DEVELOPMENT OF FIELD WORK PRACTICE MANAGEMENT IN INFORMATICS INTEGRATED SERVICE SYSTEM

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Abstract—*Field work practice is crucial for aligning college education with workplace skills, but manual management poses challenges such as time-consuming processes and limited information access, particularly within the Informatics Program at Mulawarman University. This research explores integrating field work practice with mobile technology through Rapid Application Development, resulting in a comprehensive field work practice management mobile app. Data collected from direct observation and student questionnaires inform the app's development. The app covers various field work practice aspects, facilitating efficient student engagement, and Black Box testing confirms its functionality without errors. This research significantly contributes to field work practice management, offering stakeholders an efficient, transparent, and well-integrated solution for field work practice implementation in academic settings, ultimately aiming to enhance convenience and accelerate the field work practice process for all involved parties.*

Keywords: *field work practice, application, rapid application development, black box.*

Abstrak— *Praktik kerja lapangan sangat penting untuk menyelaraskan pendidikan perguruan tinggi dengan keterampilan kerja, namun pengelolaan manual menimbulkan tantangan seperti proses yang memakan waktu dan akses informasi yang terbatas, terutama dalam Program Informatika di Universitas Mulawarman. Untuk mengatasi hal ini, penelitian ini mengeksplorasi integrasi praktik kerja lapangan dengan teknologi mobile melalui Rapid Application Development (RAD), yang menghasilkan aplikasi manajemen praktik kerja lapangan yang komprehensif. Data yang dikumpulkan dari observasi langsung dan kuesioner mahasiswa menjadi dasar pengembangan aplikasi tersebut. Aplikasi ini mencakup berbagai aspek praktek kerja lapangan, memfasilitasi keterlibatan mahasiswa dengan efisien, dan pengujian Black Box mengkonfirmasi fungsionalitasnya tanpa kesalahan. Penelitian ini memberikan kontribusi signifikan bagi manajemen praktik kerja lapangan, menawarkan pemangku kepentingan solusi yang efisien, transparan, dan terintegrasi dengan baik untuk implementasi praktik kerja lapangan di lingkungan akademik, dengan tujuan akhir meningkatkan kenyamanan dan percepatan proses praktik kerja lapangan untuk semua pihak yang terlibat.*

Kata Kunci*: praktik kerja lapangan, aplikasi, rapid application development, black box.*

INTRODUCTION

Field work practice serves as a synchronized implementation between college education and the mastery of skills through direct work experience. Aiming to attain specific expertise within a certain period in accordance with the curriculum and the needs of the professional requirement (Aris, Hose Munthe, Ikhwanul Hartanto, & Ahmad Syampurna, 2021).

However, conventional management of field work practice administration is still used in most university, this method often encounters various challenges affecting field work practice services. Previous research has shown that conventional method, involving paper-based administrative file management, proves to be less effective and efficient than its digital counterpart (Nelmiawati, 2023). This approach is still utilized by Mulawarman University, consuming time, prone to errors, and inefficient resource utilization. Moreover, access to field work practice related information also presents a challenge, with students often lacking information regarding field work

practice procedures, location selection, and availability of field work practice supervisors (Amelia & Irmanda, 2021). This information overload can hinder the field work practice process for students.

There are different approaches to creating mobile apps that improve administrative and instructional procedures. One of which is Rapid Application Development (RAD) or Rapid Prototyping. It is a phased software development process model that emphasizes short and quick development time, it was found that the use of RAD shorten the required time and allows for flexibility in changing the regulation in an academy (Murdiani & Sobirin, 2022). However RAD requires a thorough commitment from all stackholder. Without this, the development time could become longer (Prabowo, 2021).

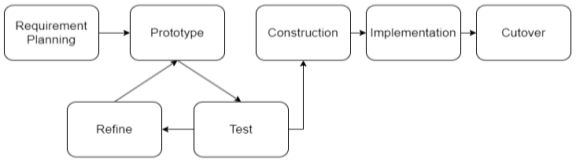
Nonethleless, due to its short development time, there has been many studies that utilized RAD to develop academic management system. For example, the development of an e-learning application enabling rapid transmission of instructional videos and e-books (Fauzi, Ginabila, & Azis, 2023) . In 2022, another researcher also created an internship registration system for ITJEN Kemendikbud (Zulfallah & Hidayatuloh, 2022) . Meanwhile, Choirul Huda, Heriadi, & Widyastuti (2022) employed RAD to develop an Android application managing student and employer data, attendance, and leave requests. These applications demonstrate RAD's effectiveness in achieving rapid development and high-quality outcomes. Nevertheless, there remains a research gap in the integration of these studies to create an all-inclusive mobile platform integrated internship management system. The system ought to proficiently handle data pertaining to internships, optimize the tracking of attendance, and integrate instructional and administrative features to cater to the various demands of the stakeholders involved with internship programs.

Designing field work practice management within the Integrated Informatics Service System (SILA) application offers an effective solution. By developing an integrated management system, users can optimize data management (Muflihin, Dhika, & Handayani, 2020). This system provides an efficient, centralized platform for registration, correspondence, supervisor delegation, assessment of field work practice results, and notifications, streamlining the evaluation process. The use of an integrated system will simplify field work practice processes (Baqi, Choirina, & Jannah, 2022). For students this system will provide easier and quicker access to necessary information. As mentioned in previous research, student finish their field work practice faster by accessing necessary infromation easier (Khinanthi, Sulistyohati, & Mufti, 2023). Supervisors and partners can easily obtain information on student's work for better evaluation and guidance. Staff members will also benefit from features, enhancing service delivery to students more efficiently (Zaidir & Listiawan, 2022).

This research, titled "Development Field Work Practice Management in the Integrated Service System," utilizes the Rapid Application Development (RAD) method. The system will be developed for the Informatics Study Program at the University of Mulawarman to manage field work practice, from applying for field work practice to marking stage. It aims to ensure the SILA application benefits students, the university, and field work practice participants. The integrated information system is expected to make field work practice management more efficient, transparent, and effective in supporting student competency development. However, the study has limitations, including limited functionality, lack of integration with existing university systems, and untested scalability.

MATERIALS AND METHODS

Rapid Application Development (RAD) or Rapid Prototyping is conducted in short iterations, with each stage producing a better version (Prabowo, 2021). The stages of the RAD process include Requirement Planning, where user needs are identified, key features and functions are defined, and resources and schedules are planned. Following Requirement Planning is the Prototype stage, which involves building preliminary system versions for visualization. In the Testing stage, prototypes undergo evaluation for functionality using Black Box Testing to detect errors. Refinement follows, incorporating adjustments based on testing feedback. The Construction stage focuses on rapid development and iterative improvement of the final system. Implementation prepares the system for full-scale operation, and the Cutover stage involves system deployment, transitioning from the old to the new system, including data conversion, user training, and validation. This streamlined process ensures efficient and comprehensive system development, as depicted in Figure 1.



Source : (Prabowo, 2021)

Figure 1. The Stages of RAD

To gather the required data for developing the field work practice management system, this research employs the Rapid Application Development (RAD) model. RAD utilizes iterative methods to create an early working system model, identify user requirements, and fulfill those needs. The stages involved in creating this system are as follows:

Requirements Collection

In gathering the design requirements for a field work practice management system, this research engages users from the Informatics Study Program at Mulawarman University, including staff, lecturers, and students. By identifying existing problems and obstacles, the necessary data and information for designing and building the system can be determined. The data collection methods include:

a. Observation

Observation is the process of directly observing research objects in the field during research, conducting direct observations of the Informatics Study Program, to obtain everything related to field work practice activities and to identify issues occurring within the current system.

b. Questionnaire

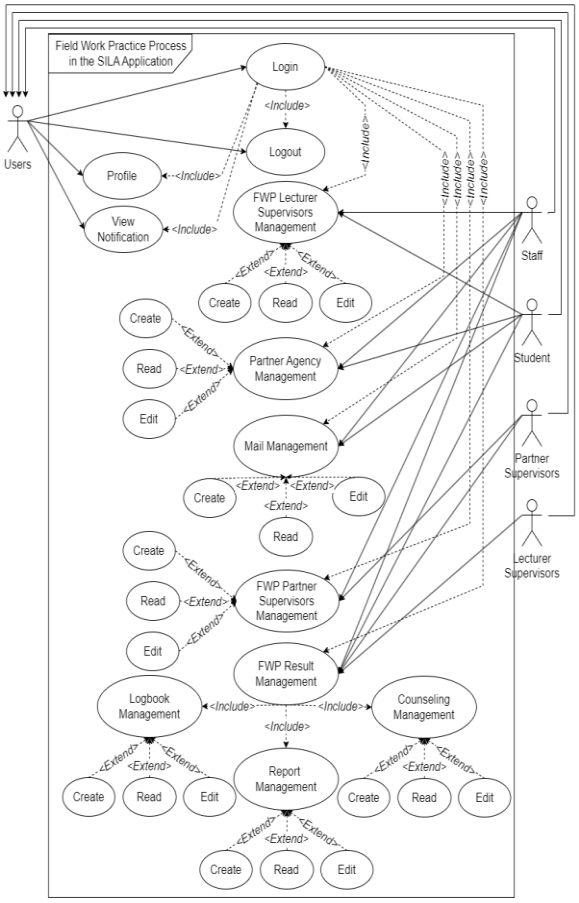
A questionnaire is a form of research method that involves posing several questions to individuals who play a significant role in the research subject.

Design Process

The process design begins by depicting the workflow of the field work practice process that will be developed, aiming to provide an overview of the field work practice management system in the SILA application. This visualization utilizes UML to depict models and software system descriptions (Destriana, Husain, Handayani, & Siswanto, 2021), which include:

a. Use Case Diagram

Use case diagram is used to illustrate the relationship between actors and the system and to depict the interaction between them (Rendi, 2021). The field work practice system involves four main groups: lecturers, students, partners, and staff. Everyone needs to log in to use the system. Staff assign supervisors and can change assignments. Students can find field work locations and request letters through the system. Staff get notifications, review requests, and can approve or reject them with explanations. During field work, students register partners using the SILA app, and staff create partner accounts. Evaluation includes logbooks, notes, reports, and assessments that all users can access. Students can add, view, edit their logs and notes, and submit reports. Supervisors can grade logs and reports, while partners can view logs and evaluate students. Staff members have comprehensive access to all system results, encompassing logbooks, guidance notes, student reports, and assessments, as illustrated in Figure 2.



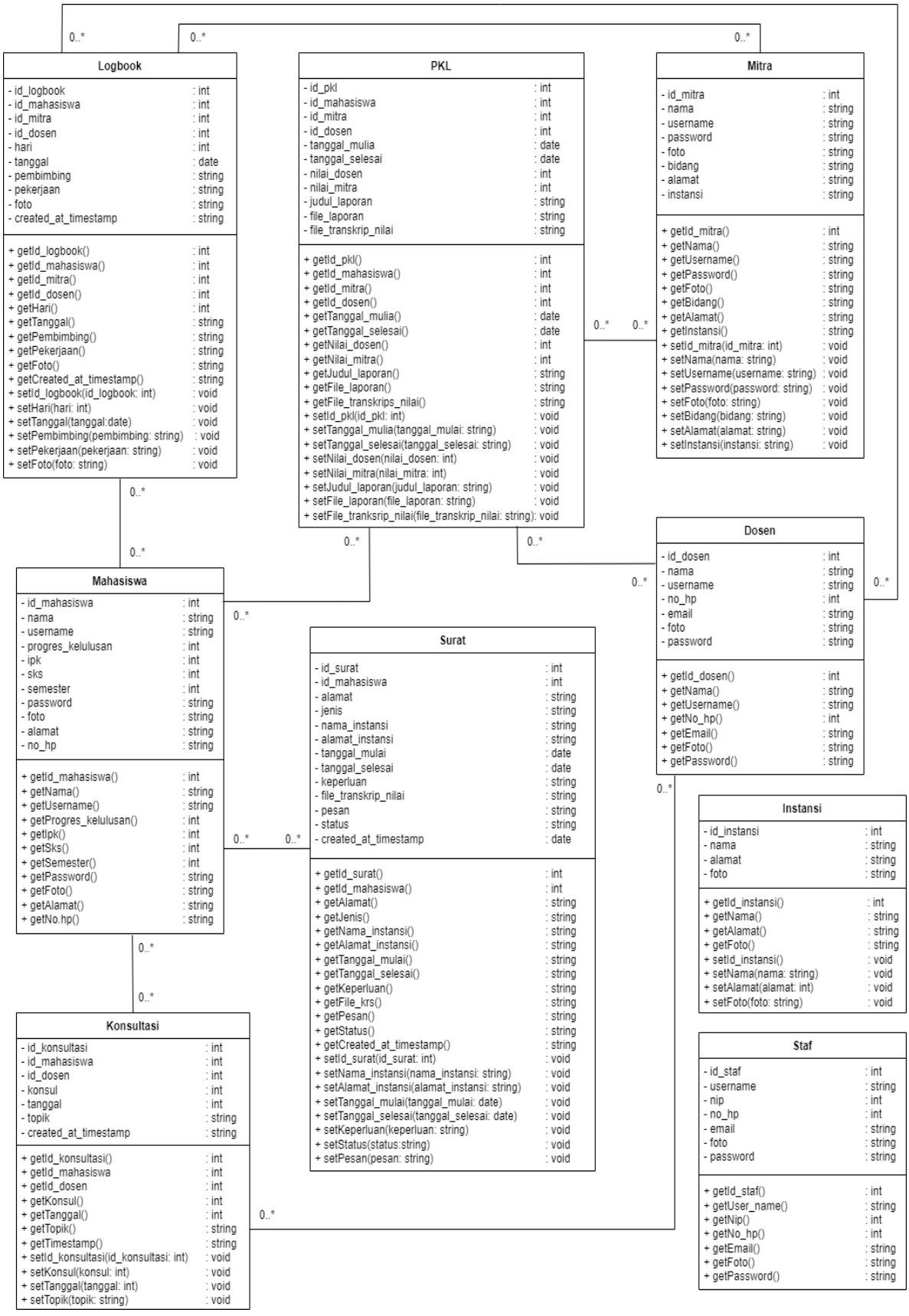
Source : (Research Result, 2024)

Figure 2. Use Case Diagram

b. Class Diagram

The class diagram provides an easily understandable representation of the structure of the existing classes (Setiawan, 2021b). The field work practice management system includes nine classes: student, partner, lecturer, staff, field work practice, logbook, guidance, letter, and institution, each with specific associations. For example, the Student class interacts with the Letter, Field Work Practice, Logbook, and Guidance classes, indicating tasks like requesting letters and submitting logbooks. Similarly, the Partner, Lecturer, and Staff classes interact with the Field Work Practice and Logbook classes, ensuring comprehensive tracking and management of internships. These relationships enable effective and efficient management, from setup and supervision to final evaluation, addressing the needs of all stakeholders. The relationships between the classes are as shown in Figure 3.

PILAR Nusa Mandiri: Journal of Computing and Information System
Vol. 20, No. 2 September 2024 | DOI: 10.33480/pilar.v20i2.5523

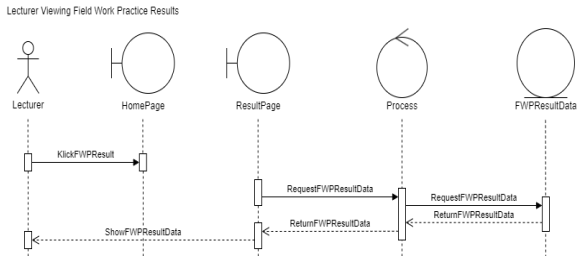


Source : (Research Result, 2024)

Figure 3. Class Diagram

c. Sequence Diagram

The Field work practice management system sequence diagrams provides an overview of how processes occur within the system. Sequence diagram illustrates the systematic process of actors accessing data within the system (Setiawan, 2021a). The system will process and control the storage of the database, which will then display the data for the actors. One examples of sequence diagram of field work practice sequence digaram is as shown in Figure 4.



Source : (Research Result, 2024)

Figure 4. Sequence Diagram

Building Prototypes

At this stage, a mobile based field work practice management system will be created, using the Flutter framework, PHP programming language with Laravel Framework, and MySQL as a database.

Prototype Evaluation

Prototype evaluationis carried out through using Black Box testing is a method of software testing that evaluates the functionality and behavior of software without considering how the software achieves its results in detail (Wicaksono, 2021). This type of testing focuses on how the software interacts with the given inputs and produces the expected outputs, ensuring that its functionality aligns with the specified requirements (Satria, Utama, Rusdianto, & Amalia, 2022).

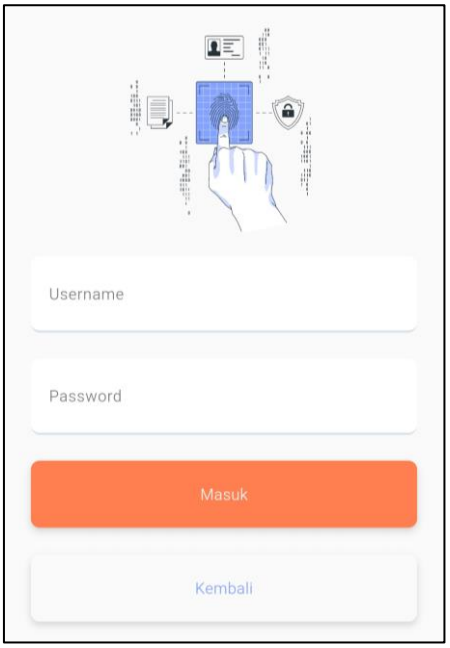
RESULTS AND DISCUSSION

The results of the research on the Design and Development of Field Work Practice Management in the Integrated Informatics Service System using the Rapid Application Development (RAD) method are expected to provide an output in the form of a system that will assist instructors, students, and staff of the Informatics program in facilitating and accelerating the field work practice process.

The result of implementation field work practice management system can be explained as follows:

1. Login Page

The login page contains a form consisting of a username and password field. Users can access the application after filling out the form with the correct data and pressing the login button. As shown in Figure 5.

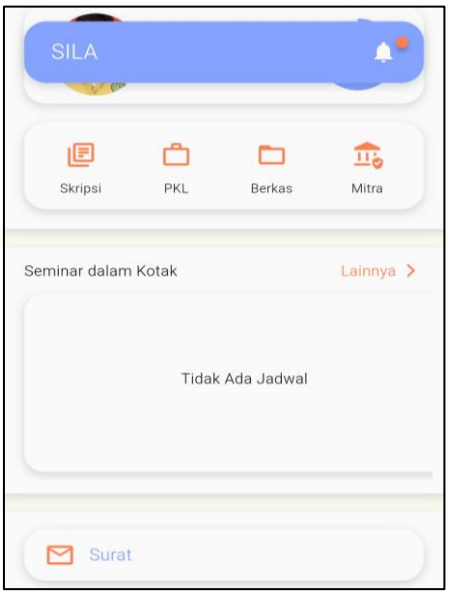


Source : (Research Result, 2024)

Figure 5. Login Page

2. Home Page

The home page contain a menu for users to navigate in the application, users can access type of services such as field work practice management and mail management that available in SILA, as shown in Figure 6.



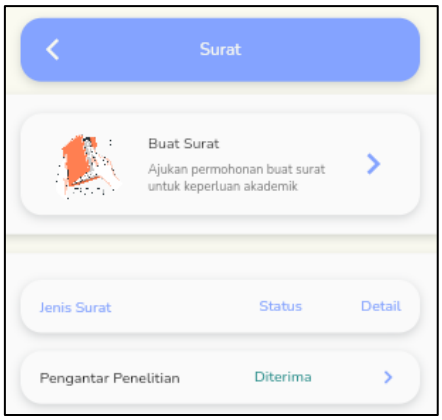
Source : (Research Result, 2024)

Figure 6. Home Page

PILAR Nusa Mandiri: Journal of Computing and Information System
Vol. 20, No. 2 September 2024 | DOI: 10.33480/pilar.v20i2.5523

3. Letters Request Page

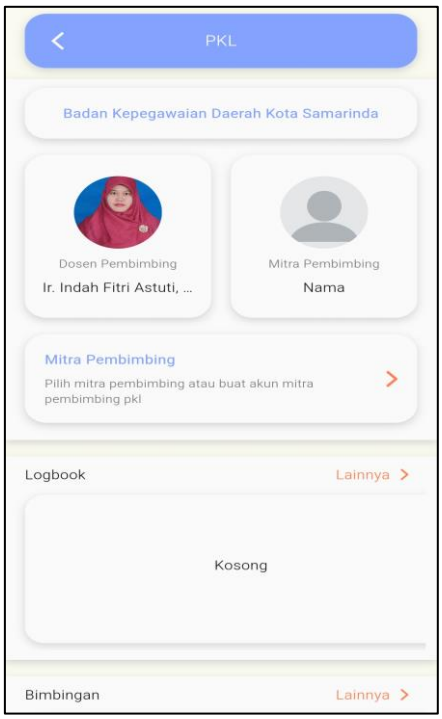
User view request letter page display a list of letter creation requests that have been submitted, providing information such as the type of letter, status, and details button. As shown in Figure 7.



Source : (Research Result, 2024)
Figure 7. Letters Request Page

4. Field Work Practice Page

The field work practice page contains information about the field work practice, such as placement details, supervising instructors, partnering organizations. Additionally, students can fill out logbooks, guidance notes, and submit reports. As shown in Figure 8.



Source : (Research Result, 2024)
Figure 8. Field Work Practice Page

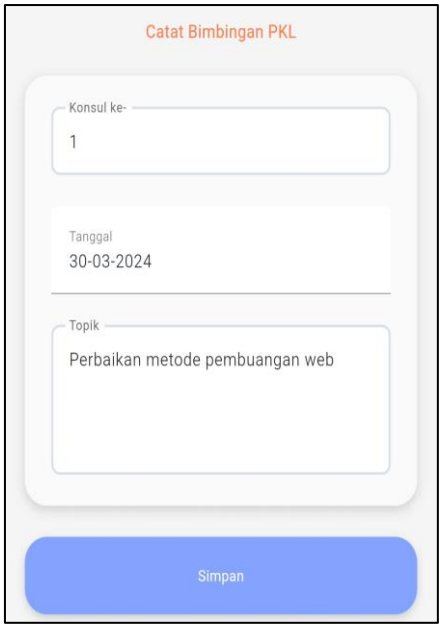
5. Add Logbook

The student's add/edit logbook page is where students can submit their work results during field work practice in the form of a logbook. The form includes fields for the day number, date, supervisor, and job description. As shown in Figure 9.

Source : (Research Result, 2024)
Figure 9. Add Logbook

6. Add Guidance Notes

The student's add/edit guidance page is where students can record the results of guidance sessions with their supervising instructors. The form includes fields for the guidance session number, date, and evaluation topic. As shown in Figure 10.



Source : (Research Result, 2024)
Figure 10. Add Guidance Notes

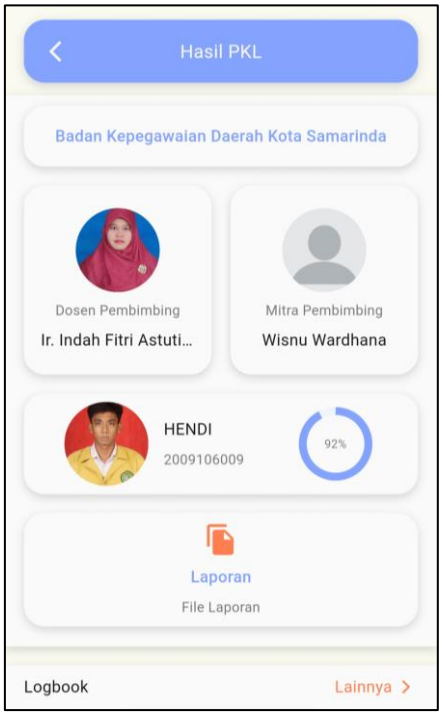
7. Add Final Report

The student's add report page is where students can submit their field work practice report. The form requires uploading a PDF file containing the field work practice report. As shown in figure 11.

Source : (Research Result, 2024)
Figure 11. Final Report

8. Result Page

The field work practice results page is accessible to students, partners, instructors, and staff. This page contains information and outcomes of the student's field work practice, including details about the field work practice placement, supervising instructors, partnering organizations, and the student themselves. Additionally, it displays field work practice results such as logbooks, guidance notes, reports, and field work practice grades. As shown in Figure 12.



Source : (Research Result, 2024)
Figure 12. Result Page

Based on the results of information system testing using the black box testing method, it can be ensured that all 18 processes from login to viewing field work practice (FWP) in the system can run well and smoothly without any errors. The results can be seen in Table 1.

Table 1. Black Box Test Result

No.	Test Cases	Expected results	Test result	Test Result Status
1.	Login with entering the username and password correctly	Enter the main page	*Login* successful and the page moves to the home page	In accordance
2.	Determining supervisorby pressing the icon button to assign the field work practice supervisor	The supervisor has been successfully appointed	Students get a field work practice supervisor	In accordance
3.	Selecting a class of field work practice students to view supervisors	The list of students appears along with the supervisor	System displays list of students along with their supervisor	In accordance
4.	Changes supervisor by selecting new supervisor and press the save button	The supervisor was successfully changed	The stored data was successfully changed and the supervisor changed	In accordance
5.	View FWP agencies partners by pressing the partner menu	A list of agencies appears	System successfully displays the list of agencies	In accordance
6.	Fill in the type of letter, name of the agency, address of the agency, requirements, period and transcript correctly to add letter creation request	The letter creation request was successfully created	System displays the "Letter submitted successfully" dialog and switches pages	In accordance
7.	Viewing letter request that have been submitted	The details of the letter appear and match those submitted	System displays the history of letter creation according to the data	In accordance
8.	Fill in the name of the agencies partner supervisor, mobile number, correctly to	Partner account creation request created successfully	System displays the "Partner successfully submitted"	In accordance

PILAR Nusa Mandiri: Journal of Computing and Information System
Vol. 20, No. 2 September 2024 | DOI: 10.33480/pilar.v20i2.5523

No.	Test Cases	Expected results	Test result	Test Result Status
	send account creation request		dialog and switches pages	
9.	Adding account password with filling password and confirm password are filled in correctly and press the save button	Request to create a mentor partner account has been successfully updated	System displays the "Partner updated successfully" dialog and switches pages	In accordance
10.	Add logbook by filling in the day, date, supervisor's name, and job correctly	*Logbook*created successfully	System successfully saves the data and the dialog "Logbook created successfully" appears.	In accordance
11.	Enter the logbook page to view submitted logbook	The logbook list appears and corresponds to what was created	System displays logbook data as it has been created	In accordance
12.	Change the number of days, dates, names of supervisors, and jobs that have been done	*Logbook* changed successfully	Changed data is successfully saved and the "Logbook updated successfully" dialog appears.	In accordance
13.	Add guidance by filling guidance number, date, and topic are entered correctly	Guidance created successfully	System successfully saves the data and the dialog "Guidance created successfully" appears.	In accordance
14.	Enter the guidance page to view submitted guidance	Guidance list appears and corresponds to what was created	System displays guidance data as it has been created	In accordance
15.	Change the number of tutorials, dates and topics that have been discussed to change guidance data	Guidance changed successfully	The changed data is successfully saved and the "Guidance updated successfully" dialog appears.	In accordance
16.	Upload the report file and press the send report button	Report sent successfully	System successfully saves the data and the dialog " field work practice updated successfully" appears.	In accordance
17.	To view FWP report press the report icon button	The report file appears and corresponds to what was sent	The page moves and displays the report file	In accordance
18.	View FWP result by pressing the field work practice result menu	The value details appear and correspond to the results	The system displays value data that corresponds to result values	In accordance

Source : (Research Result, 2024)

The evaluation of the Field Work Practice (FWP) Management System was conducted with Android mobile platform through a series of predefined test cases to verify its functionality. The system was tested for various features including login, supervisor assignment, viewing supervisors, partner management, logbook entries, guidance records, and report handling. Each test case was executed, and the actual outcomes were compared with the expected results. The login functionality successfully navigated users to the home page upon correct entry of credentials. Supervisor assignments and changes were accurately processed, with the system correctly displaying lists of students and supervisors. The creation and management of partner accounts, as well as the submission and viewing of logbooks and guidance records, were handled efficiently, with the system providing appropriate confirmation dialogs. Report submission and viewing were also validated successfully, ensuring that all FWP-related data was accurately managed and displayed. Each test case was in accordance with the expected outcomes, confirming the system's reliability and effectiveness in managing FWP activities.

Based on the results of the trial implementation of SILA mobile app using the black box testing method, all features have been confirmed to run well as expectation and are free from errors. For further testing the system may be installed by accessing this following link https://sila.ft.unmul.ac.id/.

CONCLUSION

Based on the research conducted on the development of field work practice management in the Integrated Informatics Service System (IISS) using the Rapid Application Development (RAD) method, the aim was to construct and implement a comprehensive system for managing field work practices. The research covered the entire process from staff assigning supervising instructors to the ability of students, partners, and staff to view practice results, including reports, logbooks, guidance notes, and grades. The Black Box testing method confirmed the system's reliability and performance. However, the study has limitations, including a limited scope of functionality, lack of integration with existing university systems, and untested scalability. For future improvements, it is suggested to broaden the system's functionality, integrate it with other academic systems, conduct extensive performance testing, and provide comprehensive user training and support. These enhancements will create a more robust integrated system for managing students's academic processes.

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