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Integrating Design Thinking and Agile Scrum Methodology In Human Resources Management System Development: Digital Transformation In Employee Management Case Study on PT Derma Konsep Estetika

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Abstract: In the current digital era, efficiency in human resource management (HRM) is a crucial key to the operational success of companies. This research focuses on the development of a Human Resource Management System (HRMS) application product aimed at enhancing efficiency in managing employees by digitizing critical processes such as leave requests, overtime, monthly attendance recapitulation, employment contracts, payroll information, employee personal data, employee special records, and company activity announcements. The previously manual and traditional approach has been transformed into a systematic and digital one through the application of HRMS technology. This application is designed using the Design Thinking methodology to ensure that the solutions developed are truly user-centered, by deeply understanding user needs and creating innovative and user-friendly solutions. The application development is carried out using the Agile Scrum methodology, which allows the development team to work iteratively and adaptively, ensuring flexibility in development and the ability to quickly respond to rapidly changing user needs. The results of this study demonstrate that the implementation of Design Thinking and Agile Scrum can effectively achieve digital transformation in employee management. The developed HRMS application showcases how these methodologies can revolutionize HR processes by addressing challenges and improving overall efficiency. By leveraging digital technology, the study highlights the potential for substantial improvements in managing employee administration, thereby fostering a more organized and efficient HR management system.

Keyword: Human Resource Management System, Digital Transformation, Design Thinking, Agile, Scrum.

INTRODUCTION

The management of human resources (HR) in the era of Industry 4.0 has become a crucial issue, and in line with the increasing needs of this industrial era, a comprehensive transformation is required. The lack of technological utilization, combined with the vast amount of data that HR must process, can hinder HR performance in managing human resources (HR). Many companies, especially in Indonesia, still face several HR management problems. These issues are usually caused by the large and diverse HR-related data, resulting in ineffective and inefficient HR data management and analysis (Budiyantara, 2017). As a company grows, the amount and complexity of human resources data to be managed also increase (Kepner & Tregoe, 2015). Technological advancements significantly impact business operations, and HR teams play a crucial role in helping companies face the challenges of digital transformation (shiftindonesia, 2019).

PT Derma Konsep Estetika, a company operating in the field of dermatology, faces challenges in employee management, which currently uses a manual approach. Various processes, such as leave requests, permissions, overtime, monthly employee attendance recapitulation, payroll information, and personal data completion processes, are still carried out traditionally, leading to potential errors, delays, and confusion in monitoring and reporting. Furthermore, the management of employment contracts, disciplinary violations, and the lack of a two-way information system between HR staff and employees also pose significant challenges. Continuing to use manual approaches can hinder the company's growth and efficiency, especially in managing human resources, which are key assets in achieving company goals. Therefore, a solution that can address these obstacles and enhance employee management efficiency is needed.

In today's digital era, developing an effective and efficient Human Resource Management System (HRMS) is crucial for improving employee productivity and performance across various organizations. Traditional approaches to application design and development often fail to meet the dynamic and complex needs of users, given the rapid pace of technological changes and the ever-increasing user expectations. In this context, applying the Design Thinking methodology in HRMS design offers a user-centered solution, emphasizing creativity and innovation in the design process.

Through the development of the HRMS application, PT Derma Konsep Estetika can reap significant benefits by automating these processes. By adopting HRMS technology, the company can accelerate HR administrative processes, which still use traditional approaches, thereby minimizing errors and increasing data accuracy. Therefore, developing a Human Resource Management System (HRMS) is not just a necessity but an imperative. This research aims to thoroughly and analytically investigate the implementation of HRMS at PT Derma Konsep Estetika, with a primary focus on understanding the impact of HRMS on operational efficiency. Through a holistic methodological approach, this research is directed at providing deep and detailed insights into how HRMS can be a key in leading PT Derma Konsep Estetika towards sustainable competitive advantage in this digital era.

METHOD

The research steps are broadly divided into two processes: Product Discovery and Product Delivery:

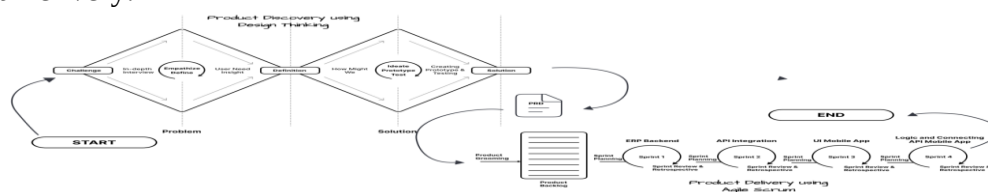


Figure 1. Research Steps

Product Discovery is the process of identifying problems and finding validated solutions using the Double Diamond Design Thinking method, which includes the stages of empathy, definition, ideation, prototyping, and testing. The results of these stages are summarized in the form of a Product Requirement Document (PRD).

The next process, Product Delivery, involves the Software Development Life Cycle (SDLC), a cycle used to effectively develop software to ensure it meets expected quality and needs. The SDLC methodology used is Agile Scrum, which includes product grooming to transform the PRD into a backlog, conducted over four sprints, each including Scrum ceremonies such as sprint planning, daily scrum, sprint review, and sprint retrospective. The use of Agile Scrum supports team collaboration, incremental product development, and an iterative process, leading to the realization of the best possible final product through a structured methodology (Sasmoko et al, 2022)..

RESULTS AND DISCUSSION

Results of Product Discovery Using the Design Thinking Method

The researcher discusses the results of the product discovery process using the Design Thinking method to design the HRMS application. Through the stages of observation, empathy, definition, ideation, prototyping, and testing, the findings are summarized into a PRD (Product Requirements Document) as the design document for the HRMS application.

1. Empathize

The results of this phase focus on understanding the needs, motivations, and challenges faced by users. The outcome of this phase includes user personas and user journey maps, which provide deep insights into the user experience.

a. User Persona

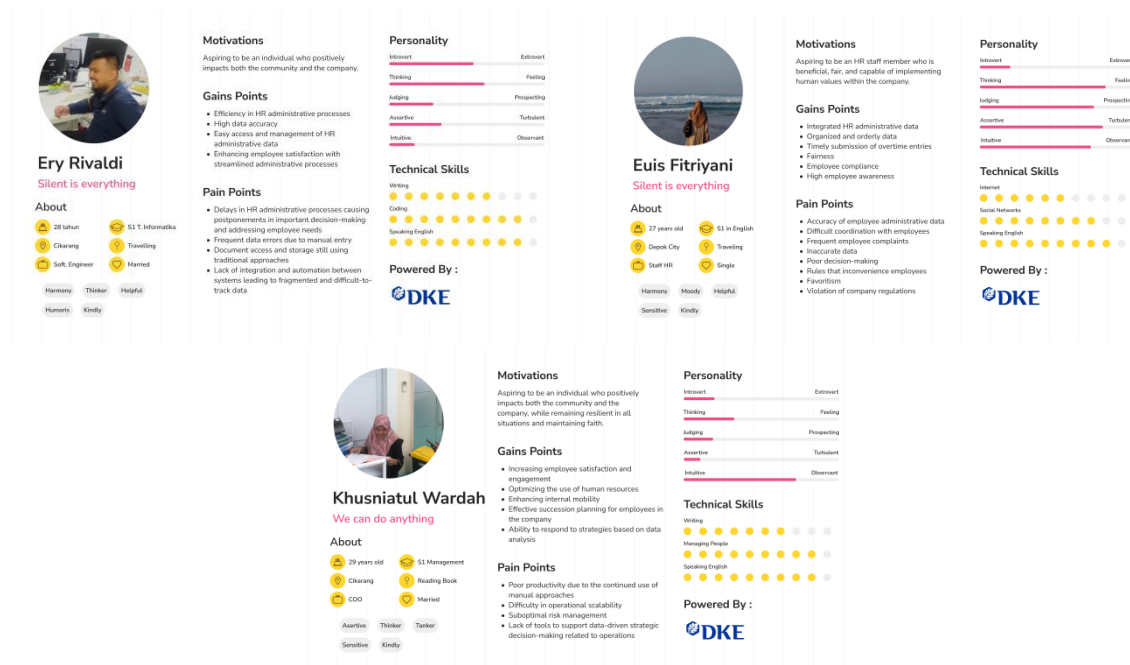


Figure 2. User Persona

Gains points for HR staff members Ery, Euis, and Khusniatul include increased efficiency and accuracy in HR administrative processes, easy access and management of HR data, enhanced employee satisfaction, and the ability to make data-driven decisions. They also emphasize the importance of integrating HR administrative data,

ensuring fairness, optimizing human resource usage, and facilitating effective internal mobility and succession planning. On the other hand, the pain points highlight challenges such as delays and errors in HR administrative tasks due to manual processes, difficulty in coordinating and managing employee data, poor productivity and scalability, and a lack of integrated systems leading to fragmented data.

b. User Journey Map

At this stage, the mapping of employee administration is conducted, which includes leave or permission requests, overtime, monthly attendance recaps, employment contracts, payroll information, special employee records, changes in personal employee data, and company announcements.

1) User Journey Map Leave or Permission Request

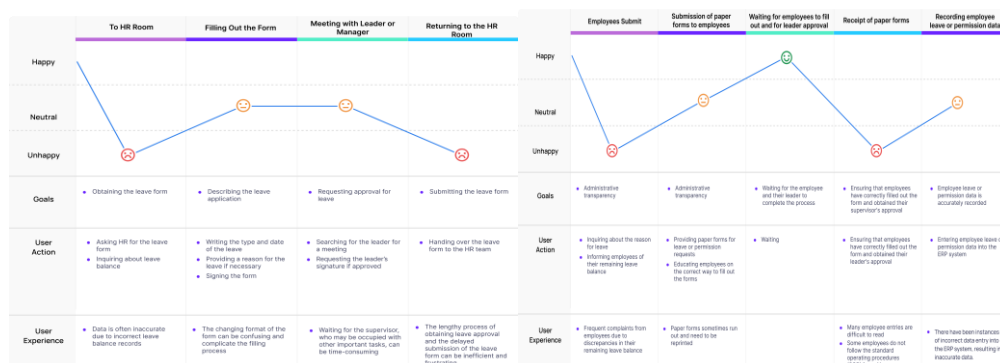


Figure 3. User Journey Map Leave or Permission Request

2) User Journey Map Overtime



Figure 4. User Journey Map Overtime

3) User Journey Map Monthly Attendance Recaps

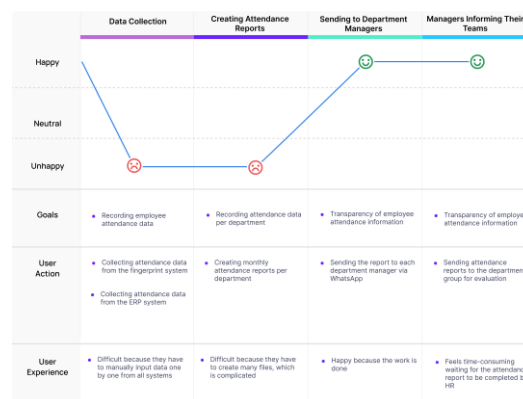


Figure 5. User Journey Map Monthly Attendance Recaps

4) User Journey Map Employment Contracts

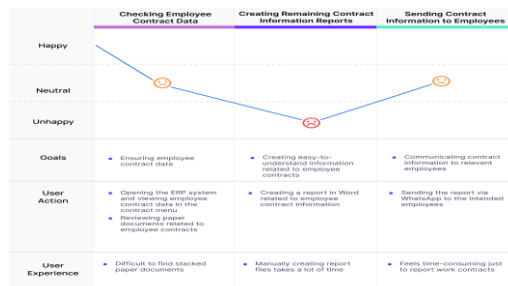


Figure 6. User Journey Map Employment Contracts

5) User Journey Map Payroll Information

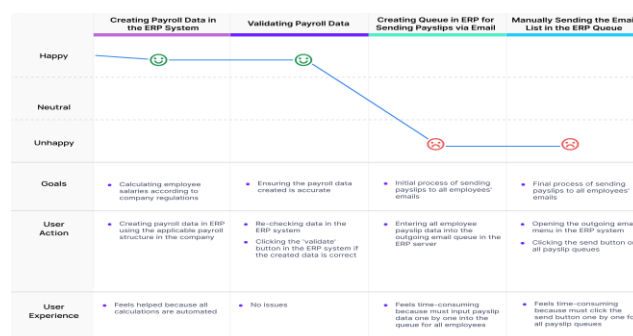


Figure 7. User Journey Map Employment Contracts

6) User Journey Map Disciplinary Action Employee Records

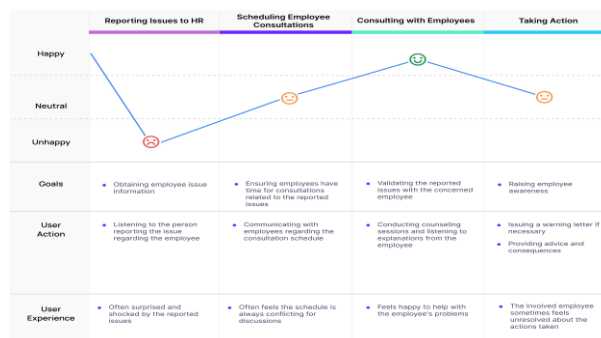


Figure 8. User Journey Map Disciplinary Action Employee Records

7) User Journey Map Changes in Personal Employee Data



Figure 9. User Journey Map Changes in Personal Employee Data

8) User Journey Map Company Announcements

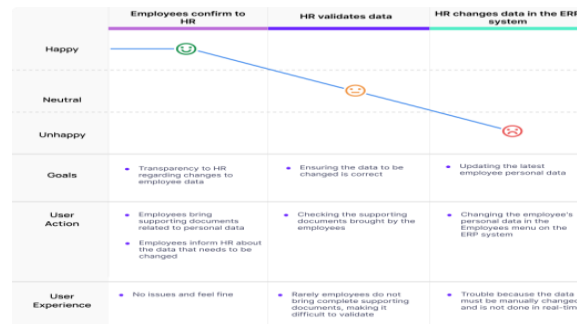


Figure 10. User Journey Map Company Announcements

The complaints identified from each user journey map in these images highlight various issues within the HR administrative processes. Employees frequently express dissatisfaction due to inaccurate leave balances, delays in administrative processes, difficulty locating documents, and data errors resulting from manual entries. Additionally, collecting overtime, attendance, and contract information takes considerable time and is cumbersome because it has to be done manually. Employees also face challenges in coordinating and understanding the administrative information provided by HR. The lack of integration and automation between systems leads to fragmented and hard-to-track data, resulting in employee dissatisfaction and frustration.

2. Define

In the definition phase of Design Thinking, the researcher focuses on delving into and understanding the needs of users, as well as the challenges faced by employees and HR staff in the HR administrative process.

Table 1. Definition Results Using User Need Insight

User	Need	Insight
An employee, supervisor/manager, and HR staff in a dynamic company facing time-consuming, paper-based leave administration processes.	Accelerating the leave management process to reduce time spent on administrative tasks and improve tracking and record-keeping.	Employees, supervisors or managers, and HR staff are seeking more efficient methods because the current manual and paper-based leave administration process is prone to errors and delays, creating unnecessary stress and workload.
An employee, supervisor or manager, and HR staff in the company face a manual, paper-based overtime administration process, as well as a manual calculation of overtime pay that aligns with the overtime hours submitted and approved, which is time-consuming.	Accelerating the overtime work process to reduce time spent on administrative tasks and improve tracking and record-keeping.	Employees, supervisors or managers, and HR staff often experience difficulties in the overtime administration process because the manual system does not provide an effective way to verify actual working hours or prevent inaccurate overtime submissions, and it fails to prevent errors in overtime pay calculations. This leads to the risk of errors and unfairness in overtime payments, as well as wasting time in the approval process.
An HR staff member at a company responsible for recording employee attendance.	Needs a more efficient and automated method for monthly attendance recaps that can reduce the time spent on	The HR staff spends a significant amount of time managing attendance because they have to enter data manually, which is often prone to errors and requires additional time for

	manual data entry and decrease associated errors.	verification. This delays their ability to analyze attendance data in real-time, which is crucial for human resource management and workforce planning.
An employee whose contract is tied to the company.	Needs quick and easy access to view their employment contract details, including start date, contract duration, and other important conditions, to enhance transparency and understanding of their rights and obligations.	Employees often feel uninformed about the details of their contracts because the current process requires manual communication with HR, which often takes a long time and sometimes results in incomplete or delayed information. This leads to uncertainty and potential dissatisfaction among employees as they cannot access their contract information independently and efficiently.
HR payroll staff in a company with many employees, responsible for sending out monthly payslips.	Needs an efficient payslip distribution process to improve efficiency and ensure the privacy and security of employee data.	Payroll staff feel that the manual payslip distribution process not only takes a long time but also increases the risk of personal and financial data breaches. Additionally, they often receive complaints from employees about delayed or undelivered payslips. Employees also express concerns about the privacy and security of their payroll information.
An HR staff member at a company responsible for managing and recording employee disciplinary cases.	Needs an effective system for documenting and accessing employee disciplinary records to facilitate the audit process and enhance accountability.	HR staff often face difficulties in managing paper-based disciplinary records, which not only take time to file but are also prone to damage or loss. Retrieving old cases becomes a time-consuming process, and there is a privacy risk as documents can be accessed or viewed by unauthorized individuals. The employees concerned also lack transparency regarding their own records, which can lead to uncertainty and a lack of trust in the HR process.
An employee who needs to update their personal information and an HR staff member responsible for managing employee data.	Needs an easier and more efficient way to update personal information without requiring face-to-face meetings, while HR staff need a system that allows them to update data quickly and accurately.	Employees often delay updating their personal information due to the time-consuming and sometimes inconvenient face-to-face process, especially those with busy work schedules or who work in different locations. On the other hand, HR staff also face challenges in scheduling and managing efficient face-to-face meetings, as well as ensuring that data updates are accurately entered into the system without errors.
Company employees who need up-to-date information and HR staff responsible for disseminating company announcements.	Needs a reliable and easily accessible way to receive company announcements, while HR staff require an effective method for disseminating information and managing the communication history.	Employees often miss important announcements or find them too late due to inconsistent manual dissemination methods and the lack of a centralized information source. This process also creates challenges for HR staff, who must ensure that every employee receives relevant information and can easily access the announcement history for future reference.

This explains that the researcher has defined that the process of requesting leave or permission by employees is often filled with time-consuming and hard-to-track paper forms. HR staff spend significant working hours just managing these requests, which could be used for other strategic tasks. In the overtime process, employees and managers face difficulties in submission and approval due to a non-transparent system prone to human error. Manual monthly attendance recaps create bottlenecks and delays in payroll processing, impacting employee satisfaction. Manually managed work contracts increase the risk of losing important documents and make timely contract renewals difficult. For payroll information, employees need a more secure and private way to receive their payslips, while HR staff require a more efficient distribution method. Employee personal data updates through manual systems pose privacy risks and make it difficult for employees to access their information. Physical disciplinary records complicate the audit process and quick information retrieval.

3. Ideate

The researcher uses the strategic "How Might We" (HMW) questions during the ideation phase of design thinking to find innovative solutions.

Table 2. Ideation Results Using How Might We

Leave Administration	
Insight	Employees, managers, and HR staff are seeking a more efficient way to handle leave administration, as the current manual and paper-based processes are prone to errors and delays, creating unnecessary stress and workload. Therefore, it is crucial to find a user-friendly and adaptable solution that can be easily integrated into the existing workflow without causing disruptions.
HMW	How might we develop a user-friendly and easily adaptable solution that can seamlessly integrate into existing workflows, reduce errors and delays in administrative processes, and thereby alleviate unnecessary stress and workload for employees, managers, and HR staff?
Overtime Administration	
Insight	Employees, managers, and HR staff often face difficulties in managing overtime work administration due to the manual system's inefficiencies. It lacks an effective method to verify actual working hours or prevent inaccurate overtime submissions, leading to errors in calculating overtime pay. This situation results in risks of errors and inequities in overtime payments and wastes time in the approval process.
HMW	How might we design an automated system that ensures accurate verification of working hours and prevents incorrect overtime submissions, thereby reducing the risk of errors and unfairness in overtime pay, while also speeding up the approval process?
Monthly Attendance Recaps	
Insight	The HR staff spends a significant amount of time managing attendance due to the need for manual data entry, which is often prone to errors and requires additional time for verification. This delays their ability to analyze attendance data in real-time, which is crucial for human resource management and workforce planning.
HMW	How might we develop a digital solution that enables HR staff to manage attendance automatically, minimize data entry errors, and provide instant access to attendance data analysis to accelerate decision-making and human resource planning?
Employment Contracts	
Insight	How might we create an accessible and efficient system for employees to view their contract details independently, reducing the need for time-consuming manual communication with HR and ensuring timely, complete, and accurate information to eliminate uncertainty and dissatisfaction?

HMW	How might we develop a digital platform that enables employees to access and verify their contract details in real-time, thereby enhancing employee satisfaction and HR administrative efficiency?
Payroll Information	
Insight	Payroll staff find that the manual process of delivering payslips not only takes a significant amount of time but also increases the risk of personal and financial data breaches for employees. Additionally, they frequently receive complaints from employees who experience delays in receiving their payslips or do not receive them at all. Employees also express concerns about the privacy and security of their payroll information.
HMW	How can we create an automated and secure payslip delivery system that reduces processing time, minimizes the risk of data breaches, and ensures that every employee receives their payslip on time and with a high level of security?
Disciplinary Action Employee Records	
Insight	HR staff often face difficulties in managing paper-based disciplinary records, which not only consume time for filing but are also prone to damage or loss. Retrieving old cases is a time-consuming process, and there is a privacy risk because documents can be accessed or viewed by unauthorized individuals. Additionally, the employees involved lack transparency regarding their records, which can lead to uncertainty and a lack of trust in the HR processes.
HMW	How can we develop a digital system for managing disciplinary records that not only optimizes data retrieval and storage processes but also ensures security, privacy, and transparency for employees regarding their own records, thereby enhancing trust and operational efficiency in HR?
Changes in Personal Employee Data	
Insight	Employees often delay updating their personal information because the face-to-face process is time-consuming and sometimes inconvenient, especially for those with busy schedules or working in different locations. On the other hand, HR staff also face challenges in scheduling and managing face-to-face meetings efficiently, as well as ensuring that the data updates are accurately entered into the system.
HMW	How can we design an employee personal data management system that enables self-service and remote updates, thereby reducing the need for face-to-face meetings and ensuring a more efficient and error-free process for HR staff and employees with busy schedules or different work locations?
Company Announcements	
Insight	Employees often miss important announcements or receive them late due to inconsistent manual dissemination methods and the lack of a centralized information source. This process also creates challenges for HR staff, who must ensure that every employee receives relevant information and can easily access the announcement history for future reference.
HMW	How might we create a centralized announcement system that can be accessed by all employees effectively and in a timely manner, ensuring that every employee receives relevant information while enabling HR staff to easily manage and track the distribution and access to historical announcements?

The table above explains the various challenges faced by employees, managers, and HR staff at PT DKE in managing different aspects of HR administration, including leave, overtime, attendance, employment contracts, payroll information, disciplinary records, personal data changes, and company announcements. Each section presents an "Insight" that highlights specific issues arising from the current manual system, such as vulnerability to errors, information uncertainty, and inefficiencies in administrative processes. Additionally, each section includes "How Might We" (HMW) questions that guide the search for innovative solutions to these problems, such as the development of

automated and digital systems that can enhance efficiency, accuracy, and transparency, while reducing the workload and stress for employees, managers, and HR staff. Consequently, this table serves as a crucial foundation for identifying needs and designing better solutions for HR administration management.

4. Prototype

Here is the prototype of the HRMS application based on the results of the Ideation stage using the Design Thinking method, which aims to revolutionize human resource management within the company.

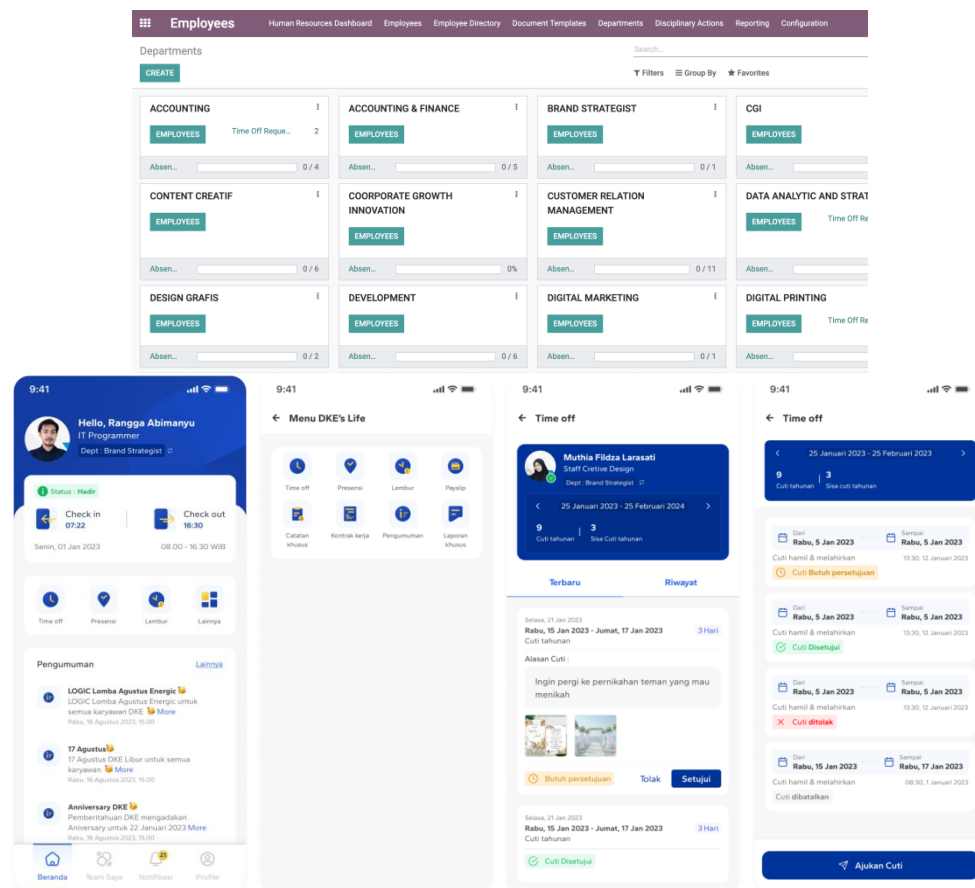


Figure 11: HRMS Prototype

5. Testing

At this stage, the prototype evaluation focuses on feature validation, ease of use, and design aesthetics, tested by the following stakeholders:

- Euis Fitriani Dewi Astuti (HR department staff)
- Khusniatul Wardah (Operational Director)
- Ery Rivaldi (IT department staff)

Table 3. Testing Results

Stakeholders	Feature Validation (Does it help solve the problem?)	Application Ease of Use (Rating 1-10)	Application Appearance (Rating 1-10)	Design (Rating)
Time Off Feature				
Euis Fitriani	Yes	8	10	
Khusniatul Wardah	Yes	9	9	
Rio Yusuf P	Yes	9	10	
Overtime Feature				
Euis Fitriani	Yes	8	9	
Khusniatul Wardah	Yes	8	9	

Rio Yusuf P	Yes	9	10
Employee Attendance Feature			
Euis Fitriani	Yes	9	10
Khusniatul Wardah	Yes	8	10
Rio Yusuf P	Yes	8	9
Payslip Information Feature			
Euis Fitriani	Yes	10	10
Khusniatul Wardah	Yes	10	10
Rio Yusuf P	Yes	10	10
Employment Contract Feature			
Euis Fitriani	Yes	10	9
Khusniatul Wardah	Yes	9	10
Rio Yusuf P	Yes	9	10
Employee Personal Data Feature			
Euis Fitriani	Yes	8	8
Khusniatul Wardah	Yes	8	9
Rio Yusuf P	Yes	8	8
Disciplinary Record History Feature			
Euis Fitriani	Yes	9	10
Khusniatul Wardah	Yes	10	10
Rio Yusuf P	Yes	8	9
Announcements Feature			
Euis Fitriani	Yes	8	8
Khusniatul Wardah	Yes	8	7
Rio Yusuf P	Yes	8	8

The evaluation results indicate that most of the features were well-validated by all stakeholders and received high scores for ease of use and attractive design. This reflects that the HRMS application being tested provides effective and efficient solutions for HR management in the company, with a high level of user satisfaction with the available features.

6. PRD (Product Requirements Document) HRMS

The HRMS PRD specifies the development of essential features to improve human resource management, each requiring backend, API, and frontend (UI and Logic) mobile app integration. The Time Off Feature allows employees to request and manage leave, the Overtime Feature facilitates the submission and approval of overtime work, the Employee Attendance Feature ensures accurate tracking of attendance record, the Payslip Information Feature provides secure access to monthly payslips, the Employment Contract Feature allows employees to view and manage contract details, the Employee Personal Data Feature enables easy updates of personal information, the Disciplinary Record History Feature manages and accesses disciplinary actions; and the Announcements Feature ensures timely and centralized dissemination of important company information. This PRD will serve as the primary reference for the HRMS development during the product delivery process.

Results of Product Delivery Using the Agile Scrum Methodology

Product delivery is defined as the process of providing products or software updates to users within a specified timeframe, emphasizing the importance of meeting tight delivery schedules in the supply chain of internet product delivery (Cruz-Mejía, Saucedo, & Vasant, 2018). Product Delivery using the Agile Scrum methodology is an adaptive and iterative approach, allowing development teams to deliver products incrementally and be responsive to changing user needs. Scrum helps in creating products that can be immediately tested by the

business, enhancing team coordination, and fostering autonomy in task execution, ultimately leading to a more effective product development process. (Rachman & Sushandoyo, 2021)

1. Product Backlog Grooming

In the product backlog grooming session, the Scrum team convenes to align their vision. This session focuses on creating and clarifying backlog items, including adjustments to features based on the HRMS PRD. The following are the members of the Scrum team.

Table 4. Scrum Team

Role	Person
Scrum Master	1 Person
Product Owner	1 Person
QA Engineer	1 Person
Backend Engineer	1 Person
Mobile App Engineer	1 Person

The Scrum team for HRMS development consists of five key roles:

- A Scrum Master, who facilitates the Scrum process.
- A Product Owner, who defines and prioritizes features.
- A QA Engineer, who ensures software quality.
- A Backend Engineer, who handles server-side development.
- A Mobile App Engineer, who focuses on the mobile interface.

Each role is filled by one dedicated person, ensuring comprehensive coverage for efficient and effective project delivery. This session focuses on creating and clarifying backlog items, including adjustments to features based on the HRMS PRD.

Table 5. List of Backlog

Backlog Code	Title	Description
H-001	[BE] Employee Leave and Permission Calculation	Develop a backend system to manage employee leave and permission requests, including submission approvals and record keeping.
H-002	[BE] Employee Overtime Administration	Develop backend features for recording and approving employee overtime work.
H-003	[BE] Payroll Information Based on Overtime Calculation	Backend system for managing and calculating employee payroll based on attendance and overtime.
H-004	[BE] Employee Disciplinary Record History	Backend for recording and managing the history of employee disciplinary violations and actions taken.
H-005	[BE] Personal and General Announcements	Develop a backend system for distributing announcements to employees, both personal and general.
H-006	[API] Employee Leave and Permission Administration	API to process and manage employee leave and permission requests, including submission and approval.
H-007	[API] Employee Overtime Administration	API that enables recording and approval of employee overtime sessions and integration with the payroll system.
H-008	[API] Monthly Attendance Recap Information	API to collect and present employee attendance data monthly, including absences and punctuality.
H-009	[API] Employee Contract Information	API providing access to employee contract details, including validity periods and other conditions.
H-010	[API] Employee Payroll Information	API to manage and present payroll information, including salary details, deductions, and bonuses.
H-011	[API] Employee Personal Data	API designed to manage and protect employee personal data, providing secure access for employees and HR.
H-012	[API] Employee Disciplinary Record History	API to record and access employee disciplinary history, including violations and actions taken.

H-013	[API] Login and Signup	API to process employee accounts for application login and signup.
H-014	[API] Personal and General Announcements	API to create and distribute announcements, both general and targeted to specific individuals or groups.
H-015	[UI Mobile] Employee Leave and Permission Administration	User interface design for mobile applications to facilitate employees in applying for and tracking the status of leave or permission.
H-016	[UI Mobile] Employee Overtime Administration	Develop mobile app UI to facilitate employees in recording overtime and enabling managers to approve digitally.
H-017	[UI Mobile] Monthly Attendance Recap Information	Intuitive interface to display employees' monthly attendance recap, supporting search and filtering functions for easy data access.
H-018	[UI Mobile] Employee Contract Information	Develop UI to allow employees and HR to view contract details, including periods and special conditions directly from mobile devices.
H-019	[UI Mobile] Employee Payroll Information	User interface design providing employees easy access to payroll information, including salary breakdown, deductions, and bonuses via mobile app.
H-020	[UI Mobile] Employee Personal Data	Mobile app UI designed to allow employees to access and update their personal data with assured security and privacy.
H-021	[UI Mobile] Employee Disciplinary Record History	User interface for displaying employee disciplinary records, providing HR and concerned employees access to such records.
H-022	[UI Mobile] Login and Signup	UI design for processing employee accounts for application login and signup.
H-023	[UI Mobile] Personal and General Announcements	Develop a user interface for internal announcements, enabling efficient information dissemination to employees through mobile app notifications.
H-024	[Logic Mobile] Employee Leave and Permission Administration	Implement mobile application logic to manage employee leave and permission request processes, including data validation and integration with work calendars.
H-025	[Logic Mobile] Employee Overtime Administration	Develop application logic for recording and approving employee overtime, including automatic overtime wage calculations based on company policies.
H-026	[Logic Mobile] Monthly Attendance Recap Information	Application logic for collecting, processing, and displaying employee attendance data monthly, allowing attendance and absence analysis.
H-027	[Logic Mobile] Employee Contract Information	Create logic to access and display employment contract information, including notifications nearing the end of contract periods.
H-028	[Logic Mobile] Employee Payroll Information	Logic to process and display employee payroll details, including salary slips, deductions, and bonuses, integrated with financial systems.
H-029	[Logic Mobile] Employee Personal Data	Develop application functionality to manage access and updates to employee personal data, focusing on data privacy and security.
H-030	[Logic Mobile] Employee Disciplinary Record History	Implement logic to record and display employee disciplinary violations history, including actions taken by management.
H-031	[Logic Mobile] Login and Signup	Develop logic to process employee accounts for application login and signup.
H-032	[Logic Mobile] Personal and General Announcements	Develop logic for the announcement system in the application, including targeting announcements to individual or groups of employees and real-time notifications.

Table 5. outlines a collection of high-priority backlogs for the HRMS application, which includes various features for managing leave, permissions, overtime, payroll, and employee data. These features are designed to ensure efficiency and ease in HR administration processes.

2. Sprint 1

Goal : Development Backend ERP

Timebox : December 4th to 15th, 2023

Here are the backlog items worked on in Sprint 1:

Table 6. List Backlog Sprint 1

Backlog Code	Title
H-001	[BE] Employee Leave and Permission Calculation
H-002	[BE] Employee Overtime Administration
H-003	[BE] Payroll Information Based on Overtime Calculation
H-004	[BE] Employee Disciplinary Record History
H-005	[BE] Personal and General Announcements

During Sprint 1, the goal was to develop the Backend ERP system using Odoo ERP technology, which took place from December 4th to December 15th, 2023. The backlog items addressed included the calculation of employee leave and permission (H-001), administration of employee overtime (H-002), payroll information based on overtime calculation (H-003), employee disciplinary record history (H-004), and personal and general announcements (H-005). Utilizing Odoo ERP technology accelerated the development process, ensuring efficient and effective implementation of these features.

3. Sprint 2

Goal : Development API from Backend ERP

Timebox : December 20th, 2023 - January 11th, 2024

Here are the backlog items worked on in Sprint 2:

Table 7. List Backlog Sprint 2

Backlog Code	Title
H-006	[API] Employee Leave and Permission Administration
H-007	[API] Employee Overtime Administration
H-008	[API] Monthly Attendance Recap Information
H-009	[API] Employee Contract Information
H-010	[API] Employee Payroll Information
H-011	[API] Employee Personal Data
H-012	[API] Employee Disciplinary Record History
H-013	[API] Login and Signup
H-014	[API] Personal and General Announcements

The second sprint, conducted from December 20th, 2023, to January 11th, 2024, focused on developing APIs for the Backend ERP system. The primary goal was to enhance various HRMS functionalities by implementing robust API integrations. The backlog items addressed in this sprint included the administration of employee leave and permissions, overtime management, monthly attendance recaps, employee contract information, payroll details, personal data management, disciplinary record history, login and signup processes, and general announcements. This sprint aimed to ensure seamless data flow and integration within the HRMS, leveraging the power of ERP Odoo for rapid development and deployment.

4. Sprint 3

Goal : Development UI Mobile App

Timebox : January 16th to 29th, 2024

Here are the backlog items worked on in Sprint 3:

Table 8. List Backlog Sprint 3

Backlog Code	Title
H-015	[UI Mobile] Employee Leave and Permission Administration
H-016	[UI Mobile] Employee Overtime Administration
H-017	[UI Mobile] Monthly Attendance Recap Information
H-018	[UI Mobile] Employee Contract Information
H-019	[UI Mobile] Employee Payroll Information
H-020	[UI Mobile] Employee Personal Data
H-021	[UI Mobile] Employee Disciplinary Record History
H-022	[UI Mobile] Login and Signup
H-023	[UI Mobile] Personal and General Announcements

During Sprint 3, from January 16th to 29th, 2024, the focus was on the development of the mobile UI for the HRMS application using Flutter technology, which facilitated rapid development. The backlog items addressed included the administration of employee leave and permissions (H-015), overtime administration (H-016), monthly attendance recap information (H-017), employee contract information (H-018), payroll information (H-019), personal data (H-020), disciplinary record history (H-021), login and signup functionalities (H-022), and personal and general announcements (H-023).

5. Sprint 4

Goal : Development Logic and Connecting API from Mobile App to ERP

Timebox : February 1st to 16th, 2024

Here are the backlog items worked on in Sprint 4:

Table 9. List Backlog Sprint 4

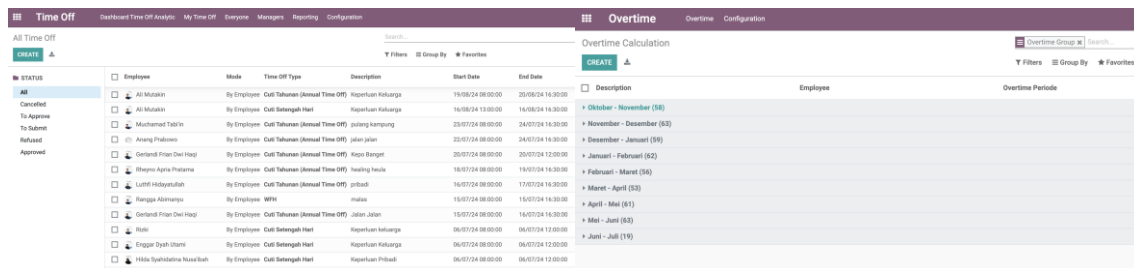
Backlog Code	Title
H-024	[Logic Mobile] Employee Leave and Permission Administration
H-025	[Logic Mobile] Employee Overtime Administration
H-026	[Logic Mobile] Monthly Attendance Recap Information
H-027	[Logic Mobile] Employee Contract Information
H-028	[Logic Mobile] Employee Payroll Information
H-029	[Logic Mobile] Employee Personal Data
H-030	[Logic Mobile] Employee Disciplinary Record History
H-031	[Logic Mobile] Login and Sign up
H-032	[Logic Mobile] Personal and General Announcements

Sprint 4, conducted from February 1st to 16th, 2024, focused on the development logic and connecting APIs from the Mobile App to the ERP system. The backlog items included in this sprint were: Employee Leave and Permission Administration, Employee Overtime Administration, Monthly Attendance Recap Information, Employee Contract Information, Employee Payroll Information, Employee Personal Data, Employee Disciplinary Record History, Login and Signup, and Personal and General Announcements. Utilizing Flutter technology accelerated the development process, ensuring efficient integration and functionality of the mobile application.

6. Resulting in an HRMS Application

From Sprint 1 to Sprint 4, the development of the HRMS application is executed with meticulous planning and execution. Each sprint included essential Scrum events such as sprint planning, daily scrum, sprint review, and sprint retrospective, ensuring continuous improvement and alignment with project goals. The use of Agile Scrum

methodology supported team collaboration, incremental product development, and an iterative process, leading to the creation of a highly effective HRMS application that transformed the digital management of employees at PT Derma Konsep Estetika.



The screenshot displays the backend interface of the HRMS application. It features two main tabs: 'Time Off' and 'Overtime'. The 'Time Off' tab is active, showing a list of employees and their time off requests. The 'Overtime' tab is also visible, showing overtime calculations. The interface includes search bars, filters, and a table of employee data.

STATUS	Employee	Mode	Time Off Type	Description	Start Date	End Date
All	Ali Muzak	By Employee	Cuti Tahunan (Annual Time Off)	Kepulauan Kelunga	16/08/24 08:00:00	20/08/24 16:30:00
Cancelled	Ali Muzak	By Employee	Cuti Batanghah Hart	Kepulauan Kelunga	16/08/24 13:00:00	16/08/24 16:30:00
To Approve	Muhammad Tabriz	By Employee	Cuti Tahunan (Annual Time Off)	gulang kampung	23/07/24 08:00:00	24/07/24 16:30:00
To Denier	Arang Prabawa	By Employee	Cuti Tahunan (Annual Time Off)	jalan jalan	23/07/24 08:00:00	24/07/24 16:30:00
Refused	Gerland Frian Dwi Hagi	By Employee	Cuti Tahunan (Annual Time Off)	Kepo Bangor	23/07/24 08:00:00	20/07/24 12:00:00
Approved	Rhegno Apria Pratama	By Employee	Cuti Tahunan (Annual Time Off)	hunting hewan	16/07/24 08:00:00	19/07/24 16:30:00
	Luthi Hidayatullah	By Employee	Cuti Tahunan (Annual Time Off)	anjrit	16/07/24 08:00:00	17/07/24 16:30:00
	Rangga Akmaraga	By Employee	WPH	maka	16/07/24 08:00:00	15/07/24 16:30:00
	Gerland Frian Dwi Hagi	By Employee	Cuti Tahunan (Annual Time Off)	jalan jalan	15/07/24 08:00:00	16/07/24 16:30:00
	Riki	By Employee	Cuti Batanghah Hart	Kepulauan Kelunga	06/07/24 08:00:00	06/07/24 12:00:00
	Enger Dyah Utami	By Employee	Cuti Batanghah Hart	Kepulauan Kelunga	06/07/24 08:00:00	06/07/24 12:00:00
	Hilmi Syahidina Nurul Bah	By Employee	Cuti Batanghah Hart	Kepulauan Pribadi	06/07/24 08:00:00	06/07/24 12:00:00

Figure 12: Backend ERP HRMS

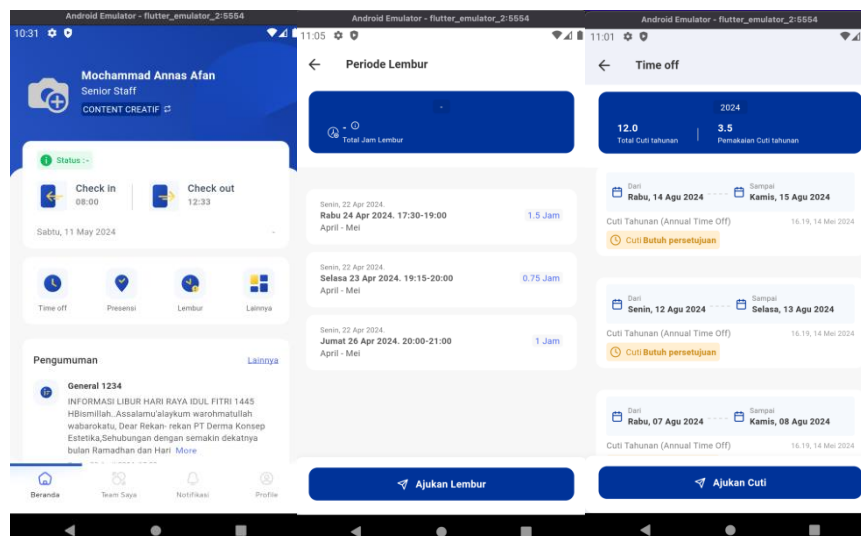


Figure 13: Mobile App HRMS

The backend ERP system, shown in Figure 12, leverages Odoo technology to manage and streamline HR processes efficiently. This robust backend facilitates comprehensive data management, ensuring accuracy and reliability across various HR functions, including employee attendance, leave, and overtime calculations. The mobile application, depicted in Figure 13, is built using Flutter technology, providing a responsive and user-friendly interface for employees. The mobile app enables employees to check in and out, apply for leave, and manage their overtime directly from their smartphones. The seamless integration between the Odoo-powered backend and the Flutter-based mobile app ensures that data flows smoothly between the systems, offering real-time updates and enhancing the overall efficiency of HR operations. This combination of technologies allows PT Derma Konsep Estetika to transition from manual HR processes to a fully digital and automated system, significantly improving operational efficiency and employee satisfaction.

CONCLUSION

The development of the HRMS application at PT Derma Konsep Estetika using the Design Thinking and Agile Scrum methods has successfully transformed HR administration from a manual approach to a digital one. Several conclusions can be drawn from this research:

1. Through the Product Discovery process, this study successfully identified various HR administrative issues in the company, such as leave management, overtime, monthly attendance recap, employment contracts, payroll information, personal data, disciplinary

records, and company announcements. Using the Design Thinking methodology, validated HRMS application features were developed to address these issues. This demonstrates how Design Thinking facilitates a comprehensive analysis of functional requirements and creates user-friendly UI/UX designs, enhancing the overall user experience. (Setiyani & Tjandra, 2022)

2. The Product Delivery process using the Agile Scrum SDLC (Software Development Life Cycle) methodology enabled the rapid and efficient development of the HRMS application. Features such as leave requests, overtime, monthly attendance recaps, employment contracts, payroll information, and company announcements were successfully implemented and easily utilized by employees. This is crucial for faster delivery and adapting to changing needs, as the industry must continually improve product development processes to deliver new and complex products in a shorter timeframe. (Thiele et al, 2020).

Thus, this research demonstrates that the development of an HRMS application based on the Design Thinking and Agile Scrum methodologies can effectively facilitate digital transformation in human resource management processes at PT Derma Konsep Estetika.

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