chosen because it is capable of explaining workflows, object interactions, and system structures from various perspectives [27]. This study will use three diagrams, namely use case diagrams, activity diagrams, and sequence diagrams.

1. Use Case Diagram

A use case diagram is a preliminary design that looks at the various roles or interactions of the system with actors and determines how these roles function within the system [28]. Use case diagrams are used to detail the features or menus presented in the development of monitoring and evaluation systems [8].

2. Activity Diagram

An activity diagram illustrates the sequence of workflows or activities within a system, business process, or software menu. This diagram focuses on the activities of the system, not what the actors do [29]. In addition, activity diagrams also explain how each process flow begins, from how each flow starts, the decisions that may occur, and how the flow will end. [30].

3. Sequence Diagram

A sequence diagram is a diagram that explains the mechanism of message transmission and when it is applied. This diagram is arranged according to a set time frame [30]. This diagram shows the interactions between objects in a system in detail [25].

2.4 User Interface Design

User interface design is carried out after UML modeling is complete. The user interface serves as a medium of interaction between users and the system, so it needs to be designed to be easy to understand, consistent, and in line with user needs [3]. At this stage, the user interface design was developed using Figma. The user interface design includes the visitor page display, admin dashboard, mentor dashboard, and intern dashboard. The interface design was focused on supporting ease of use and user workflow in monitoring and evaluating internships.

3. RESULTS AND DISCUSSION

3.1 System Requirements Analysis Results

The analysis of system requirements, derived from direct observation of existing workflows, identifies critical functional inefficiencies in the current manual process. To address these gaps, the proposed system requires specialized data management capabilities that exceed standard administrative tools, ensuring strict data integrity. Key functional requirements include the implementation of a digital logbook for daily activity tracking and a real-time monitoring dashboard for mentors. Furthermore, the system is designed to facilitate a transparent performance assessment mechanism, specifically engineered to eliminate the subjectivity inherent in manual evaluation methods.

Regarding non-functional requirements, the system prioritizes Role-Based Access Control (RBAC) and Usability. The security architecture must strictly segregate access privileges among Admins, Mentors, and Interns to prevent unauthorized data manipulation. Additionally, the adoption of a web-based architecture ensures cross-device accessibility, creating a balanced system model that integrates technical robustness with operational ease of use.

3.2 System Modeling Results

1. Use Case Diagram

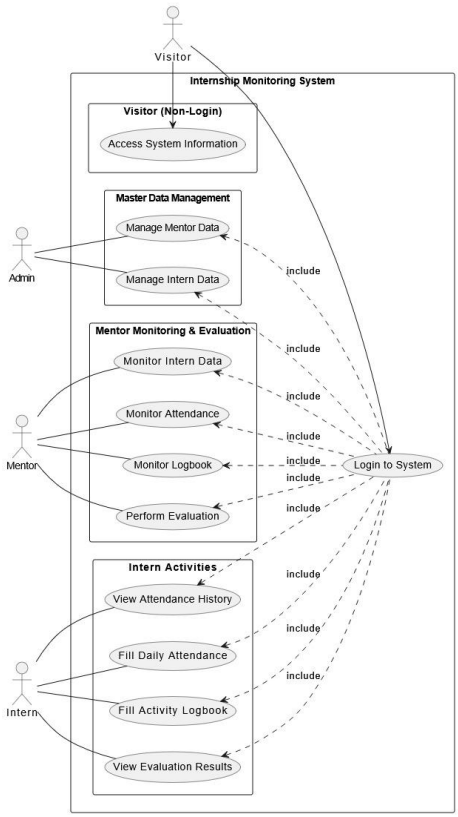

Figure 2. Use Case Diagram
(Source: Research Data, 2026)

The Use Case Diagram illustrates the architectural decision to implement strict Role-Based Access Control (RBAC). Unlike standard information system designs, this diagram establishes distinct boundaries among the Admin, Mentor, and Intern. This modeling approach is critical for mitigating the risk of data manipulation by ensuring that sensitive functions such as validating logbooks and entering assessment scores are accessed exclusively by authorized actors.

2. Activity Diagram

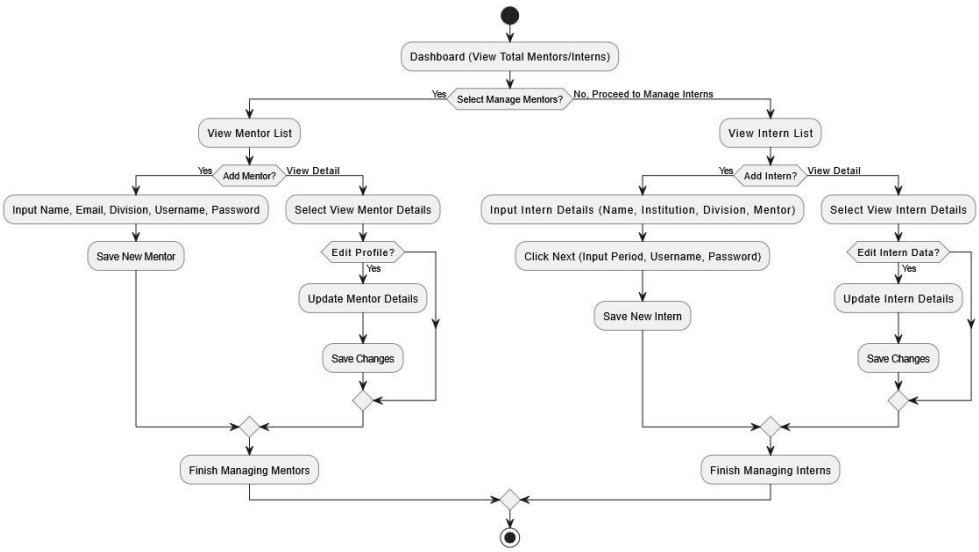

Figure 3. Admin Activity Diagram
(Source: Research Data, 2026)

The Admin Activity Diagram illustrates the Data Integrity Workflow. The CRUD processes performed by the Admin are modeled to ensure that any modification to master data is validated by the system. This addresses the limitations of previous spreadsheet-based methods, where orphan records were frequently encountered. By systematizing this flow, data consistency is ensured before the internship activities begin.

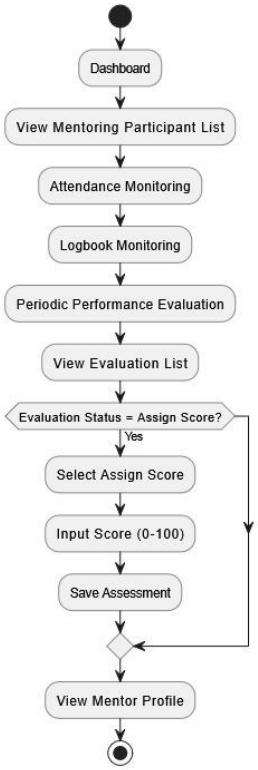

Figure 4. Mentor Activity Diagram
(Source: Research Data, 2026)

The Mentor Activity Diagram depicts the Monitoring Efficiency Workflow. As illustrated, the system integrates attendance verification and logbook validation into a single linear process. This logic aims to reduce the time spent by mentors on administrative tasks, thereby enabling them to focus more on providing guidance.

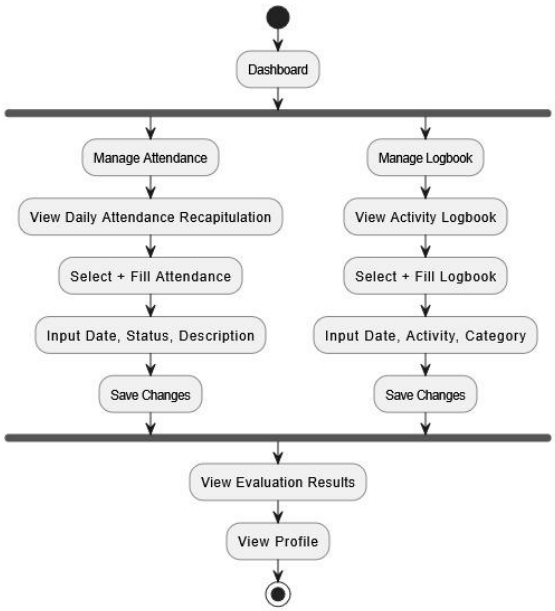

Figure 5. Intern Activity Diagram
(Source: Research Data, 2026)

The Intern Activity Diagram demonstrates the Structured Reporting Workflow. By implementing a sequential flow starting from the Dashboard, proceeding to Data Entry, and concluding with the Review Stage, the system guides interns in completing their administrative obligations systematically, thereby minimizing the likelihood of missed reports.

3. Sequence Diagram

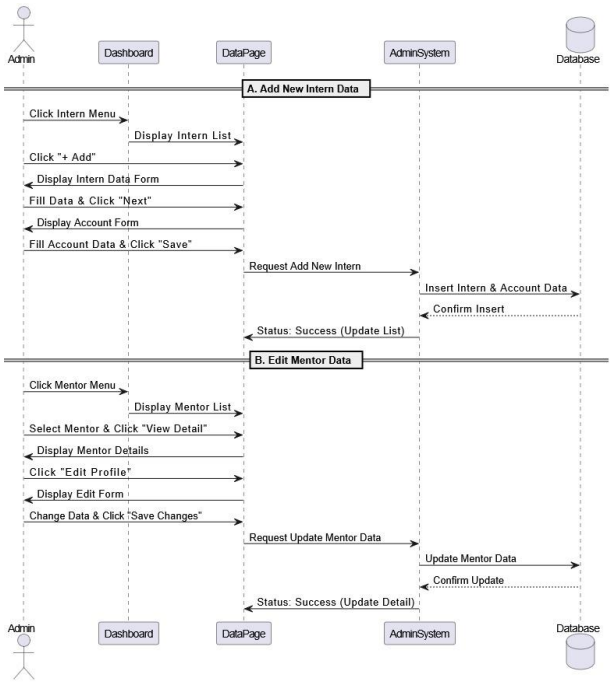

Figure 6. Sequence Diagram of Data Management by Admin
(Source: Research Data, 2026)

The Admin Sequence Diagram details the transaction lifecycle during data management, as shown in the following diagram. This diagram illustrates how the system maintains Atomicity ensuring that a data transaction (such as adding a new mentor) is either fully completed or completely rejected, in order to preserve database consistency.

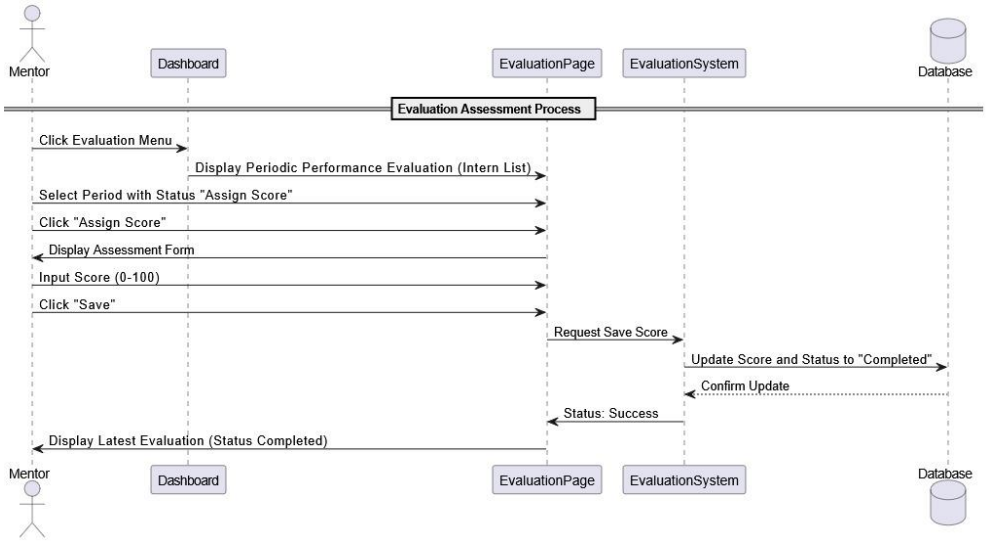

Figure 7. Sequence Diagram of the Participant Evaluation Process by the Mentor
(Source: Research Data, 2026)

The logic for the Evaluation Module is outlined in the diagram below. This sequence ensures that once scores are submitted by the mentor and committed to the database, the system triggers an automatic status update. This real-time processing eliminates the delays frequently encountered in manual grade recapitulation.

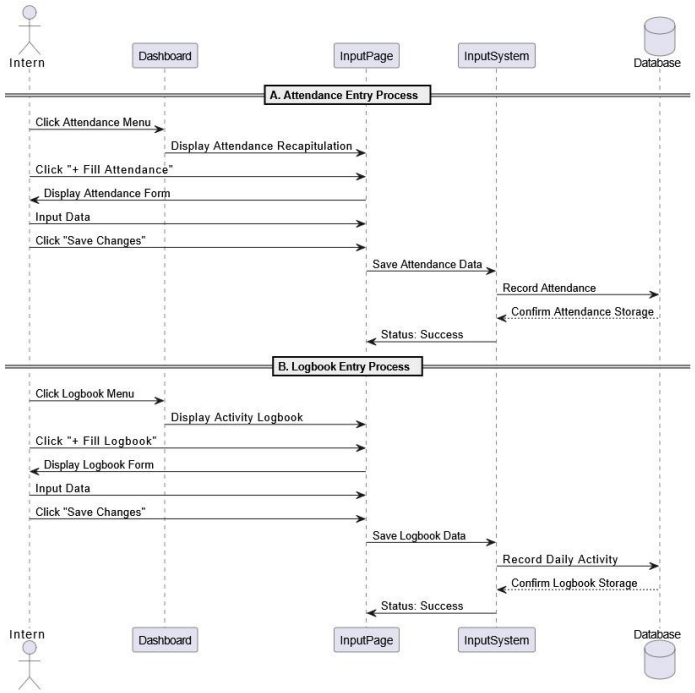

Figure 8. Sequence Diagram for Attendance and Participant Logbook Filling
(Source: Research Data, 2026)

This diagram validates real-time data transmission for daily activities. It illustrates the immediate feedback mechanism from the server to the user interface upon successful data entry, providing confirmation to the interns that their attendance has been securely recorded. Overall, the diagram ensures that every participant input is correctly processed and stored within the system and database.

3.3 User Interface Design Results

The user interface is designed using "Minimalist Design" heuristics, prioritizing clarity to support efficiency. To address the reviewer's suggestion on conciseness, only the key interfaces representing critical functions are presented below.

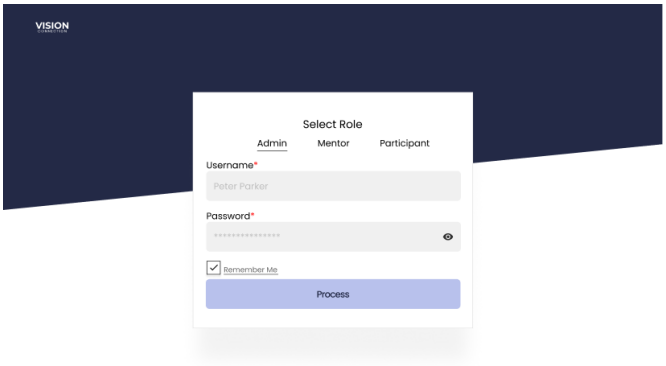

Figure 9. Login Page for Admin, Mentor and Intern
(Source: Research Data, 2026)

This interface serves as a secure access gateway. The page implements role-specific error handling (Admin, Mentor, Intern) to ensure adherence to best security practices right from the system entry point, preventing unauthorized access typically associated with open file systems.

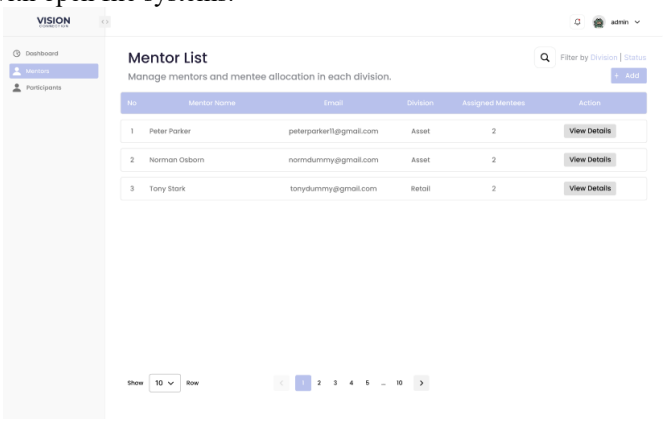

Figure 10. Mentor List Page
(Source: Research Data, 2026)

This page facilitates Workload Management. It allows admins to monitor the distribution of interns per mentor in real-time, a feature absent in manual records, ensuring that no mentor is overburdened.

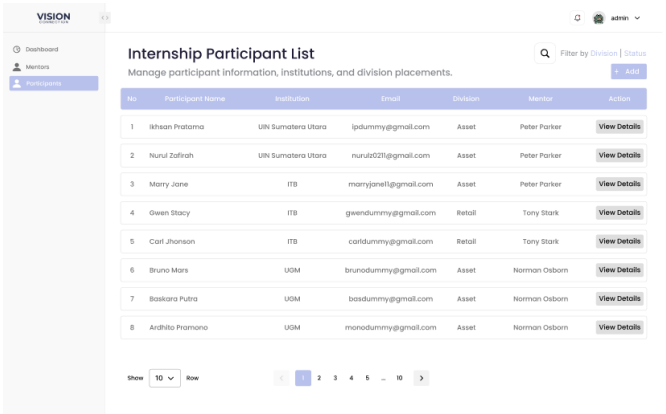

Figure 11. Internship Participant List Page
(Source: Research Data, 2026)

This interface represents the Centralized Data Repository. It eliminates data fragmentation by aggregating intern identity, institution, and placement into a single searchable view, vastly improving data retrieval speed compared to physical files.

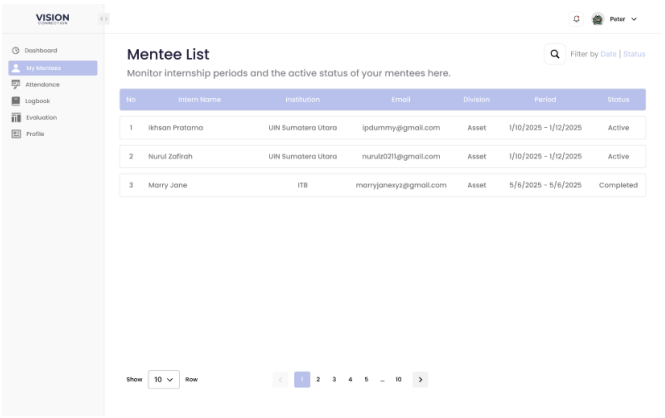

Figure 12. List of Mentoring Participants Page
(Source: Research Data, 2026)

For Mentors, this dashboard focuses on Operational Awareness. It provides a quick summary of all interns under supervision, allowing mentors to identify active participants instantly without needing to check multiple documents.

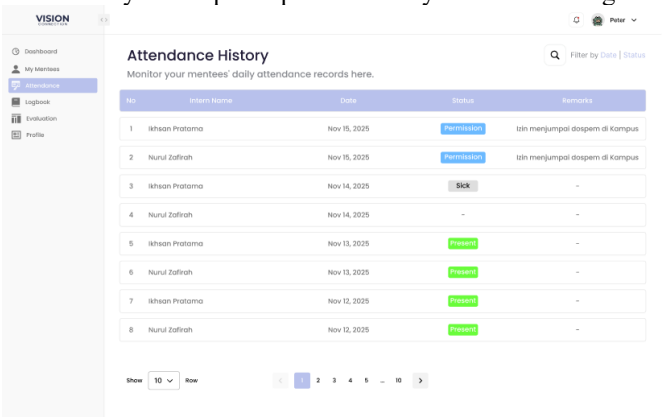

Figure 13. Participant Attendance History Page
(Source: Research Data, 2026)

This view empowers mentors to evaluate discipline patterns. By visualizing attendance status (Present/Sick/Excused) historically, mentors can make data-driven decisions regarding intern diligence, which is difficult to track manually.

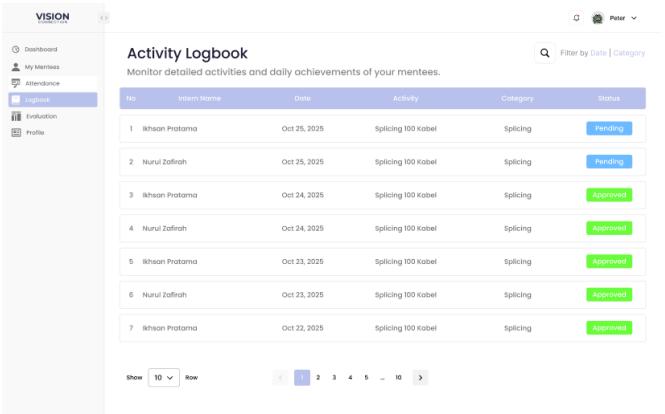

Figure 14. Participant Activity Logbook Page
(Source: Research Data, 2026)

This interface allows mentors to validate daily activities. The digital approval workflow ensures that every activity is reviewed, creating a verified audit trail that paper logbooks lack.

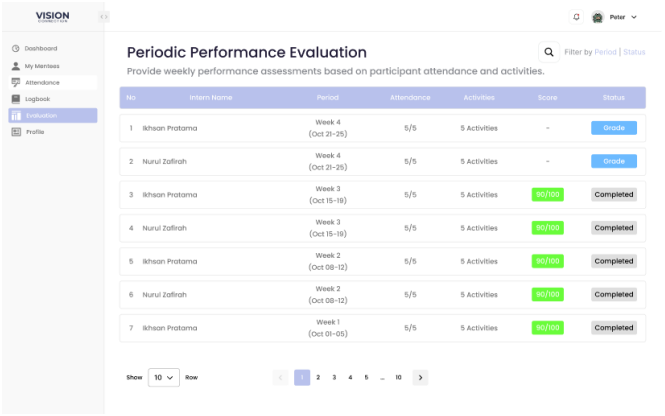

Figure 15. Participant Performance Evaluation Page
(Source: Research Data, 2026)

This page digitizes the performance assessment form. By using fixed dropdowns and score fields, the system enforces an Objective Assessment standard, significantly reducing the subjectivity inherent in free-form manual evaluations.

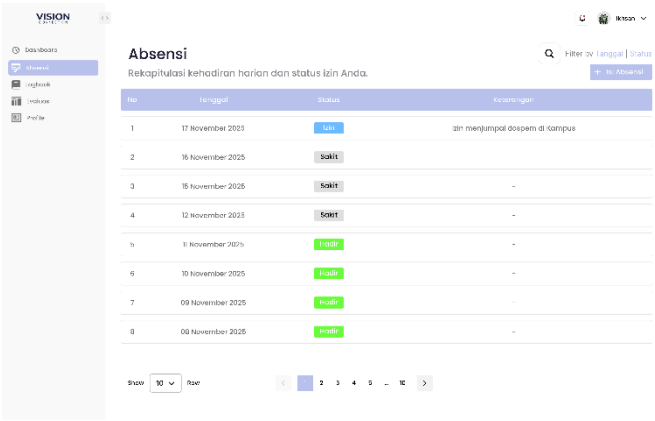

Figure 16. Intern Attendance History Page
(Source: Research Data, 2026)

The transparency feature allows interns to monitor their own attendance record in real-time. This self-service access reduces disputes regarding attendance, a common friction point in internship management.

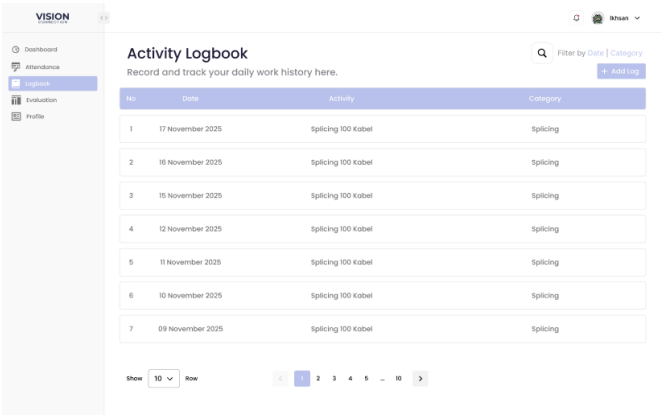

Figure 17. Intern Activity Logbook Page
(Source: Research Data, 2026)

This is the primary data entry point for interns. The structured input fields (Date, Activity, Description) standardize reporting, making it easier for mentors to review compared to unstructured handwritten notes.

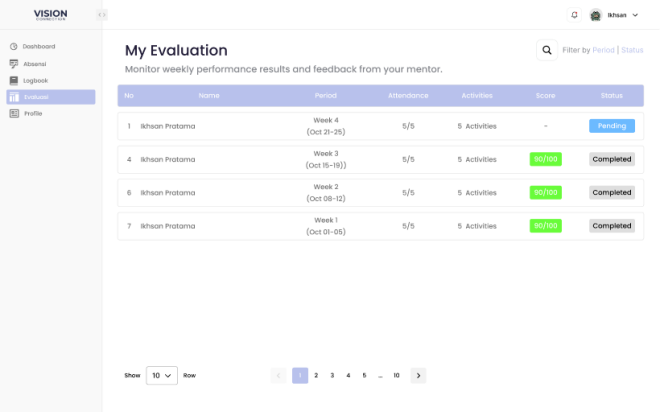

Figure 18. Intern Evaluation Results Page
(Source: Research Data, 2026)

3.4 System Design Testing

To evaluate the effectiveness of the proposed design, a Black Box testing approach was conducted. This test focuses on the functional requirements of the User Interface (UI) to ensure that every necessary interaction point and data display is correctly represented in the high-fidelity design.

Table 1. Black Box Design Testing Results (Source: Research Data, 2026)

No	Tested Design Feature	Test Scenario	Expected Result	Result
1	Login Gateway	Visualizing role selection and credential input fields	UI provides clear entry points for Admin, Mentor, and Intern	Pass
2	Master Data Management	Representing the mentor and participant list tables	UI displays structured data columns with action buttons	Pass
3	Attendance Monitoring	Visualizing the attendance status (Present, Sick, Excused)	UI clearly distinguishes each status through color coding or labels	Pass
4	Logbook Reporting	Representing daily activity input forms	UI includes fields for Date, Activity, and Description for reporting	Pass
5	Approval Workflow	Visualizing the validation action for mentors	UI provides an approval/rejection mechanism for each intern logbook	Pass
6	Performance Assessment	Representing the digitized performance scoring form	UI includes dropdowns or numeric fields for objective assessment	Pass
7	Feedback Loop	Visualizing the final evaluation result for interns	UI displays the final calculated score and performance status	Pass

This final interface completes the feedback loop, displaying the calculated score and status. It ensures that interns receive their final performance metrics instantly after mentor approval, eliminating administrative delays.

The results of the study indicate that the design of an internship monitoring and evaluation system using Unified Modeling Language (UML) modeling and user interface design is capable of addressing the issues of activity recording, attendance monitoring, and performance evaluation of interns in a structured manner. The use of use cases, activities, and sequence diagrams helps clarify system functions, process flows, and interactions between actors.

These findings are in line with the research by Anardani et al. and Ichsandi et al., which states that UML modeling is effective in clarifying system requirements and improving the ease of data management in web-based information systems [18] [19]. This similarity can be seen in the use of UML diagrams as the basis for systematic and easy-to-understand system design.

Unlike the research by Narulita et al. and Hanifa et al., which focused on the system implementation stage, this study focused on the conceptual and visual design stages [20] [21]. The main contribution of this study is to produce a monitoring and evaluation system design for internships that integrates UML modeling and Figma-based user interface design, which can be used as a basis for prototype development and system implementation in further research.

4. CONCLUSION

Based on the results of the analysis and design, it is concluded that the proposed Internship Monitoring and Evaluation System effectively addresses the critical inefficiencies found in manual workflows. Methodologically, this study demonstrates that integrating Role-Based Access Control (RBAC) logic within Unified Modeling Language (UML) diagrams serves as a critical preventive framework to ensure data integrity and atomicity prior to the development

phase. Unlike standard administrative tools, the proposed design contributes to the field of Information System Design by bridging the gap between strict data security (backend logic) and Minimalist User Interface heuristics (frontend usability). The validation through Black Box testing confirms that the conceptual models (Use Case, Activity, and Sequence Diagrams) have been successfully translated into a functional High-Fidelity Design without logical errors. For future research, it is recommended to proceed to the implementation stage using web-based technologies and to conduct empirical validation. Specifically, future studies should employ User Acceptance Testing (UAT) and the System Usability Scale (SUS) to quantitatively measure the system's effectiveness and user satisfaction in a live operational environment.

5. ACKNOWLEDGEMENTS

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