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Analysis of the Human Capital Information System (HCIS) Using the Design Thinking Approach at PT. Tunas Dwipa Matra

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Abstract *— Human Capital is an important asset that supports the productivity and growth of a company, especially in the fast-moving automotive industry. PT. Tunas Dwipa Matra, as the main dealer of Honda motorcycles, faces challenges in tracking employee performance, development, and career progress in a real-time and transparent way. To solve this, the company plans to develop a Human Capital Information System (HCIS) using the Design Thinking approach. This method focuses on understanding user needs and creating solutions through several stages: empathize, define, ideate, prototype, and test. Data was collected through interviews and observations within the company. The results show that an integrated mobile-based system can help management make better decisions, while also helping employees understand and improve their own performance. This study is expected to support better Human Capital management and can be a reference for other organizations developing similar systems.*

Keywords: *Design Thinking; Human Capital Information System*; *Employee Performance; Mobile Application.*

1. INTRODUCTION

PT. Tunas Dwipa Matra is the main dealer of Honda motorcycles, engaged in retail, distribution, maintenance services, and spare parts supply, in collaboration with PT. Astra Honda Motor (AHM) as the sole agent (ATPM). In the highly competitive and dynamic automotive business environment, efficiency and speed are key to a company's sustainability. One of the critical operational supports is the People Development Department, which manages Human Capital as a strategic asset of the company. Human Capital includes skills, education, health, and expertise of the workforce, which directly contribute to the organization's productivity and well-being [1]. Therefore, managing Human Capital presents both opportunities and challenges in promoting sustainable growth, especially in the constantly evolving automotive sector.

One important tool in Human Capital management is the Key Performance Indicator (KPI), a metric used to measure employee performance and the effectiveness of organizational processes, as well as to indicate the key success factors of an organization [2]. By implementing KPIs, PT. Tunas Dwipa Matra can evaluate the achievement of strategic goals and provide necessary feedback for further employee development [3]. Individual contributions reflected in KPIs become the foundation for comprehensive Human Capital development. Employees who are actively involved in achieving organizational goals tend to show higher productivity, stronger commitment, and a positive impact on overall organizational performance [4]. Moreover, the contribution of Human Capital can also be seen collectively in the performance of related work units [5].

Despite having a People Development Department, PT. Tunas Dwipa Matra still faces challenges in monitoring and distributing information related to employee performance, self-development, and career progress in a comprehensive and real-time manner. One of the main issues is the lack of data transparency between the main dealer and branch dealers, which highlights the need for an integrated, data-based information system that supports effective and efficient employee performance reporting.

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As a solution, the company initiated the development of a mobile-based information system called the Human Capital Information System (HCIS). This system is designed as an integrated information platform that documents employee performance, personal development, and career journeys across PT. Tunas Dwipa Matra's entire network. HCIS is expected to assist management in real-time performance monitoring, provide constructive feedback, and support data-driven decision-making processes.

HCIS not only focuses on improving work efficiency, but also plays a key role in encouraging individual growth and promoting organizational learning [6][7]. To support this broader purpose, the HCIS model introduces four important additional functionalities that are often missing in current HRIS systems. These include talent recognition and development, which helps identify and nurture employee potential; individualized learning development, which supports personalized learning paths for each employee; knowledge exchange management, which facilitates the sharing of information and expertise across the organization; and the development of a distributed communication database, which enhances internal communication and collaboration among employees at all levels [8]. Based on previous research by Davarpanah and Mohammed [9], an information system focused on human resource management, called HRIS (Human Resource Information System), has been developed in the higher education sector. This study found that the quality of the system and the quality of HRIS information play an important role in improving performance. Effective implementation can facilitate the role of HR as agents of change and drivers of productivity, which overall has a positive impact on individual performance within the organization.

A system is a set of interconnected elements that work together to achieve a goal, and one example is a mobile application—software designed to perform specific tasks on mobile devices [10][11]. To develop a good information system, a comprehensive analytical approach is needed to ensure alignment with user needs and organizational objectives. For this reason, the Design Thinking method is used in the design process. Design Thinking is a human-centered, iterative approach to problem-solving that emphasizes empathy, collaboration, and creativity. It engages diverse perspectives and involves understanding users explicit and implicit needs to tackle complex challenges effectively. By prioritizing the user experience and encouraging experimentation, Design Thinking facilitates innovative solutions that are both practical and meaningful [12]. Design Thinking emphasizes user empathy, creative idea exploration, and iterative prototyping before final implementation. This method has proven effective in generating digital solutions tailored to user needs [13]. At PT. Tunas Dwipa Matra, this approach helps design an HCIS application that is responsive to the needs of both management and employees, while also supporting data-driven and innovative Human Capital analysis and design.

Based on this background, this study aims to analyze and design a mobile-based Human Capital Information System (HCIS) at PT. Tunas Dwipa Matra using the Design Thinking approach. The results of this research are expected to produce a more effective, efficient, and user-friendly information system design. Additionally, this study may serve as a reference for other organizations seeking to apply a similar approach in developing Human Capital-based information systems.

2. RESEARCH METHOD

In this study, the analysis and design of the Human Capital Information System (HCIS) are conducted using a systematic approach. System analysis is the process of breaking down a system into parts to understand their functions and relationships in order to find solutions [14]. By breaking down the system into its constituent parts and examining their functions and interrelationships, the analysis aims to identify existing weaknesses and user needs. This enables the formulation of effective and efficient solutions to improve the system's overall performance. The systematic evaluation conducted during this phase lays the groundwork for proposing a well-informed system development strategy [15]. The Design Thinking process is a creative method used to understand user needs, define problems, brainstorm ideas, build prototypes, and test solutions to develop effective and user-centered innovations [16][17].

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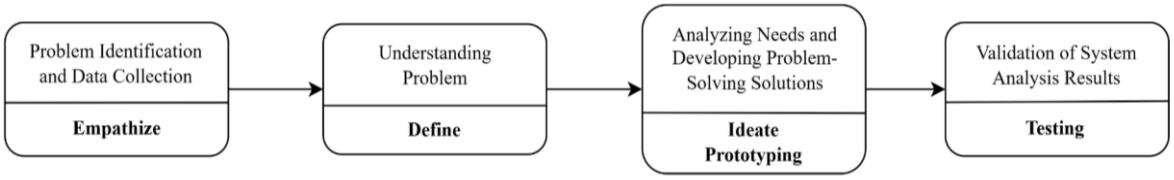

Figure 1. Design Thinking.

2.1. Empathize

At this stage, problem analysis and data collection are done through observation, interviews, and questionnaires to understand user and stakeholder needs. The author uses a mix of the Delphi method and an inductive approach within the empathize phase of the Design Thinking framework. The Delphi method gathers input from experts and decision-makers, while the inductive approach captures insights from users based on their real experiences. This combination helps create relevant tools that reflect both management views and user needs, supporting the development of the Human Capital Information System (HCIS) at PT. Tunas Dwipa Matra.

2.2. Define

At this stage, interview results that have been structured into user stories will be grouped into specific categories using an Affinity Diagram—a tool used to organize qualitative data, such as interview results, based on common themes or patterns, making the analysis and understanding of information easier.

2.3 Ideate

At this stage, a solution to the identified problems is developed. It begins with analyzing the needs of users and stakeholders to define the system's required features and functions. These are then turned into system designs using modeling tools like UML diagrams. Common diagrams used include use case diagrams, activity diagrams, and Entity Relationship (ER) diagrams [18]. These help show how the system works and what it looks like, making sure it meets user needs and business goals. All results from this stage—such as the needs analysis, system requirements, and initial designs—are combined into a System Requirements Specification (SRS) document, which guides the next steps in development.

2.4. Prototyping

At this stage, the results of the needs analysis are implemented in the form of a prototype to visualize and test the system concept before full implementation. A prototype serves as an early model of the system that allows designers to explore ideas, gather user feedback, and refine functionality before full implementation. User Interface refers to the visual and interactive elements that enable users to operate the system effectively [19]. User Experience, on the other hand, encompasses the overall experience, including usability, emotional responses, and satisfaction during interaction [20]. Together, these elements contribute to creating a system that is not only functional but also intuitive and user-centered.The prototype allows users and stakeholders to provide feedback, enabling developers to refine the system to better match user needs and expectations.

2.5. Testing and Validation

The final stage of this research is the validation of the analysis results by testing the System Requirements Specification (SRS) document based on the IEEE standard for software requirements. Validation is carried out through three main steps: (1) evaluating the quality characteristics of the SRS, such as correctness, clarity, completeness, priority, and traceability; (2) ensuring the document structure follows the standard, including the introduction, general description, requirements specification, appendix, and index; and (3) conducting requirements testing by comparing the analysis results with initial user needs, verifying the prototype, and

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performing usability testing using the System Usability Scale (SUS) [21]. Usability refers to the study that examines the interaction between a system and its users. It is generally defined as a quality attribute that assesses the ease with which users can interact with a system's interface [22]. Based on ISO/IEC 9126-4 [23], there are three main parameters used to measure usability testing: effectiveness, efficiency, and satisfaction.

i. Effectiveness: is how accurately and completely users can complete tasks. It is calculated using Formula 1:

$$\text{Effectiveness} = \frac{Number\ of\ tasks\ successfully\ completed}{Total\ Number\ of\ Task\ Attempted} \times 100\% \quad (1)$$

ii. Efficiency measures how much time or resources users need to complete tasks correctly. It is calculated using a formula that looks at the number of users, tasks, task results, and time taken.

iii. Satisfaction is how comfortable and satisfied users feel when using the system. This is measured using the System Usability Scale (SUS), which is a questionnaire with a 5-point Likert scale that help show how easy and user-friendly the system [24].

3. RESULT AND DISCUSSION

The current system for performance evaluation and reporting at PT. Tunas Dwipa Matra faces several issues. Key Performance Indicator (KPI) data is fragmented across multiple systems, making it difficult and time-consuming to consolidate and calculate performance. KPI data is also distributed manually via Excel File and WhatsApp, which increases the risk of errors and inefficiencies. Employees have limited understanding and access to their own performance data, which is usually only shared during briefings by supervisors or the branch head.

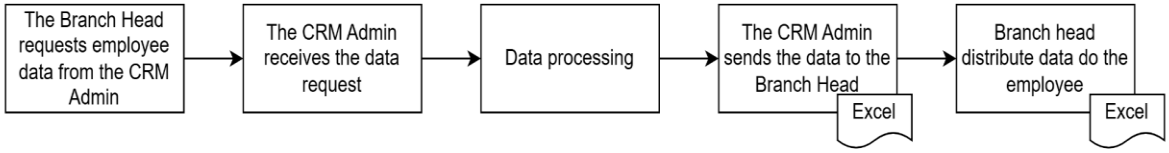

Figure 2. Data distribution flow process.

Furthermore, there is no centralized platform to monitor team performance, training results, daily quizzes, or certification progress. Access to such data often requires manual requests to CRM or the main dealer. The lack of integration leads to data fragmentation, making it hard to track performance, training, and development activities efficiently. Users and stakeholders have expressed the need for an integrated Human Capital Information System (HCIS) that enables employees to access their performance metrics, training progress, quiz results, certifications, achievements, and rankings in a centralized platform. Additionally, branch heads and sales coordinators require features to monitor team performance and productivity. Suggestions also include personalization features such as digital profile sharing, achievement badges, and notifications.

The current use of separate and manual systems for managing human capital data highlights the need for a unified, easy-to-use Human Capital Information System (HCIS). This system would store key information such as performance, training progress, and certifications in one place. Employees and managers could then access real-time data to better understand and improve performance. HCIS would also make it easier for supervisors and branch heads to monitor staff and make informed decisions. Overall, it would help boost employee development, improve productivity, and strengthen human capital management at PT. Tunas Dwipa Matra.

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3.1. System Design

The design of the Human Capital Information System (HCIS) began with the identification of functional requirements based on observations and interviews with users. This process resulted in 27 functional requirements that represent the features and services needed in the system to support the monitoring of employee performance, personal development, and career progression. These requirements were then developed into a series of system design diagrams, including use case diagrams, activity diagrams, sequence diagrams, and class diagrams. The development of these diagrams aims to provide a visual representation of the system's structure, process flows, and component interactions, thereby facilitating technical understanding and serving as a reference for an effective and user-oriented system implementation.

3.1.1. Use Case Diagram

The use case diagram for the Human Capital Information System (HCIS) illustrates the main features available to users, helping developers and stakeholders understand system functionality, as shown in Figure 3. It includes core actions such as viewing dashboards (performance, development, and journey), accessing various types of data (sales, training, repeat orders, qualified salespeople), and managing personal information.

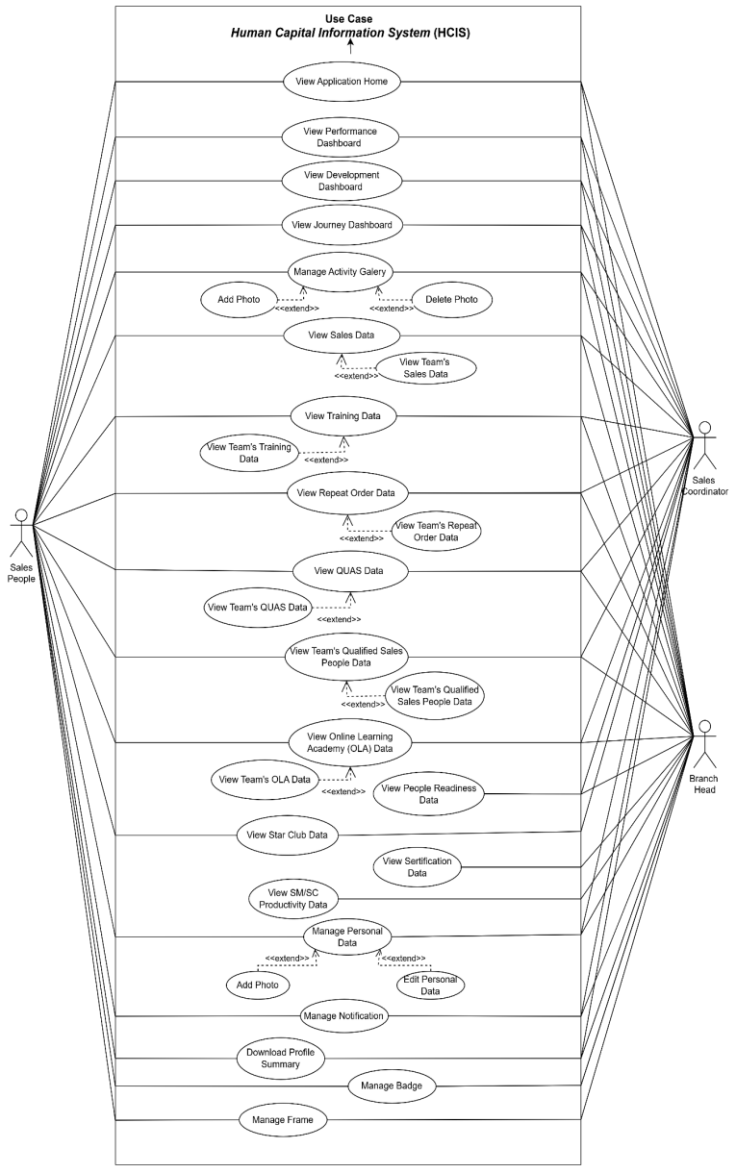

Figure 3. Use case diagram.

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Some functions are extended with optional features—for example, "Manage Activity Gallery" can be extended to "Add Photo" or "Delete Photo," and team-specific views like "View Team's Sales Data" extend from broader actions like "View Sales Data." The diagram is organized from general system views at the top to more detailed, personal settings at the bottom, reflecting a user-friendly and logical structure. Overall, this use case diagram supports the development of a modular, scalable, and user-focused system by clearly presenting the system's functionalities and possible extensions.

3.1.2. System Flow

The flowchart in Figure 4 shows how users interact with the application. It starts with the login process, where the system checks if the user is authenticated by their Honda ID as their unique identifier.

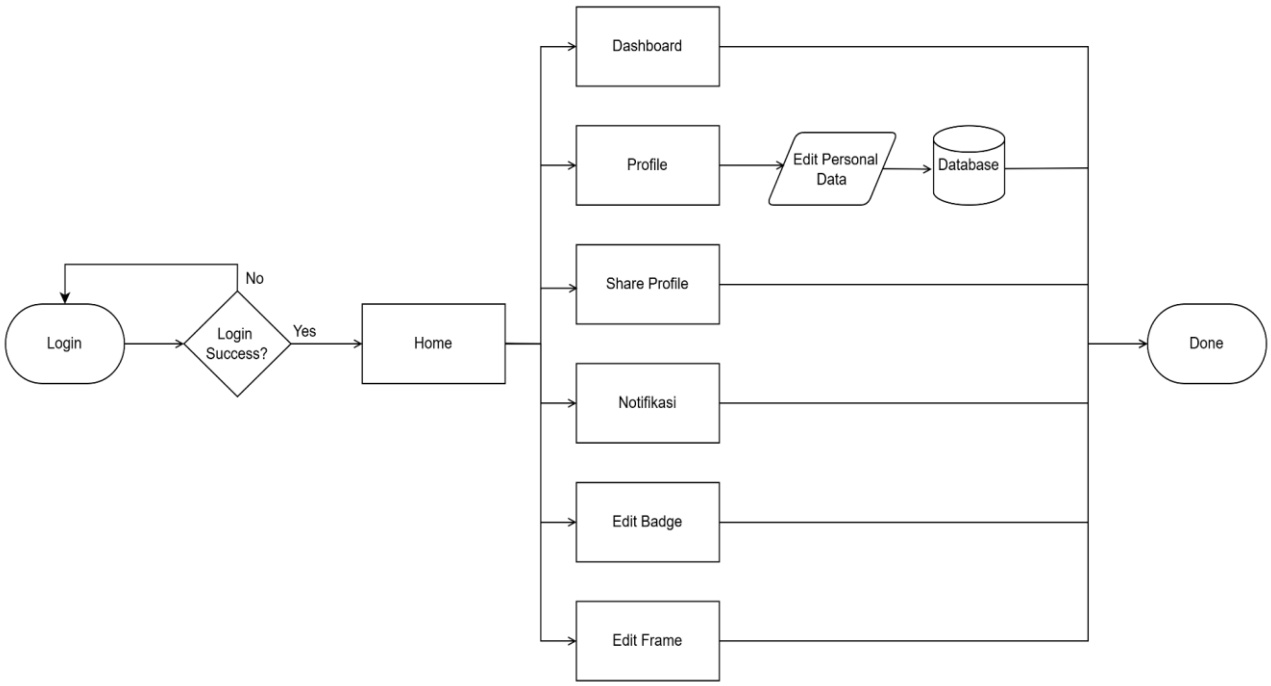

Figure 4. System flow.

If successful, the user is taken to the Home page, which serves as the main menu. From there, users can access features like the Dashboard, Profile, Share Profile, Notifications, Edit Badge, and Edit Frame. In the Profile section, users can update their personal information, which is saved in the system. The flow ends after the user finishes their tasks. This flowchart helps in analyzing the system by showing key user actions and guiding the system's design and development.

3.1.3. Entity Relationship Diagram

In this study, the analysis and design of the Entity Relationship Diagram (ERD) for the Human Capital Information System (HCIS) is conducted to identify the main data entities and to define the relationships between them. This analysis aims to clarify the flow and storage of data within the system, ensuring the design accurately reflects the company's operational needs. The ERD serves as a structured representation of the data model, providing a foundation for developing an efficient and reliable HCIS tailored for PT. Tunas Dwipa Matra. The Entity-Relationship Diagram (ERD) in Figure 5 illustrates the data structure of a performance and career management system designed to monitor and evaluate user activities, achievements, and career progression.

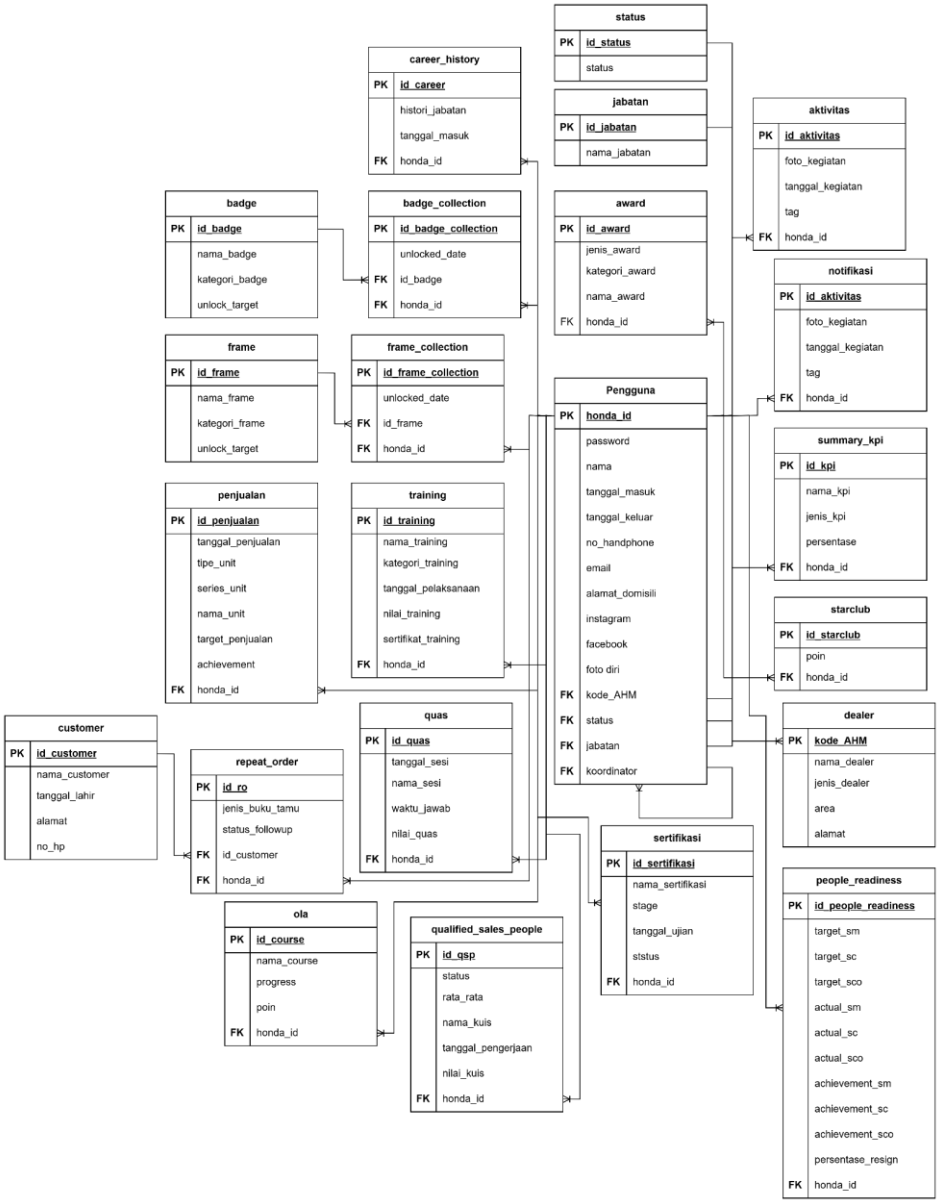

Figure 5. Entity relationship diagram.

At the core is the *Pengguna* (User) entity, which connects to various components such as career history, *jabatan* (position), status, and *aktivitas* (activity) to track employment details and work records. The system integrates performance evaluation through entities like summary_kpi, *penjualan* (sales), training, *sertifikasi* (certification), and people_readiness, enabling comprehensive assessment of individual performance and development. Gamification elements such as badge, badge_collection, frame, frame_collection, and award are used to motivate and recognize user achievements. Additional modules like notifikasi facilitate user communication, while customer, repeat_order, dealer, and qualified_sales_people support sales tracking and customer engagement. Supporting entities such as quas, ola, and starclub provide extended functionality related to auditing, system integration, or rewards programs. Altogether, this ERD represents a holistic system that integrates career development, performance tracking, sales management, and employee engagement.

3.1.5. Prototype

Prototype designs in this research are presented in Figure 6 and 7.

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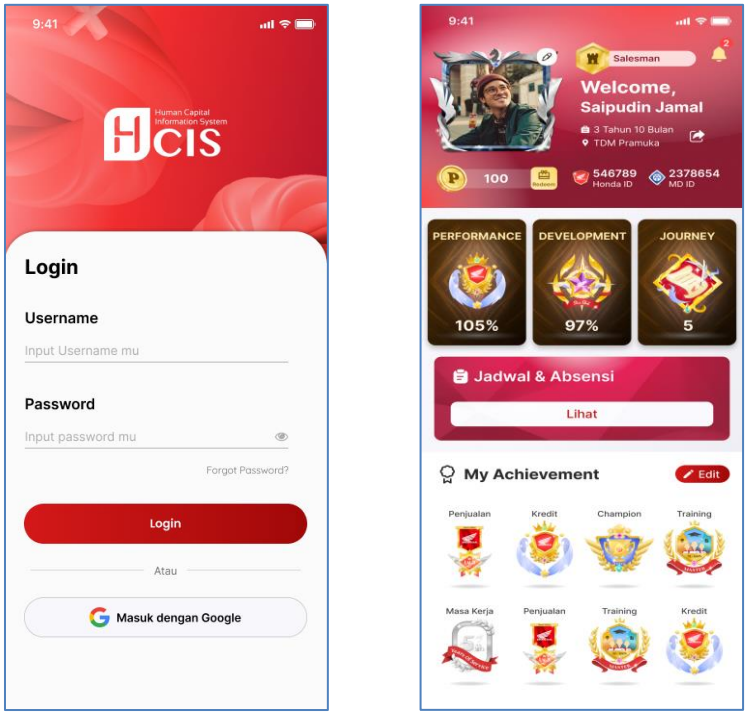
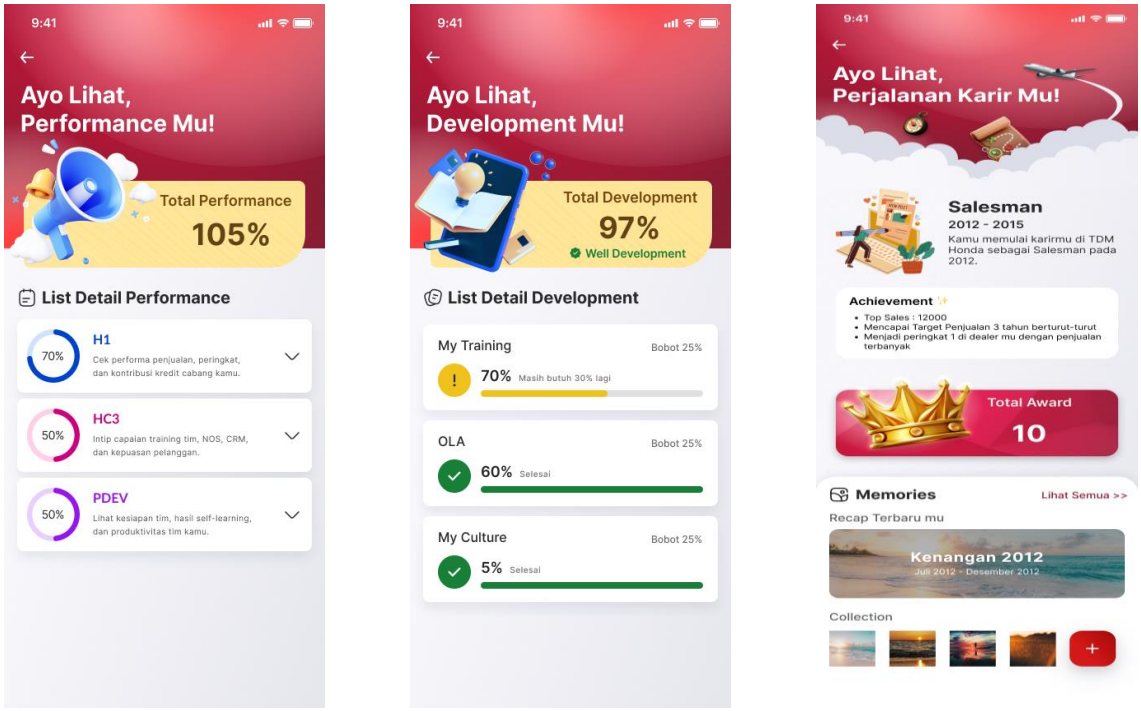


(a) (b)

Figure 6. (a) Login UI (b) Home UI.



(a) (b) (c)

Figure 7. (a) Performance dashboard UI (b) Development dashboard UI (c) Journey dashboard UI.

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3.1.6. Testing and Validation

This study employed the System Usability Scale (SUS) to evaluate the usability and user satisfaction of the developed prototype. A total of 18-27 test scenarios were designed to simulate typical user interactions with the system. Upon completion of these scenarios, participants were asked to complete the SUS questionnaire, which consists of ten standardized statements rated on a five-point Likert scale. The SUS provides a quantitative assessment of system usability, capturing key dimensions such as ease of use, system complexity, and user confidence. This method was selected due to its simplicity, reliability, and proven effectiveness in usability evaluation. The results of the SUS testing offered valuable insights into both the strengths and limitations of the prototype, thereby informing necessary refinements prior to full implementation.

a. Effectiveness

Effectiveness testing was conducted to measure how successfully users could complete tasks using the HCIS application prototype. Based on the calculation of the average effectiveness value as shown in Table 1, an average value of 100% was obtained, indicating that users were able to complete all the given usability testing tasks. This value shows that the prototype solution created can be easily operated by users.

Table 1. Effectivity test result.

Respondent	Mandatory Task	Completed Task	Percentage (%)
R1	18	18	100
R2	18	18	100
R3	24	24	100
R4	26	26	100
		Total Effectiveness (%)	100

b. Efficiency

An efficiency test using the goals-per-second approach was conducted to evaluate how efficiently the HCIS application design supports users in completing their tasks. Based on the results of the efficiency test in Table 2, conducted on the HCIS (Human Capital Information System) application design, an average efficiency score of 0.1160 goals per second was achieved. This metric indicates that users were able to successfully complete each assigned task in an average time of 8.58 seconds.

Table 2. Efficiency test result.

Respondent	Mandatory Task	Completed Task	Total Time (Second)
R1	18	18	154
R2	18	18	145
R3	24	24	202
R4	26	26	244
		Time Based Efficiency (Goals/Second)	0,11660

These findings indicate that the design of the application facilitates user interaction in a fast and efficient manner, allowing tasks to be performed with minimal interruption. The relatively quick task completion time suggests that the user interface and system features are user-friendly and easy to operate without placing a heavy cognitive burden on users. As a result, the efficiency level achieved by the HCIS application reflects its potential to enhance user productivity and optimize workflow processes within the organization.

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c. Satisfaction

User satisfaction was evaluated to assess the perceived usability and overall acceptance of the HCIS application prototype. As illustrated in Figure 8, the satisfaction levels of four respondents (R1–R4) were measured using a standardized questionnaire, and the results are presented in percentage form. The findings show a consistently high level of user satisfaction, with scores ranging from 95% to 100%. Respondent R2 reported the highest satisfaction level at 100%, followed closely by R1 and R4, both at 97%, while R3 reported a slightly lower score of 95%. These results indicate that the majority of users found the application to be highly usable, intuitive, and aligned with their expectations.

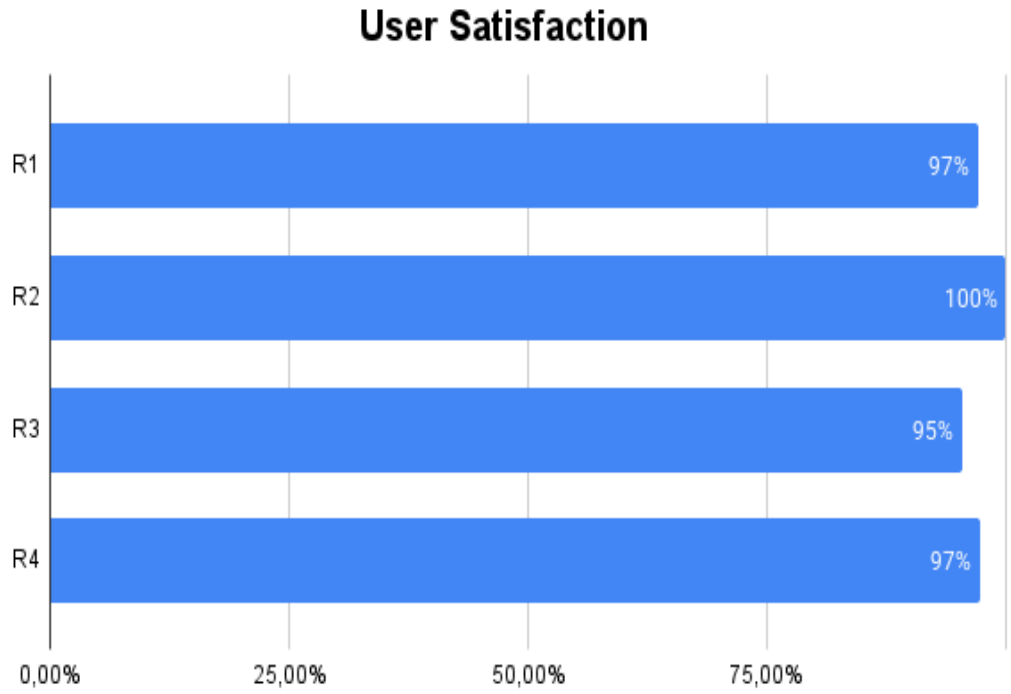

Figure 8. User satisfaction result.

Average result of user satisfaction is calculated as:

$$Satisfaction = \frac{97 + 100 + 95 + 97}{4} \times 100\% = 97{,}25\%$$

Based on the calculation of user satisfaction with the application design, a score of 97.25% was obtained. This indicates that the application design has met user satisfaction standards, as evidenced by the high satisfaction percentage.

d. Document Validation

To ensure that the proposed system design aligns with organizational requirements and technical standards, a validation process was carried out by the relevant stakeholders. Based on the validation conducted by PT. Tunas Dwipa Matra, the Software Requirements Specification (SRS) document for the Human Capital Information System (HCIS) has been confirmed to meet the company's development standards as shown in Table 3. The validation results, as shown in the Table 3, indicate that the information presented in the SRS is accurate, complete, and aligns with the needs of both the IT team and system users within the organizational network. Each element in the document has been reviewed and deemed ready for further development.

Table 3. System Requirement Specification (SRS) instrument assessment result.

No.	Assessment Instrument	Remarks
1	The information contained in the Software Requirements Specification (SRS) document has been declared appropriate and ready for development by the IT team of PT. Tunas Dwipa Matra.	Valid
2	The content of the SRS document is complete and meets the standard requirements for information system development within PT. Tunas Dwipa Matra.	Valid
3	All elements within the SRS document reflect the needs of users across the network and are deemed ready for further development	Valid

3.2. Research Implications

Based on the analysis in the Empathize and Define stages, several implications emerge for developing the performance evaluation and reporting system at PT. Tunas Dwipa Matra. These implications focus not only on improving operational efficiency but also on strengthening human capital management, transparency, employee motivation, and development. The key implications are:

3.2.1. Operational Efficiency Improvement through Integrated Systems

The lack of system integration highlights the need for a unified system that centralizes employee performance data. This reduces reliance on multiple separate platforms, minimizes manual processing, speeds up data access, and enhances accuracy. Before implementing the Human Capital Information System (HCIS), performance data distribution was manual, slow, and error-prone. Post-implementation, HCIS allows real-time access to performance data, automates backend integration and enables faster, more accurate, and self-service evaluation by employees and managers.

3.2.2. Transparency and Human Resource Development Management

Current systems lack transparency in tracking employee development such as training, quizzes, certifications, and awards. An integrated reporting system offering real-time data visibility will improve monitoring and evaluation, enabling managers to design better-targeted development programs. Greater transparency also increases employee involvement and commitment to career growth, thus enhancing overall organizational performance.

3.2.3. Reduction of Dependence on Manual Processes

Manual data handling creates bottlenecks, inefficiencies, and higher error risks. Automating data processing and reporting reduces these issues, speeds up report generation, and decreases administrative burden. In the sales and CRM data workflow, automation simplifies data extraction, cleaning, visualization, and delivery, freeing up time for strategic tasks like HR development and performance analysis. The data processing flow is visualized in Figure 14.

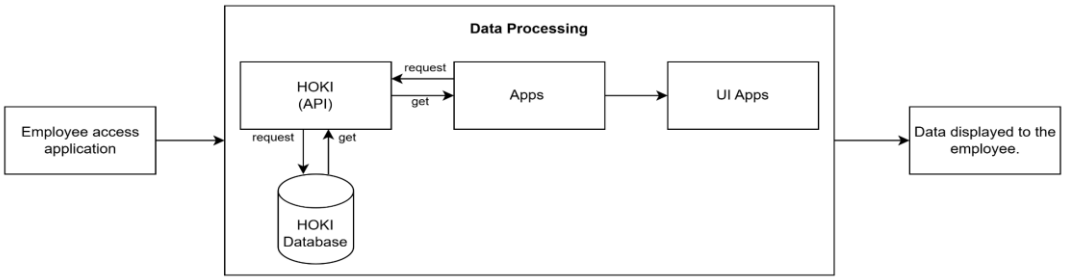

Figure 14. Data processing automation in HCIS Apps.

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3.2.4. Increased Employee Motivation and Satisfaction

Features like gamification can boost employee motivation by recognizing contributions and encouraging healthy competition. This increases employee pride, job satisfaction, loyalty, and productivity, resulting in better overall work quality [25].

3.2.5. Enhanced Data Security and Access Management with Honda ID

Using Honda ID for integrated login improves personal data security, reduces data duplication and authentication errors, and simplifies access management. This strengthens company-wide security and offers users a safer, more convenient login experience.

3.2.6. Improved User Experience through Employee Profile Digitalization

Digital employee profiles enhance professional image and facilitate sharing of achievements and performance data in a modern, integrated way. This supports stronger customer relationships and enhances the company's reputation. Additionally, converting event photos into short videos provides a dynamic, engaging way to document and share employee activities, boosting internal and external communication.

4. CONCLUSION

Based on the results of the analysis of the Human Capital Information System (HCIS) using the design thinking approach, it can be concluded that a System Requirements Specification (SRS) document has been prepared, detailing the analysis of the HCIS at PT. Tunas Dwipa Matra. This document includes both functional and non-functional requirements, supported by various diagrams such as use case, activity, class, and entity relationship diagrams, along with application prototypes that illustrate user flows and system interactions. Validation by the IT management confirmed that the SRS complies with the IEEE-830 standard and the company's internal documentation standards, leading to its approval for further development by the IT team. Usability testing showed excellent results, with an effectiveness score of 100%, an efficiency of 0.11660 goals per second, and a user satisfaction rate of 97.25%. Overall, this research successfully documented the analysis and design of a mobile-based application that aligns with both the company's business processes and user requirements. The high level of user satisfaction demonstrates that the design meets user needs and is expected to support enhanced productivity and human capital development at PT. Tunas Dwipa Matra.

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