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Design and Construction of a Web-Based Employee E-Recruitment Information System at PT. Digdaya Solusi Teknologi Jakarta

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Abstract

In the era of digital transformation, an automated manpower procurement system is a crucial factor in strengthening the operational structure of technology companies. PT. Digdaya Solusi Teknologi (DST) Jakarta currently faces administrative obstacles due to recruitment procedures that are still conventional and paper-based. This condition triggers the risk of physical archive accumulation, slow coordination of selection status, and vulnerability to applicant data damage. This research aims to automate the flow from registration to selection management through the design and development of a web-based E-Recruitment information system. The software development methodology used is the Waterfall model. The research stages include requirements analysis, visual modeling using Unified Modeling Language (UML), program code implementation, and system testing. Data collection was carried out through in-depth interview techniques, HRD workflow observations, and documentation studies. The research results show that this digital platform is capable of significantly accelerating the employee procurement process and providing an organized talent database. Functionality testing using Blackbox Testing proves the system is feasible for use, while evaluation through the System Usability Scale (SUS) confirms an increase in satisfaction and ease of interaction for both admins and prospective applicants.

Keywords: *E-Recruitment, System Design, Waterfall, Website*

1. Introduction

In today's modern era, along with increasingly sophisticated technological advances, all matters related to information management require speed, precision, and accuracy. Technological advancements have resulted in a shift in operational paradigms, where almost all sectors require information systems to manage data efficiently. Information systems are a crucial foundation for effective data management to support decision-making and control within an organization, thereby improving efficiency, accuracy, and company competitiveness. On a corporate scale, one of the vital departments that most requires good information management support is the Human Resources Department (HRD). This department functions as a control center in recruiting quality human resources (HR) to maximize company productivity[1]. Recruitment administration services for a company begin with collecting applicant data, selecting files, and determining graduation status. Therefore, these stages must be carried out quickly, transparently, and objectively. To support this process systematically, software development can be carried out using the Waterfall model. Waterfall is a System Development Life Cycle (SDLC) method that uses a systematic and sequential approach, where the development stages include requirements analysis, design, implementation (coding), testing, and maintenance. This approach ensures that the designed features are fully validated and meet the company's needs before the system is fully operational[2]. PT. Digdaya Solusi Teknologi is a continuously growing organization and is required to have modern technology-based operational services. However, the reality on the ground shows that recruitment procedures at PT. Digdaya Solusi Teknologi are still carried out conventionally and heavily rely on paper-based physical documents. This is because applicant data processing is still done manually, which results in slow selection status coordination processes and is vulnerable to the risk of damage or loss of crucial data such as applicants' Curriculum Vitae (CV). As a result, the HRD team requires a long time to sort candidates, and applicants often have difficulty monitoring the progress of their applications due to a lack of information transparency and the absence of an integrated communication platform[3]. Facing the complexity of the selection process, the system also requires a decision support algorithm to avoid subjective assessments. The application of the Simple Additive Weighting (SAW) method has proven effective in ranking candidates objectively based on certain predetermined weighting criteria, such as education level, work experience, and skills. Therefore, researchers will develop a website-based e-recruitment information system that integrates the SAW method and real-time chat services. This digital information system is expected to help PT. Digdaya Solusi Teknologi transform its manual procedures, overcome the problem of file accumulation, accelerate HR workflows, and ensure data security and objectivity during the selection process[4].

2. Theoretical Basis.

2.1. Understanding Development

The development process focuses on accelerating fundamental capabilities and optimizing valid science and technology functions to ensure the safe fulfillment of operational targets [5].

2.2. Understanding Waterfall Method

Waterfall is a work stage whose aim is to produce a high-quality system according to the customer's wishes or the purpose for which the system was created [6].

2.3. Understanding Information System

An information system is defined as a combination of information technology and the activities of people who use this technology to support operational and management activities within an organization [7].

2.4. Understanding Employee E-Recruitment

E-recruitment is an integrated digital platform that utilizes a centralized database and an automated notification system to automate conventional workforce procurement procedures [8].

3. Research Methods

3.1. Data Sources

1. Primary data is data obtained directly by the author in the field. This data comes from direct observations of ongoing recruitment procedures and in-depth interviews with informants, namely Ms. Ines Monica as HRD and Mr. Teddy Irawan as IT Team Leader at PT. Digdaya Solusi Teknologi Jakarta.
2. Secondary data is data obtained indirectly by the author through existing supporting sources. This data was obtained through a literature review of various scientific literature, software engineering books, related research journals, and internal company document archives regarding workforce procurement policies at PT. Digdaya Solusi Teknologi Jakarta.

3.2. Data Collection Techniques

1. Observation

The observation method in this research is carried out by directly observing the ongoing employee recruitment procedures at PT. Digdaya Solusi Teknologi to identify operational constraints, such as the accumulation of physical documents and the slow distribution of information.

2. Interview

Conducting direct Q&A sessions through in-depth interviews with Mrs. Ines Monica as the HRD and Mr. Teddy Irawan as the IT Team Lead at PT. Digdaya Solusi Teknologi.

3. Literature review

This method is carried out by collecting data, information, and studying scientific literature, software engineering books, as well as the internal company archives regarding manpower procurement policies at PT. Digdaya Solusi Teknologi.

4. System Design

Entity Relationship Diagram

This provides a relationship between the jobs, messages, users, user_token, and applications tables.

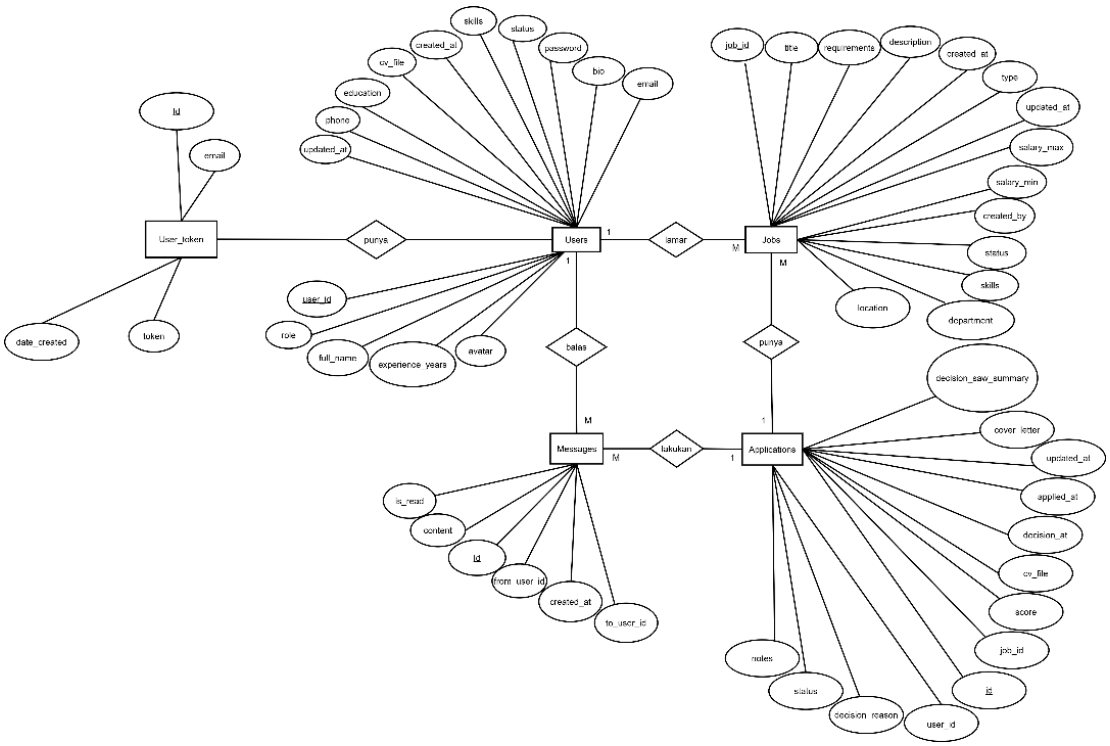

Fig. 1: Entity Relationship Diagram

This ERD depicts the logical data structure and functional relationships between entities that support the operation of the e-recruitment system. This structure facilitates the roles of the three main actors (User/Applicant, Admin, and HR) and supports various modules such as registration, vacancy management, candidate selection, and real-time communication.

Logical Record Structure

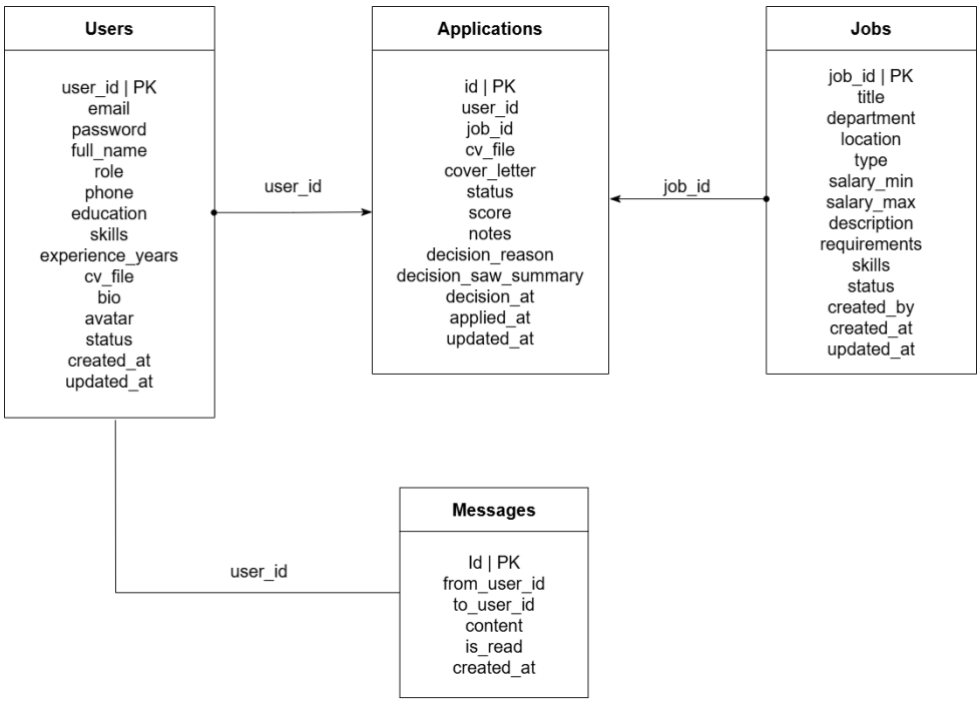

Fig. 2: Logical Record Structure

This LRS maps the results of the transformation of relationships between entities into data tables that are interconnected through foreign keys. This logical record structure facilitates the interaction functionality of the three main actors (User/Applicant, Admin, and HRD) in the system.

Class Diagram

The following figure shows a class diagram.

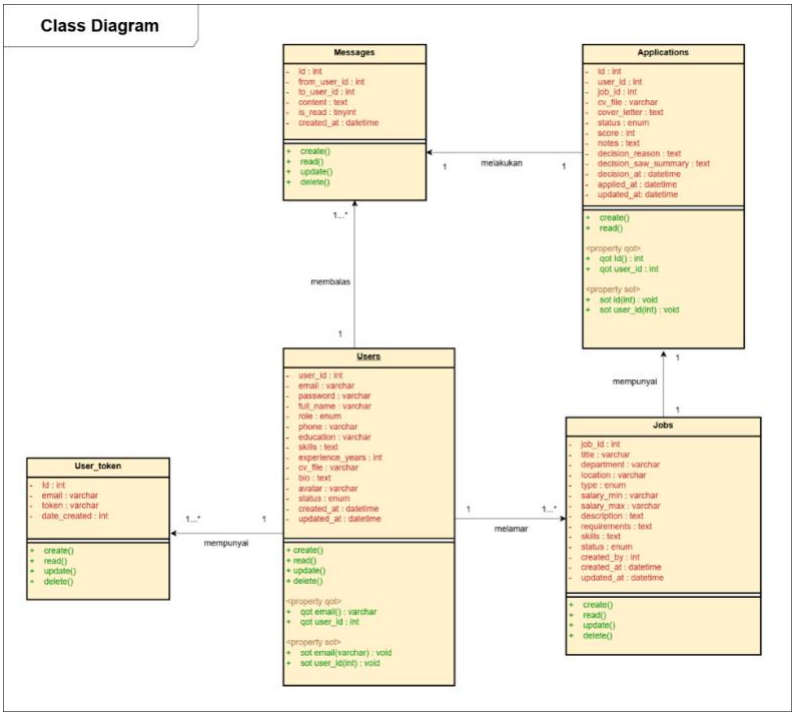

Fig. 3: Class Diagram

This class diagram statically depicts the system structure by showing object classes, attributes, methods (operations), and association relationships between classes. This architecture serves as the foundation for the interactions between the three main actors (User/Applicant, Admin, and HRD) and the operation of the system's modules.

Use Case Diagram

This diagram provides an overview of the communication between external actors and the system to achieve the desired functional goals.

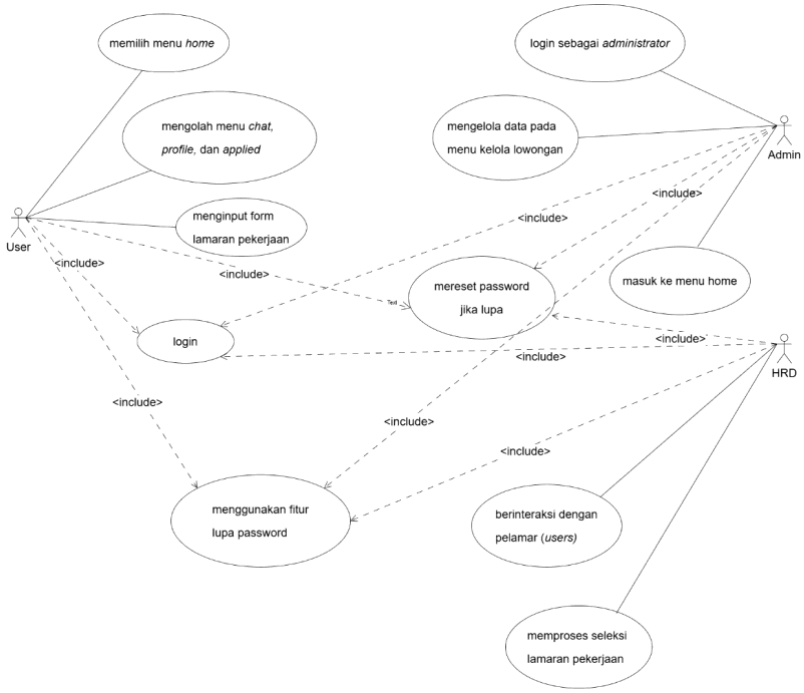

Fig. 4: Use Case Diagram

This figure illustrates the structure and functional interactions between actors and the e-recruitment information system at PT. Digdaya Solusi Teknologi. There are three main actors interacting within the system: User (Applicant), Admin, and HRD. The user actor acts as a job-seeking candidate connected to the registration, login, job search, application file upload, profile management, and history monitoring modules on the applied page. The admin actor functions as an operational data control center with data manipulation capabilities (adding, editing, deleting, and setting the publication status of job vacancies). Meanwhile, the HRD actor is responsible for managing the candidate selection process integrated with the Simple Additive Weighting (SAW) method to objectively group and determine applicants' success. Furthermore, all account roles can reset their passwords if they forget them. Finally, all these interactions are supported by the availability of a real-time chat module that facilitates internal communication management between applicants and management throughout the recruitment process.

Activity Diagram

This diagram provides an overview of the communication between external actors and the system to achieve the desired functional goals. Specifically, it maps out the sequential workflow and interactions between the User (external actor) and the Sistem (System) during the registration process.

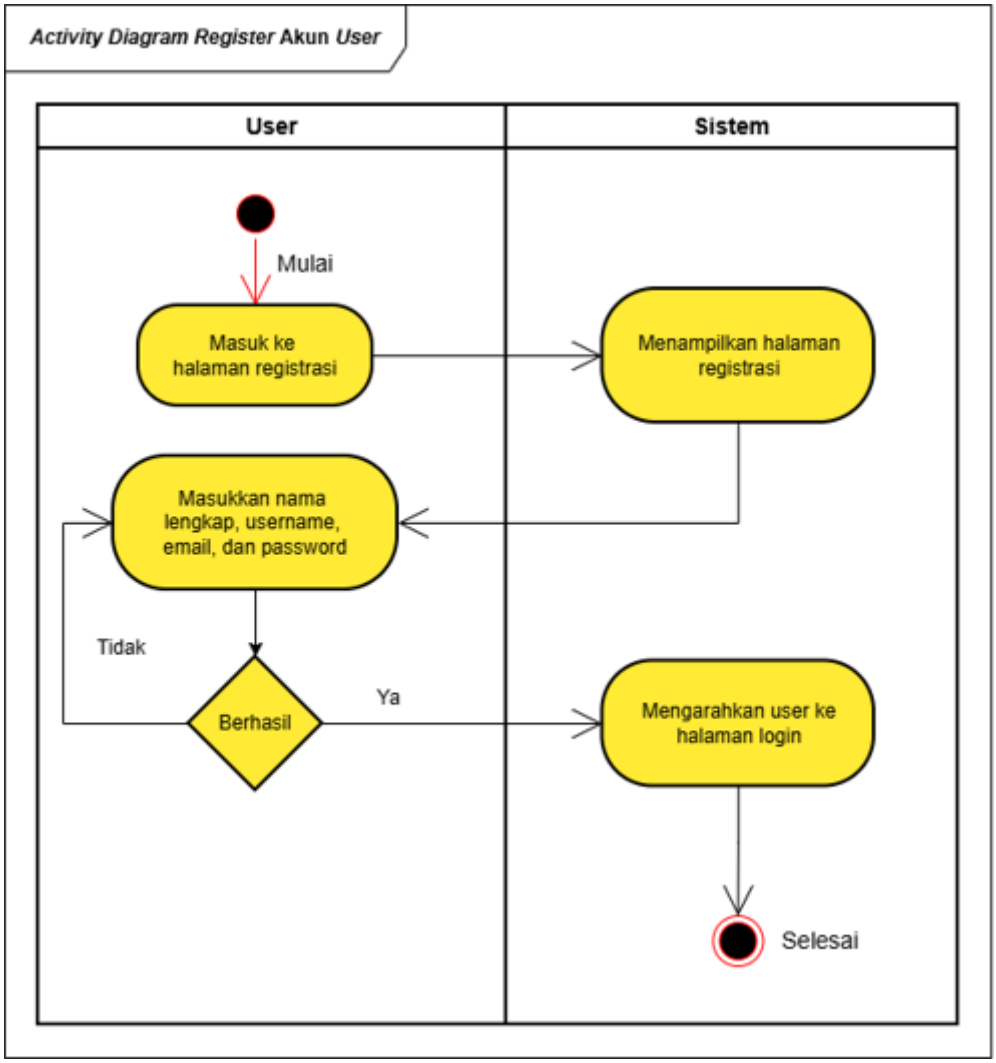

Fig. 5: Activity Diagram

The figure illustrates the initial structure and functional interactions between external actors and the e-recruitment system at PT. Digdaya Solusi Teknologi to achieve the desired functional goals. In this context, the diagram maps the sequential workflow when the User (Applicant) actor registers to connect to other system modules.

Sequence Diagram

This diagram provides a detailed timeline overview of the communication between external actors and the system objects to achieve the desired functional goals. It illustrates how the User interacts with the Register interface, the Sistem, the Database, and the Halaman Home.

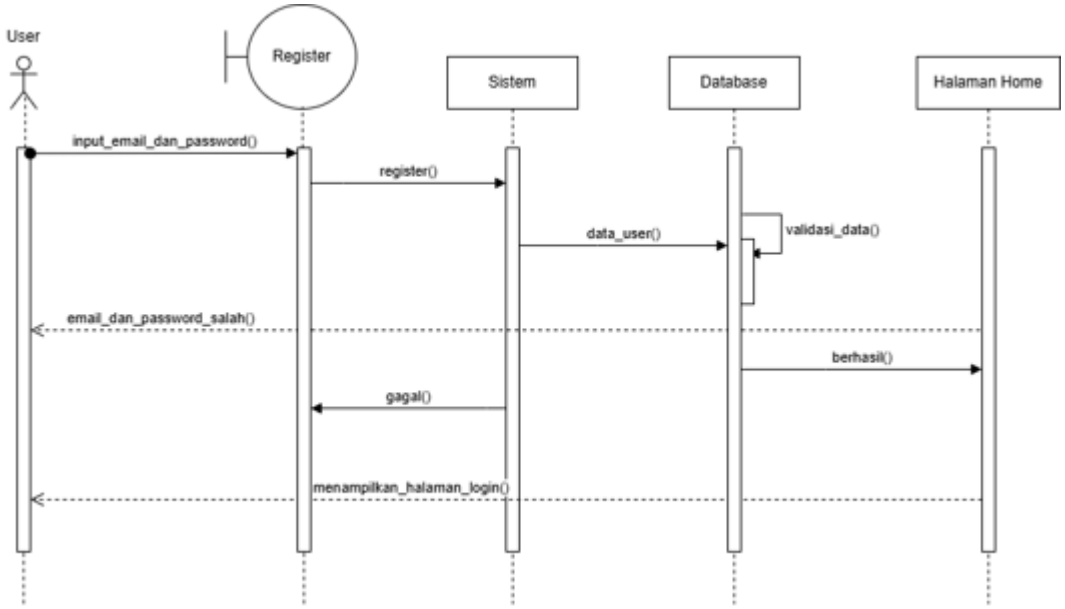

Fig. 6: Sequence Diagram

This Sequence Diagram describes the dynamic and chronological interaction of messages between system components to achieve the functional goal of authentication or continuation of the registration process for the accounts of the three main actors (User, Admin, or HRD).

5. Implementation and Testing

5.1. Interface Implementation

The following is the homepage of the electronic employee recruitment information system website at PT. Digdaya Solusi Teknologi, which displays names, menus, candidate dashboards, selection status data, and the latest available vacancies.

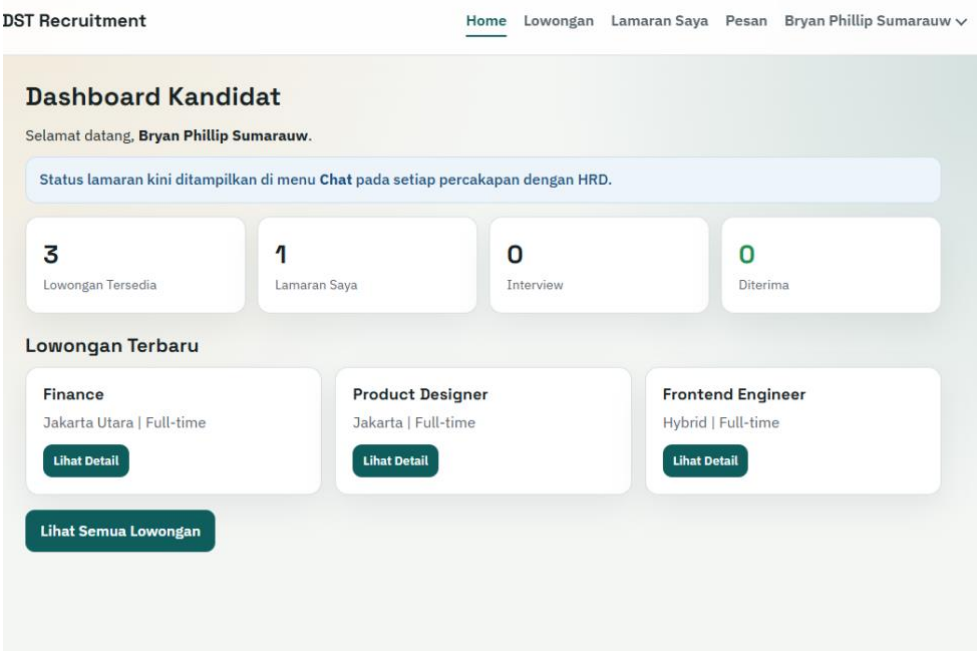

Fig. 7: Website User Home Page

This page provides detailed job vacancy information for admin accounts, as well as instructions for logging in before being able to access the available job vacancy data.

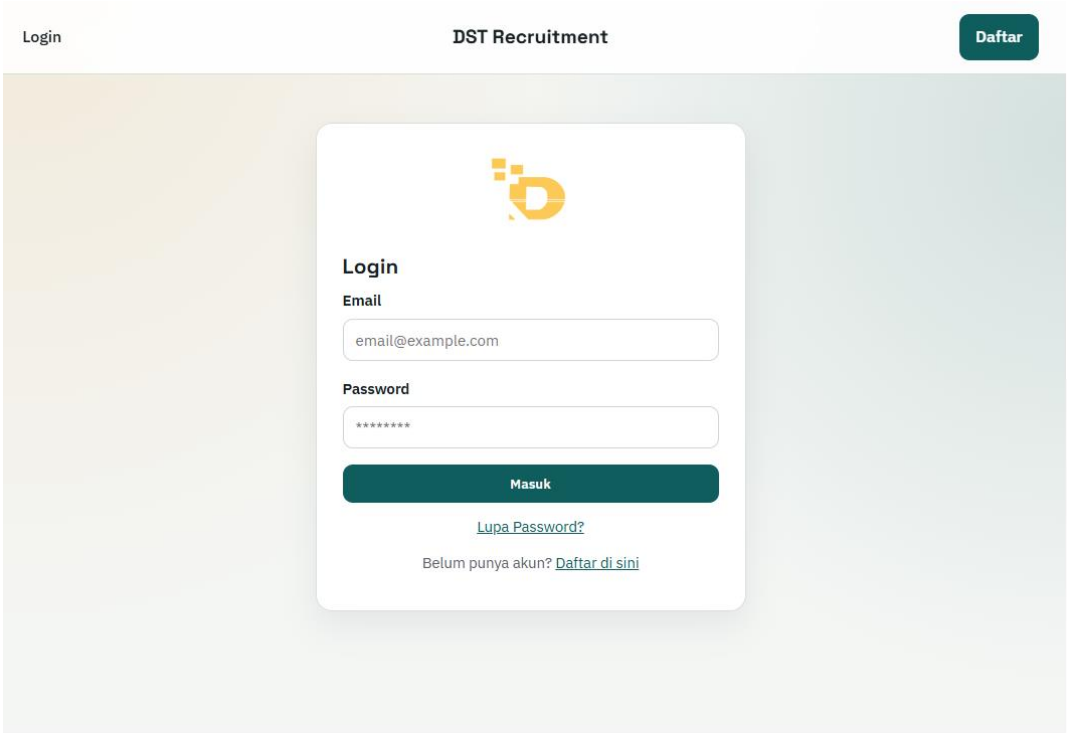

Fig. 8: Admin Login Page

This page displays candidate selection assessments in a table using the SAW (simple additive weighting) method, each with a score of education, experience, skills, and CV activities such as organizational experience and others. HR can also view candidate selection statuses, such as new, screening, interview, accepted, and rejected.

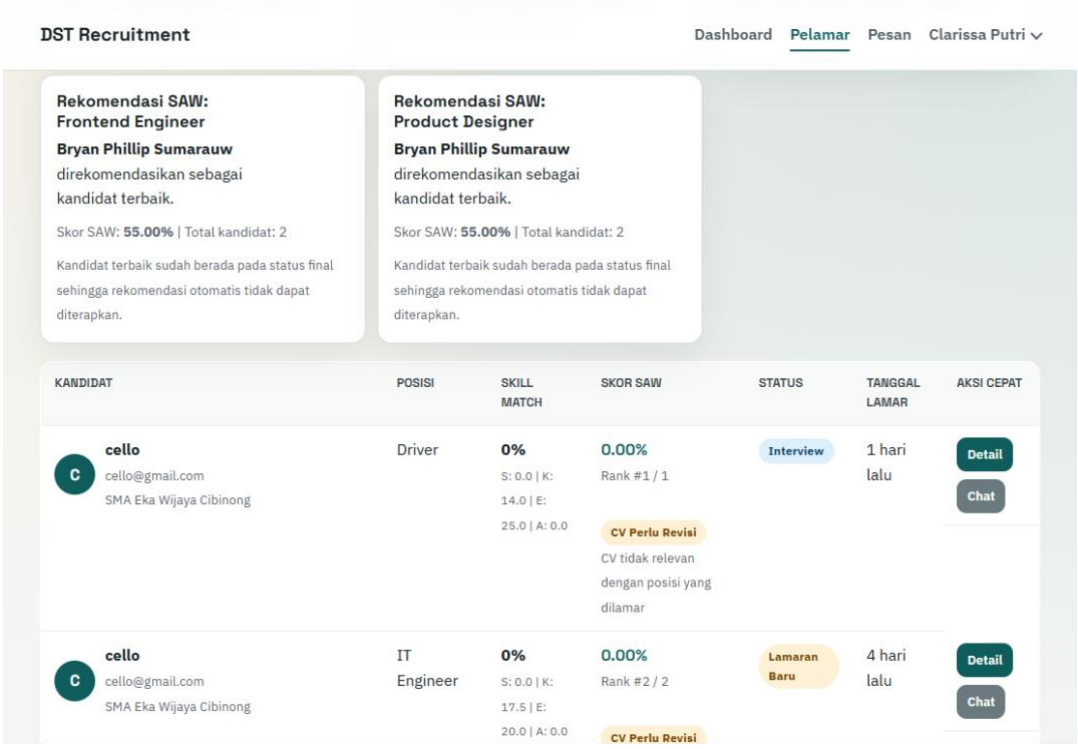

Fig. 9: Implementation of Candidate Grade List Page that can be seen by HRD

Displays the job application page made by the user.

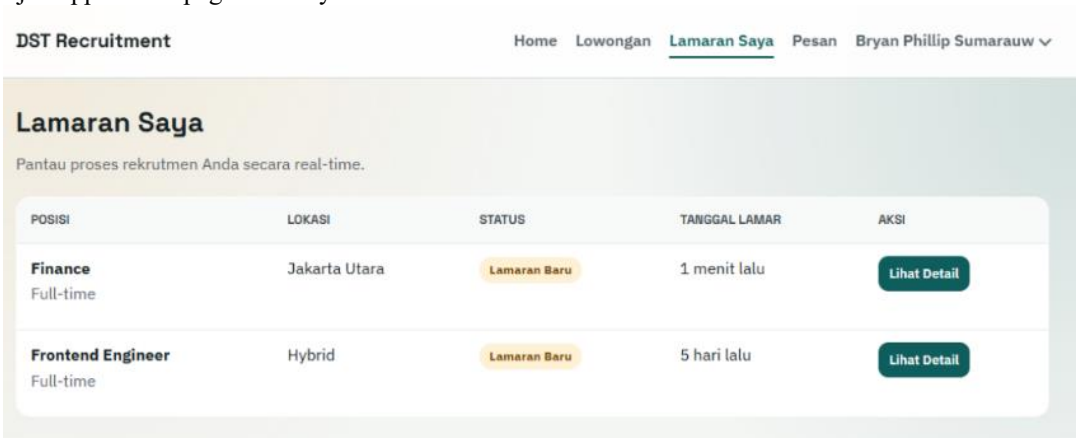

Fig. 10: job application page by user

5.2. System Testing

Researchers applied blackbox testing methods to validate that the developed employee e-recruitment application was functionally operational according to established requirements specifications. This procedure aimed to detect any technical errors or bugs in the system early, allowing for repairs to ensure software stability before official implementation.

Table 1: System Testing

No.	Item Pengujian	Deskripsi Pengujian	Kesimpulan
1.	Login Admin	Verifikasi data login	Valid
2.	Login User	Verifikasi data login	Valid
3.	Form mengirim lamaran	Mengirim lamaran pekerjaan	Valid
4.	Form tambah lowongan	Menambah lowongan pekerjaan	Valid
5.	Form edit lowongan	Mengedit lowongan pekerjaan	Valid
6.	Tombol menghapus lowongan	Menghapus lowongan yang dipilih	Valid
7.	Pengujian seleksi lamaran	Menyeleksi lamaran pekerjaan kandidat	Valid

6. Conclusion

After completing all stages of e-recruitment information system development at PT. Digdaya Solusi Teknologi, the researchers formulated the following conclusions:

1) The implementation of this system provides a competitive advantage for the company compared to manual methods through significant cost, time, and labor efficiencies, as well as strengthening PT. Digdaya Solusi Teknologi's professional image as a modern, transparent, and responsive technology-based organization to applicants.
2) The development of the e-recruitment information system was successfully implemented through the five main phases of the Waterfall model: requirements analysis, system design using Unified Modeling Language (UML), program code implementation using the CodeIgniter framework, system testing, and maintenance.
3) The implementation of this digital platform transformed conventional paper-based recruitment procedures into an automated system, thereby accelerating selection status coordination and minimizing the risk of applicant data corruption at PT. Digdaya Solusi Teknologi.
4) The application of the Simple Additive Weighting (SAW) method within the system has assisted the HR team in objectively ranking candidates based on education, experience, and skills.
5) The results of functional testing using Blackbox Testing prove that the system runs validly, while evaluation using the System Usability Scale (SUS) confirms a significant improvement in the aspects of ease of interaction and user satisfaction.

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