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Development of a Web-Based Internship Monitoring Application for Teachers at PT Chlorine Digital Media

Amella Nurul Hasanah, Agus Salim
Manajemen Informatika, Politeknik LP3I
Email: amellanurulhasanah.r22mi@plb.ac.id; agussalim@plb.ac.id.

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Abstract

The advancement of information technology has driven digital transformation across various sectors, including the management of *Praktik Kerja Lapangan* (PKL) programs. PT Chlorine Digital Media faces several administrative challenges, such as manual certificate distribution, delayed feedback, and unintegrated reports. This study aims to develop a web-based application using the Laravel framework due to its advantages in security, scalability, and efficient data management. Meanwhile, the Waterfall method was chosen for its systematic development stages, ensuring that each process aligns with system requirements. The results show that the developed application enhances efficiency and transparency in PKL data management, allowing teachers to access grades and certificates in real-time while expediting report generation. Beyond PKL, this system can be implemented for certification management, training evaluation, and internship monitoring in various institutions to support data-driven digital administration.

Keywords: PKL, Laravel, Digital Certificate, Internship Assessment, Web-Based Information System.

1 INTRODUCTION

The development of information technology today has had an increasingly significant impact across various sectors, including the effective and efficient management of information. Web-based technologies, particularly the Laravel framework, are widely used due to their ability to build secure, scalable, and easily maintainable web applications. PT Chlorine Digital Media leverages this teacher Internship Program (*Praktik Kerja Lapangan/*PKL) under their supervision (Sinlae et al., 2024).

However, PT Chlorine Digital Media faces several key challenges in managing the teacher internship program. Based on observations and firsthand experience during the Industrial Work Practice (Kuliah Kerja Industri/KKI) at the company, it was found that the current PKL data management system is still manual, leading to various operational issues. One of the main problems is the manual distribution of PKL certificates, where each document must be reviewed and sent individually to participants. This causes delays and increases the risk of errors in certificate distribution.

In addition, teachers participating in the internship program have to wait a considerable amount of time to receive their evaluations and feedback, as the assessment process is conducted separately from the main system. These delays hinder teachers from reflecting on and improving their PKL outcomes. The lack of an integrated system connecting activity reports with evaluation data also presents a challenge, as compiling reports takes considerable time due to the need to collect data manually from various sources.

Using the Laravel framework in web application development offers several advantages, including robust security, flexibility in data management, and ease of adding modules as needed. By utilizing this technology, an application can be designed to address the issue of certificate distribution

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by providing a fast and accurate manual upload feature. Additionally, an interactive dashboard can assist teachers in monitoring their evaluations and accessing grades and feedback directly. The report generation process can also be integrated with other data, thus streamlining and simplifying report management. Research by (Walukow et al., 2023) indicates that the implementation of information technology in administration can increase data management efficiency, minimize human error, and accelerate information distribution.

Furthermore, (Toni & Hadi, 2023) emphasize that Laravel provides significant advantages in academic system development, particularly in terms of security and ease of database management. In the context of teacher internship management, the use of Laravel has also been proven to improve the effectiveness of PKL participant management systems, as discussed by (Rosadi et al., 2020), who developed a Laravel-based system to facilitate the registration, monitoring, and evaluation of internship participants in a more structured and automated manner. Additionally, research by (Shalihin et al., 2022) shows that implementing Laravel in internship systems can optimize certificate document storage and management, thereby reducing errors in manual document distribution.

This study aims to develop a more structured and efficient teacher internship management system by utilizing the Laravel framework. With this system, it is expected that the management of reports, certificates, and assessments can be carried out more automatically and with minimal errors. Moreover, this research contributes by providing a technology-based solution that enhances the administrative effectiveness of internship programs, while also offering easy access for teachers and administrators in managing internship data digitally.

The novelty of this research lies in the implementation of automated certificate and assessment management features using Laravel, which have not been widely adopted in similar systems. Unlike previous studies that focused more on internship registration and monitoring, this research integrates digital certification and data-driven evaluation features that can be accessed in real-time by teachers and administrators. Through this approach, the system not only enhances administrative efficiency but also enriches the monitoring and reporting functions in a more comprehensivemanner.

The application is expected to improve the efficiency and effectiveness of teacher internship data management while providing an integrated solution for various administrative needs. With a more modern and structured system, the internship program management can be carried out more effectively, meet user needs, and support data-driven decision-making.

2 LITERATURE REVIEW

This section reviews the theories and concepts underlying the research on the development of a web-based information system to manage internship certificates, assessments, and report generation. The literature review includes discussions on web-based information systems, the application of the Laravel framework, the digitalization of internship certificates, transparency in internship assessments, and the integration of internship reports with participant data.

2.1 Web-Based Information Systems

A web-based information system is designed to manage and present data over the internet, allowing users to access information anytime and anywhere with an internet connection. According to (Fitriani et al., 2024)**,** the implementation of a web-based academic information system using the Rapid Application Development (RAD) method can improve the efficiency and effectiveness of academic data management.

In addition, web-based systems offer more flexibility compared to desktop-based systems because they do not require additional software installation and can be accessed from various devices.

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2.2 Laravel Framework in Web System Development

Laravel is one of the most widely used PHP frameworks in web application development. It offers various features that facilitate developers in building applications, such as a routing system, Eloquent ORM, and enhanced security. According to (Mustamiin et al., 2020), Laravel Laravel enables faster application development due to its Model-View-Controller (MVC) architecture, which separates business logic from the presentation layer, making system maintenance and development more manageable. Their study showed that Laravel is highly effective in building web-based exam management systems due to its features that support efficient data management.

2.3 Digitalization of Internship Certificates

The digitalization of internship certificates aims to replace the manual printing process with digital certificates that can be accessed and verified online. In their study, (Palingga Ninditama et al., 2022) stated that digitalization in academic administration, including internship certificates, provides advantages in terms of faster data management and reduces the risk of document loss. With a web-based system, internship participants can download their certificates upon program completion without needing to visit the institution in person.

2.4 Transparency in Internship Assessment

Transparency in internship assessment is an important factor in increasing participants' trust in the evaluation system. A transparent system allows participants to view their assessment results in real time and understand the evaluation criteria used. (Isrohatul Ghoniyah & Handayanto, 2024), in their research, developed a web-based information system that enhances transparency in internship assessment, allowing participants to monitor their grades in real time and providing access to the evaluation criteria used by supervisors. This system also reduces uncertainty in the assessment process, ensuring that participants understand each step taken in evaluating their performance.

2.5 Integration of Internship Report with Participant Data

The integration of internship reports with participant data aims to streamline documentation processes and ensure that all participant information is centralized in one system. (Palingga Ninditama et al., 2022), explained in their study that web-based academic systems can be used to automate internship reports by linking them directly to participant data, thereby simplifying tracking and evaluating participant performance. As a result, manual data entry can be avoided, reducing the risk of administrative errors.

3 RESEARCH METHODS

3.1 Data Collection Method

This research uses interviews as the primary method of data collection. Interviews were conducted with relevant parties at PT Chlorine Digital Media, such as the Director and IT staff who also acted as mentors during the internship. The purpose of the interviews was to understand the problems and needs within the existing system, including certificate management, grading, and report generation. The interview method was chosen because it provides direct information from individuals with in-depth knowledge of the system. As explained in the research methods module of Esa Unggul University, qualitative research interviews involve two-way communication aimed at obtaining the most accurate data possible (Adhandayani, 2020).

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3.2 System Development Method

The system development method used in this project is the Waterfall model. This method was selected due to its structured and systematic workflow, which is suitable for developing the internship management application. The development process begins with requirement analysis, followed by system design, implementation, testing, and concludes with maintenance. This approach ensures that each stage is completed thoroughly before moving on to the next.

The stages of the Waterfall method applied in the development of the internship application are as follows:

1. **Requirement Analysis**
   Developers collect user requirements through discussions, observations, surveys, or interviews, and then analyze them to determine the software specifications. In this stage, interviews were conducted with relevant parties such as academic supervisors and PKL participants to identify challenges in the PKL management process. The collected data were analyzed to formulate system specifications aimed at streamlining PKL document management, including features for certificate uploads, grade access, and automated PKL report generation.
2. **System and Software Design**
   The requirement specifications are analyzed to design the system, including hardware preparation and the overall software architecture. Based on the defined specifications, system design includes user interface layout and software architecture. This stage also involves selecting the technologies to be used, such as frameworks and databases, and structuring the system to ensure usability and performance efficiency.
3. **Implementation and Unit Testing**
   The software is developed in small modules, each tested for functionality and verified against the desired criteria. The system is developed incrementally by building functional modules such as certificate upload features, grade validation, and automated report generation. Each module is individually tested to ensure it performs according to the predefined specifications.
4. **Integration and System Testing**
   The individually tested modules are integrated into a complete system, followed by comprehensive testing to identify any system errors or failures. After separate module testing, the next step is to combine all components into a single cohesive system. System testing is carried out to ensure there are no errors or conflicts between modules and to verify that the application functions as intended by the users.
5. **Operation and Maintenance**
   The software is deployed and maintained, including bug fixes, system improvements, and adjustments based on user needs. After the application is used by users, regular maintenance is performed to fix any bugs found, enhance system performance, and adjust features according to the latest requirements (adminlp2m, 2022).

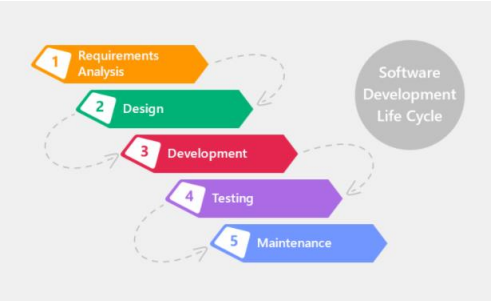

Figure 1. Waterfall Method

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4 RESULTS AND DISCUSSION

4.1 System Design

The system design of this application adopts a visual modeling approach using Use Case Diagrams and Activity Diagrams. Use Case Diagrams are used to illustrate the interaction between users and the system, as well as the main functions that users can perform in the application.

In the development of this application, Figure 2 below presents the Use Case Diagram, which shows the interaction between users and the system and the main features available in the application. This diagram illustrates how teachers and admins play a role in managing various features provided.

Teacher have access to register, manage their profiles, upload PKL reports, participate in competency tests, download certificates, and view evaluation results. Meanwhile, admins are responsible for managing user data, reviewing and grading PKL reports, providing competency test evaluations, and uploading certificates to the system.

With the Use Case Diagram, the development of the application can be more structured as the system requirements are clearly defined. This diagram ensures that each developed feature aligns with the user roles and supports building an effective workflow in the application.

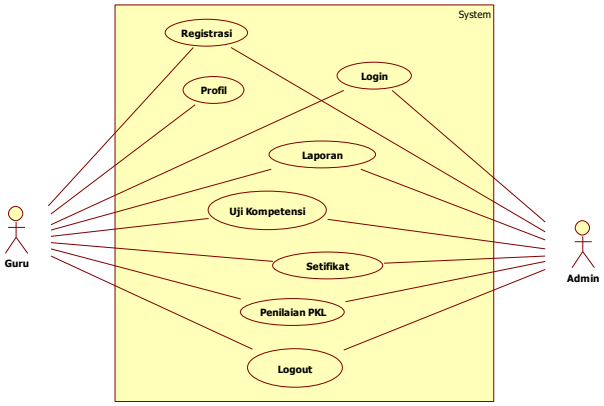

Figure 2. Use Case Diagram

Meanwhile, the Activity Diagram is used to illustrate the flow of activities and processes within the system, providing a deeper understanding of user-system interaction during each operational phase of the application.

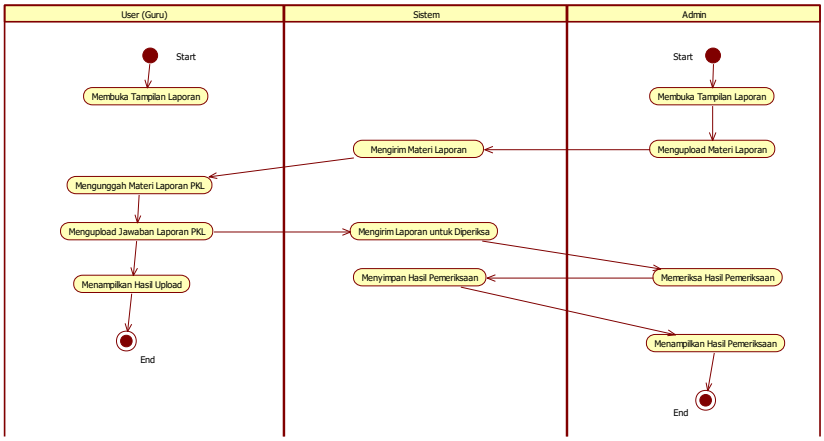

Figure 3. Activity Diagram – Report

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Figure 3 shows the Activity Diagram for the Report feature, where teachers can upload PKL reports, which are then reviewed by the admin before being saved and displayed back to the teacher.

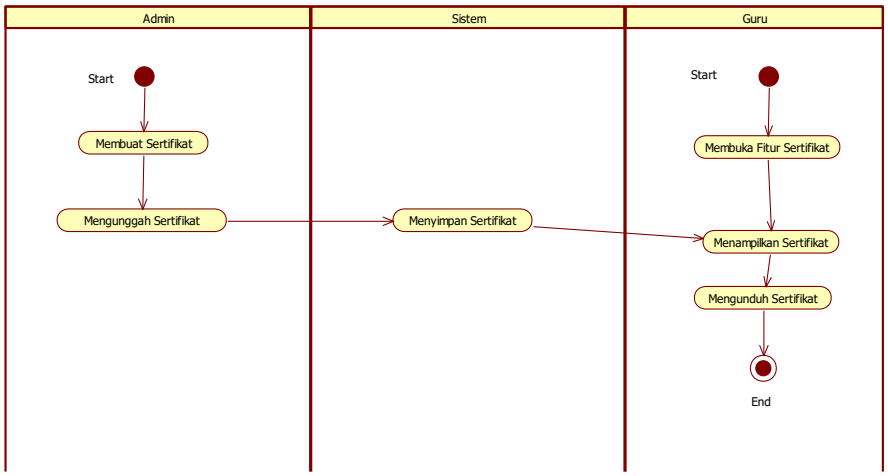

Figure 4. Activity Diagram – Certificate

Figure 4 illustrates the Activity Diagram for the Certificate feature, where the admin creates and uploads certificates, which can then be viewed and downloaded by the teacher.

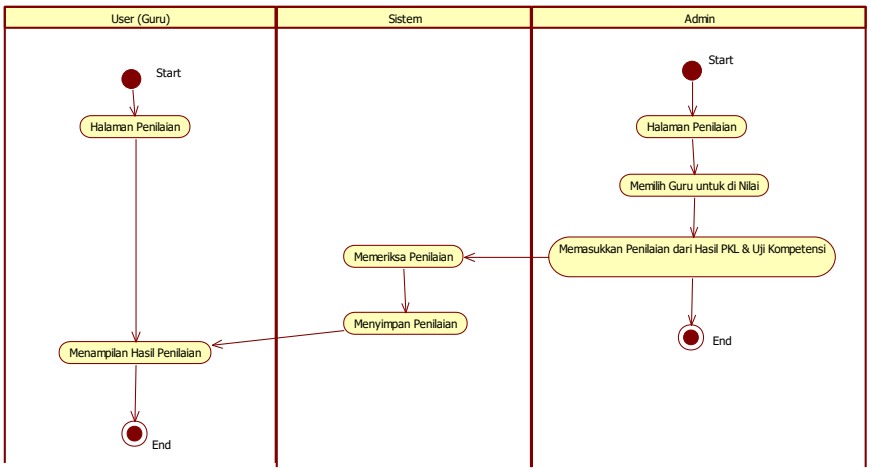

Figure 5. Activity Diagram – Assessment

Figure 5 explains the Activity Diagram for the Assessment feature, where the admin provides scores based on PKL and competency test results, and the system stores and displays the results to the teacher.

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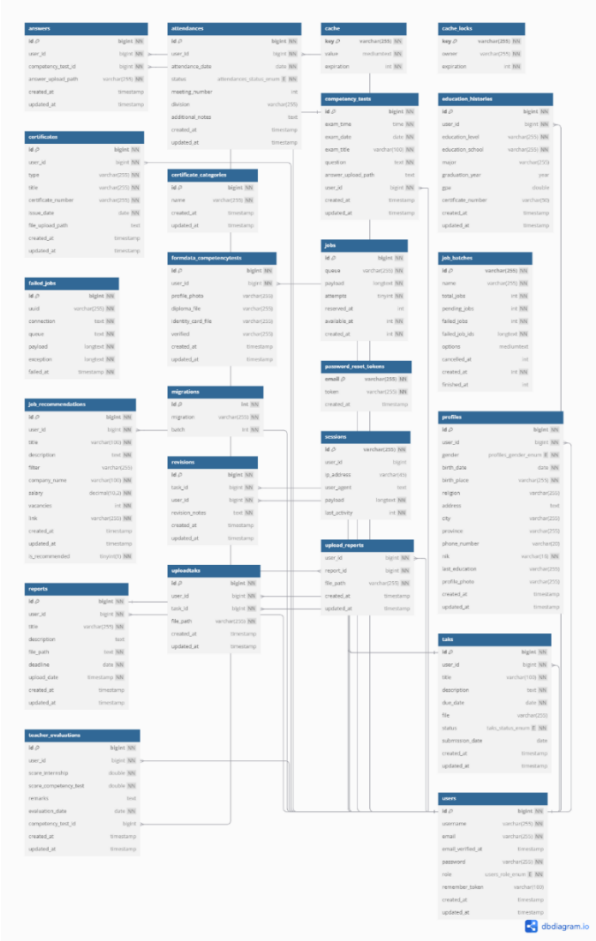

Figure 6. PKL Database

Meanwhile, Figure 6 displays the database structure used in the application development. This structure is designed to manage data efficiently, ensure integration across existing features, and support the application's operations optimally. Table relationships connect users, PKL reports, competency tests, certificates, and assessments, ensuring the system operates effectively for data storage and management.

In this application, the database is not separated between student and teacher PKL, resulting in a relatively large number of managed tables. This merging is done to ease information access within a single system without the need for database integration. However, it makes the database structure more complex because it must accommodate different requirements, data, features, and access rights for both students and teachers.

4.2 System Implementation

System implementation is heavily influenced by a carefully designed user interface, as this plays an important role in user experience and satisfaction. At this stage, the author used the Laravel framework for code development, offering convenience in building a responsive and intuitive interface. With Laravel, the application development process becomes more efficient. Below are the website interface views for the PKL web-based application for teachers developed at PT Chlorine Digital Media, showing how the system is structured and integrated.

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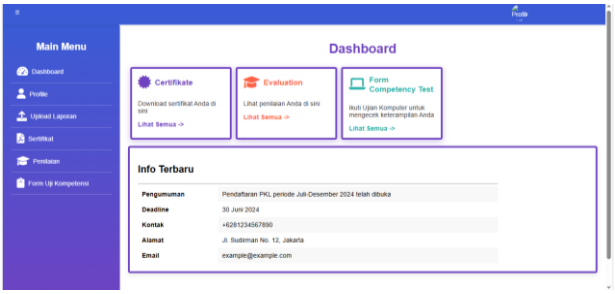

Figure 7. Dashboard Page

This is the main page after the user logs in. On the dashboard, PKL teachers and admins can view summary information related to the PKL program, such as report lists, certificate status, and assessment.

Figure 8. Report Page (Admin)

This page is used by admins to manage PKL reports. Admins can view the list of reports to be completed by PKL teachers, edit reports, and delete unnecessary ones.

Figure 9. Add Report Form Page (Admin)

This page is used by admins to add new reports for PKL teachers to complete. Admins can input the title, description, and upload report files to be sent to the teacher.

Figure 10. Report Page

This page displays a list of reports that PKL teachers need to complete. Teachers can view the report status and select a report to work on.

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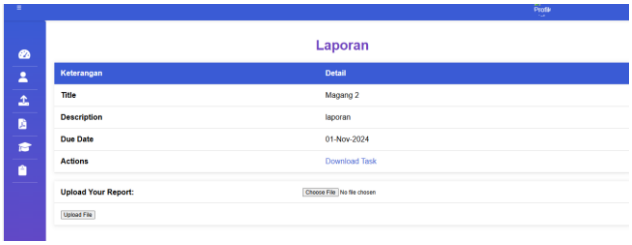

Figure 11. Report Details Page

After selecting a report, the teacher is directed to this page to view report details and upload the answers according to the instructions provided.

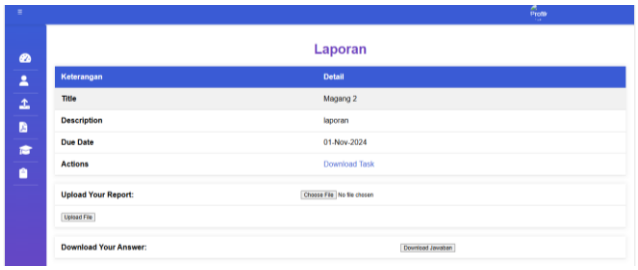

Figure 12. Report Upload Confirmation Page

This page confirms that the report has been successfully uploaded by the PKL teacher. The admin can now review the submitted report.

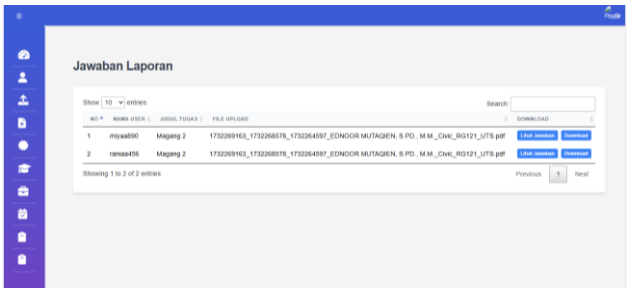

Figure 13. Report Answer Page (Admin)

This page is used by the admin to view report answers submitted by PKL teachers. The admin can give feedback or revise the submitted answers.

Figure 14. Certificate Page (Admin)

This page contains a list of certificates available for PKL teachers. Admins can view, manage, and add new certificates.

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Figure 15. Add Certificate Form Page (Admin)

This page is used to add new certificates based on type or category. Admins manually upload certificates so they can be accessed by PKL teacher.

Figure 16. Certificate Page

This page shows the certificates available for download by PKL teachers. Certificates are categorized according to the type specified by the admin.

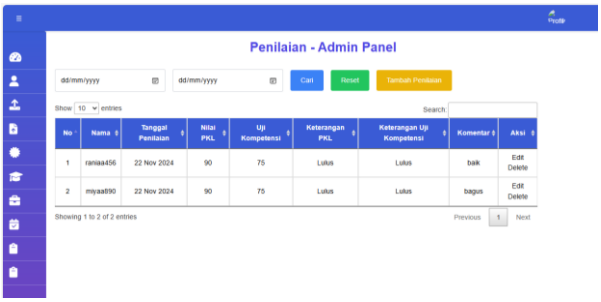

Figure 17. Assessment Page (Admin)

This page is used by the admin to view and manage evaluations for PKL teachers. Admins can assign scores, edit, or delete assessments if necessary.

Figure 18. Add Assessment Form Page (Admin)

This page allows admins to add assessments for PKL teachers. Admins can input scores, notes, and save the results.

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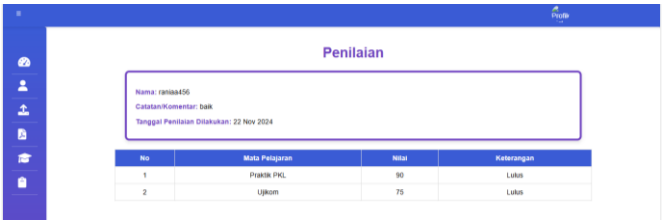

Figure 19. Assessment Page

This page displays the assessment results for PKL teachers during the PKL and Competency Test activities. It contains information about passing status as well as feedback or suggestions provided to the teacher.

4.3 System Testing

Table 1. System Testing – Teacher

No.	Feature	Purpose	Test Steps	Expected Result
1	Login	Ensure successful login	Enter correct email & password, login	User logs in and is redirected to dashboard
2	Login	Ensure failed login	Enter incorrect email or password	Error message appears
3	Register	Ensure account registration	Enter valid data and register	Registration successful, redirected to dashboard
4	Register	Ensure failed registration	Enter invalid data	Error message appears
5	Report	Ensure teachers can download/upload reports	Teacher downloads report, uploads answer, saves	Report downloaded and answer saved
6	Certificate	Ensure certificate is saved and accessible	Upload certificate, save, view result	Certificate saved and accessible
7	Assessment	Ensure teacher can view assessment	Teacher opens graded PKL assessment	Teacher can view assigned grade

Table 1 presents the teacher system testing results, showing that most key features function as expected. However, some shortcomings were identified, such as the lack of a password reset option on the login page and unclear error messages during registration.

Table 2. Teacher System Test Results

No.	Feature	Test Result	User Feedback	Suggested Improvements
1	Login	Works, but no "Forgot Password" option	Users want easier account recovery	Add password reset via email
2	Register	Works with valid data, but error messages are vague	Users want clearer errors, e.g. for duplicate email or weak passwords	Improve clarity of error messages

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No.	Feature	Test Result	User Feedback	Suggested Improvements
3	Report	Teachers can upload, but unsupported file formats not specified	Upload issues due to unsupported formats	Add allowed file format info and auto-conversion
4	Certificate	Upload/view works, but lacks upload confirmation	Users want confirmation of successful upload	Add success notification after upload
5	Assessment	Teachers can view scores but not notified of updates	Users unaware of updated scores	Add notifications or highlights for score changes

Table 2 summarizes teacher feedback on the system. Login works, but users request a "Forgot Password" option. Registration is successful, but error feedback needs improvement. Reports and certificates function correctly, though users face file format issues and lack upload confirmations. Assessments are accessible, but users aren't informed of updates. Proposed solutions include notifications and clearer file format guidance.

Table 3. System Testing – Admin

No.	Feature	Purpose	Test Steps	Expected Result
1	Login	Ensure successful login	Enter correct email & password	Admin logs in and accesses dashboard
2	Upload Report	Ensure report is saved	Select report, upload file, save	Report saved successfully
3	Certificate Form	Ensure certificate is saved	Open form, select file, save	Certificate saved successfully
4	Assessment	Ensure admin can manage grading	Select report, enter score, save	Score saved and editable

Table 3 shows the admin system testing results. Login and uploads are generally successful, although large files sometimes fail without error notifications. Certificates are managed well, but searching for specific files is difficult. The assessment feature functions but lacks data export options.

Table 4. Admin System Test Results

No.	Feature	Test Result	User Feedback	Suggested Improvements
1	Login	Works well.	No significant issues	No changes needed
2	Upload Report	Works, but large files fail silently	Need file size indicators	Add file size limits and auto-compression
3	Certificate Form	Saved, but hard to locate specific entries	Hard to search certificates	Add search and filter options by teacher name/date
4	Assessment	Successfully provided and updated grades, but there is no option to export grade data in Excel or PDF format.	Admin wants printable/downloadable data	Add a feature to export grades to Excel/PDF format for documentation purposes.

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Table 4 summarizes the admin's feedback on the system. The main issues include file size limitations when uploading reports, difficulty in searching for certificates, and the absence of a grade export feature. The proposed solutions include adding a file size indicator, implementing a search feature, and providing an option to export grades to Excel/PDF format.

Table 5. Development Challenges and Solutions

No.	Category	Challenge	Solution
1	Data Validation	Need stricter input validation	Implement frontend/backend validation
2	Notifications and Feedback	Users unaware of changes	Add notifications/confirmation after actions
3	File Management	Upload file size limits .	Use compression or integrate cloud storage
4	Accessibility and Navigation	Admins struggle finding files	Add search and filter functions

Table 5 lists key development challenges including data validation, feedback, file management, and navigation. Suggested solutions involve strengthening input validation, adding alerts, optimizing file handling, and improving searchability.

5 CONCLUSION

The development of the web-based *Praktek Kerja Lapangan* (PKL) monitoring application at PT Chlorine Digital Media has successfully provided a solution to administrative issues that were previously handled manually. By utilizing the Laravel framework, this application enables efficient management of digital certificates, transparent grading, and integration of PKL reports with participant data. The system implementation simplifies access to PKL information for teachers, allows them to receive real-time feedback, and download certificates without the need for time-consuming manual administrative processes.

Test results show that the system functions well and offers significant benefits in improving the effectiveness and efficiency of PKL management. Moving forward, further development can be carried out by adding automation features in the grading process and integrating the system with other educational platforms.

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