


# Agile-Based Human Resource Management Application Development to Improve Efficiency and Effectiveness of Cargo Company Operations

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Article Info	ABSTRACT
<p><b>Keywords:</b> HR-management, Agile Methodology, Cargo.</p>	<p>This research aims to develop an Agile-based Human Resources (HR) management application to improve operational efficiency and effectiveness in a freight forwarding company. Problems faced by the company include inefficient work schedule management, unstructured training, and ineffective performance evaluation. The research method involved four main stages, namely require: requirements planning, development, and application testing. In the requirement definition stage, interviews with company management and a survey of employees were used to understand the challenges faced and user expectations of the proposed solution. Next, in the planning stage, a detailed project plan and application specifications were created to guide the development. The development stage involved prototyping, application code development, and integration of application features. Finally, the application was tested through a series of functional tests, user trials, and performance tests to ensure the quality and performance of the application. The results show that the application can address the problems faced by the company well and meet user expectations. The contributions of this research are the development of applications that are to the needs of the company, the application of Agile methodology in the development of business applications, and the provision of a foundation for further research in the field of technology-based HR management.</p>
<p>This is an open access article under the <a href="https://creativecommons.org/licenses/by-nc/4.0/">CC BY-NC</a> license</p> 	<p><b>Corresponding Author:</b> Denny Jean Cross Sihombing Atma Jaya Catholic University of Indonesia Jakarta, Indonesia <a href="mailto:denny.jean@atmajaya.ac.id">denny.jean@atmajaya.ac.id</a></p>

## INTRODUCTION

The freight forwarder that is the focus of this research is an entity operating in the logistics and transportation industry with an extensive distribution network and hundreds of employees. The well-organized organizational structure is supported by a corporate culture that focuses on reliability, speed, and quality of service. The company's vision and mission is to be a leader in the freight forwarding industry with a focus on innovation, service excellence, and customer satisfaction(Fuel Consumption within Cargo Operations at the Port Industry Fuel Consumption within Cargo Operations at the Port Industry-A Simulation Analysis on the Case of S Port Company in the UK, n.d.; Jiang & Li, 2023; Narayanan & Antoniou, 2022; Naumov et al., 2021; Soprano et al., 2023; Sung et al., 2022). However, like many

organizations, the company also faced several issues related to human resource management (HRM). The imbalance in assigning tasks to employees, the lack of an integrated training system, and ineffective performance evaluation were crucial issues that negatively impacted employee productivity and satisfaction (Chen & Cui, 2022; Li et al., 2021; Malik et al., 2023; Malmgren et al., 2023; Polkinghorne et al., 2024; Yang et al., 2023).

In proposing the development of an Agile-based HR management application, this research enriches the traditional management paradigm with a more dynamic and adaptive approach. The planned application will integrate Agile principles, such as rapid iteration, intensive team collaboration, and shared responsibility, to provide solutions responsive to the changing dynamics in the work environment. In addition, the application will facilitate management in managing employee work schedules more efficiently, with the ability to adjust tasks and responsibilities in real time according to operational needs (Almeida et al., 2022; Al-Saqqa et al., 2020; Bomström et al., 2023; Dingsoeyr et al., 2019; Estrada-Esponda et al., 2024; Najihi et al., 2022; Rindell et al., 2021; Shrivastava & Rathod, 2014).

Furthermore, through the integrated training tracking feature, the app will provide additional benefits by strengthening employee professional development and improving the quality of services the company offers. Regular performance evaluations through the app will also provide a deeper understanding of individual and team performance, enabling management to respond quickly and effectively to employee performance improvement and development needs. Thus, the proposed Agile-based HR management application is expected to provide a holistic solution that improves the freight forwarding company's operational efficiency and enhances overall employee satisfaction and engagement (Batliner et al., 2022; Baxter et al., 2023; Gutierrez et al., 2019; Humpert et al., 2022; López et al., 2022; Martin, 2023; Mishra & Alzoubi, 2023; Ouriques et al., 2023).

One of the identified knowledge gaps related to the proposed solution is the need for more applications specialized for the freight forwarding industry with an Agile approach in HR management. Therefore, this research is expected to fill the gap by developing an application that suits the needs and characteristics of the industry. The benefits of this research are diverse. For companies, implementing this application is expected to increase operational efficiency and effectiveness, which will increase customer satisfaction and reduce inefficient operational costs. As for academics and practitioners, this research will provide new insights into the application of Agile in HR management in the logistics industry and provide practical guidance in developing similar solutions in various other industries. Thus, this research is expected to contribute significantly to developing science and practice related to HR management and information technology. This research also demonstrates its relevance by expanding knowledge about the application of Agile in HR management, which can more broadly provide insights for the logistics industry and other industries facing similar challenges.

## METHODS

This research consisted of four main stages, as shown in Figure 1. The four stages passed in this research include requirements definition, planning, development, and testing of an Agile-based Human Resources (HR) management application for a freight forwarding company. The initial stage, which needs definition, involves gathering in-depth information about the challenges and needs faced by the company and its employees through interviews, surveys, and internal data analysis. Next, in the planning stage, a detailed project plan, including timelines, budget, and application specifications, was drawn up to guide the course of the project. The development stage involves implementing the application design using an Agile approach, including prototyping and incremental application code development. Finally, the application is tested through a series of functional tests, user trials, and performance tests to ensure its quality, reliability, and performance before it is fully deployed. Thus, this entire process illustrates a systematic approach to developing a solution that is expected to improve the efficiency and effectiveness of HR management in freight forwarding companies.

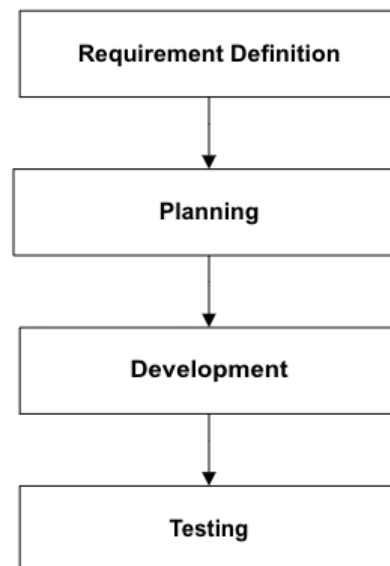


Figure 1. Research Stages

### Definition of Need

The first stage of the research was needs definition, which is a critical step in understanding the challenges faced by freight forwarders in human resource management (HRM). Activities included in-depth interviews with the company's management to gather information about the problems faced and their expectations of the proposed solution. In addition, a survey or questionnaire was also conducted with the company's employees to get a first-hand view of their experience in HR management and provide a deeper understanding of their needs. An analysis of the company's internal data was also conducted to identify trends and patterns relating to productivity, employee retention, and service quality, which would help in determining the focus of solution development.

## Planning

Planning was the second important stage in this research. In this stage, a comprehensive project plan was developed, covering aspects such as schedule, budget, and resource allocation. Detailed specifications for the Agile-based HR management application were also created, including a description of key features, user interface design, and proposed system architecture. In addition, the project team is also established, by selecting members with appropriate expertise and assigning clear responsibilities to each member to ensure smooth project implementation.

## Development

The development stage is the core of this research. After the specification and planning were completed, the team started developing the Agile-based HR management application according to the plan that had been set. The development process follows the Agile methodology, which involves iterative iterations and incremental development. The initial stage may involve creating prototypes or mockups to validate the design and features with stakeholders. Then, the application code is developed by integrating the predefined features into one complete application, ensuring that the application functions properly and meets the predefined user needs.

## Testing

After the development phase is complete, the next step is to conduct a series of careful tests of the Agile-based HR management application that has been developed. First, functional tests ensure that every application feature works as expected. This includes verifying that the system can manage employee work schedules, track required training, and conduct accurate performance evaluations. Next, user acceptance testing is conducted with company employees to ensure that the app meets their needs and expectations. Feedback from users will be evaluated to determine if any improvements or adjustments need to be made before full implementation. Finally, performance testing is conducted to evaluate the responsiveness and stability of the application under heavy load conditions or in different environments. This ensures that the application can operate smoothly and efficiently in real situations. By conducting comprehensive testing, it is expected that the developed application will be ready to be implemented in the operational environment of freight forwarding companies, bringing significant benefits in improving the efficiency and effectiveness of HR management.

## RESULTS AND DISCUSSION

### Definition of need

The results of the needs definition stage involved a series of activities to gain an in-depth understanding of the challenges and needs faced by the freight forwarder in Human Resources (HR) management. First, through interviews with the company's management, it was found that it faced challenges in managing employees' work schedules, unstructured training, and ineffective performance evaluation. Next, a survey or questionnaire was con-

ducted on the company's employees to evaluate their experience in HR management and determine their expectations of the proposed solution. From the results of this survey, it was revealed that employees wanted a more structured system for organizing work schedules, more planned training, and a more transparent performance evaluation mechanism. In addition, by analyzing internal company data related to productivity, employee retention, and service quality, areas where an Agile-based HR management application could positively impact were identified. Thus, the results of this requirement definition phase provided a solid foundation for developing a solution that suited the needs and challenges faced by the freight forwarder.

**Table 1.** Results of Needs Definition

Activities	Hasil
Interview with Management	- Challenges in organizing employee work schedules             - Unstructured training - Ineffective performance evaluation
Survey/Questionnaire to Employees	- Expectations for a more structured system in organizing work schedules - Desire for more planned training - Demand for a more transparent performance evaluation mechanism
Internal Company Data Analysis	- Identify areas where Agile-based HR management applications can positively impact, including improving productivity, employee retention, and the quality of company services.

Based on Table 1, the results of the needs definition stage show several essential aspects that the freight forwarder focuses on related to Human Resources (HR) management. From interviews with management, it was revealed that the company faced challenges in organizing employee work schedules, unstructured training, and less effective performance evaluations. This highlights the need for solutions to improve efficiency and effectiveness in HR management. A survey or questionnaire to employees confirmed their expectations for a more structured system in organizing work schedules, more planned training, and a more transparent performance evaluation mechanism. This shows the importance of listening to employees' input as direct users of the proposed solution. In addition, the analysis of internal company data highlighted areas where an Agile-based HR management application could have a positive impact, such as improving productivity, employee retention, and company service quality. Therefore, the results of this analysis provided a solid basis for developing a solution that suits the needs and challenges freight forwarders face in managing their HR.

### Planning

The results of this stage are shown in Table 2. Planning describes the overall process that has been carried out to prepare the development of an Agile-based HR management application for a freight forwarding company. First, in developing the project plan, it was

found that a detailed project plan was developed, including a clear timeline, appropriate budget allocation, and necessary resources. This shows a commitment to planning and organizing the steps required to develop the application. Secondly, in developing detailed specifications, the results showed that the application specifications were thorough, including descriptions of key features, user interfaces, and system architecture, indicating that each aspect of the application was well-considered. Finally, the project team was well formed, with members having relevant skills, experience, and clear responsibilities. The table analysis shows that the planning stage has been carried out systematically, providing a solid foundation to continue the application development process effectively and efficiently per the company's goals and needs.

**Table 2.** Planning

Activities	Results
Project Plan Development	<ul style="list-style-type: none"> <li>- A comprehensive project plan has been developed, including a precise schedule, detailed budget, and allocation of necessary resources.</li> <li>- Specific steps for each application development stage have been carefully formulated.</li> </ul>
Preparation of Detailed Specifications	<ul style="list-style-type: none"> <li>- Detailed specifications for the Agile-based HR management application have been carefully developed, including descriptions of key features, user interfaces, and system architecture.</li> <li>- Key features required have been identified.</li> </ul>
Formation of Project Team	<ul style="list-style-type: none"> <li>- A project team was established, consisting of members with relevant skills and experience. Each team member was assigned clear responsibilities according to their respective expertise.</li> <li>- The team members were selected based on technical ability, understanding of HR management, and experience in Agile-based application development.</li> </ul>

### Development

The results of this stage are shown in Table 3; the development shows the steps taken to realize an Agile-based HR management application for freight forwarding companies. First, creating an initial prototype or mockup of the application is crucial to validating the design and features with stakeholders. This makes it possible to gather initial feedback, which is critical to ensure that the app can effectively meet the needs and expectations of users before the actual app development begins. Further, in developing the application code, using Agile methodologies helps to ensure iterative iterations and incremental development, thus enabling quick response to changing needs and reasonable control of the project progress. Then, integrating the developed features into one complete application is a crucial step to ensure that the application functions properly and meets the defined user needs. This integration process involves testing and verifying features to ensure their quality and reliability before full launch. Overall, the analysis of this table shows that the devel-

opment phase has been well done and focused on ensuring that the resulting application can meet the required standards and meet users' needs well.

**Table 3.** Development

Activities	Results
Creating an Initial Prototype or Mockup	<ul style="list-style-type: none"> <li>- An initial prototype or mockup of the app was created to validate the design and features with stakeholders.</li> <li>- This process aims to gather initial feedback to help improve the design and features before the app development begins.</li> <li>- This validation is essential to ensure the application meets user needs and expectations effectively.</li> </ul>
Developing Application Code	<ul style="list-style-type: none"> <li>- The application code is being developed based on the established specifications, using the Agile development methodology.</li> <li>- The Agile methodology involves iterative iterations and incremental development, allowing flexibility in adjusting to changing needs.</li> </ul>
Integrate Developed Features into One Complete Application	<ul style="list-style-type: none"> <li>- This process ensures that each stage of development can be well controlled and the results can be periodically assessed to ensure fulfillment of project objectives.</li> <li>- The features that have been developed have been integrated into one complete application.</li> <li>- This integration process ensures the application functions properly and meets user needs.</li> <li>- Each feature has been tested and verified to ensure its quality and reliability before being fully launched.</li> </ul>

### Testing

The results of this testing phase show that the application has been thoroughly tested to ensure quality, reliability, and conformance to user requirements. Functional tests ensure each feature works as expected, and user trials ensure end users can use the application comfortably. Performance tests ensure that the application can operate appropriately under various conditions.

**Table 3.** Testing

Activities	Results
Design and Implement a Series of Functional Tests	<ul style="list-style-type: none"> <li>- A series of functional tests were designed and executed to ensure each application feature worked as expected.</li> <li>- These tests involve hands-on testing of the application features to ensure that each feature can function correctly and per</li> </ul>

	the specifications set.
Conduct User Acceptance Testing	<ul style="list-style-type: none"><li>- User trials have been conducted with company employees to ensure the app meets their needs and expectations.</li><li>- Employee participation in these trials is essential to ensure that the application can be used comfortably and effectively in their daily work.</li></ul>
Conduct Performance Tests	<ul style="list-style-type: none"><li>- Performance tests have been conducted to evaluate the responsiveness and stability of the application when run under heavy load conditions or in different environments.</li><li>- These performance tests aim to ensure that the application can operate properly and responsively even in situations that require high resource usage.</li></ul>

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The test results in Table 4 show the efforts made to ensure the quality and performance of the Agile-based HR management application for freight forwarders. First, by designing and executing a series of functional tests, testing is done to verify that each application feature works as expected and by the specifications previously set. This step is essential to ensure the application can function properly and meet the user's needs. Furthermore, through user acceptance testing involving company employees, the application is evaluated to ensure that the application can meet the needs and expectations of users. End-user involvement in this testing is essential to ensure that the application can be used comfortably and effectively in their daily work. Finally, the application's performance is evaluated under heavy load conditions or in different environments by conducting performance tests. This aims to ensure the application can operate properly and responsively even in situations requiring high resource usage. Overall, the analysis of this table shows that the testing phase has been conducted thoroughly to ensure that the application can meet the required quality standards and perform well under various conditions.

## CONCLUSION

Developing an Agile-based HR management application for a freight forwarding company is a strategic step in improving operational efficiency and effectiveness. The research stages, including requirements definition, planning, development, and testing, have been conducted thoroughly and systematically to produce a solution that fits the needs and challenges faced by the company. The analysis results show that this application is designed to address various problems in HR management, such as employee work schedule management, unstructured training, and ineffective performance evaluation. By involving end-users in the development and testing process, the app was able to meet their needs and expectations well. Comprehensive testing, including functional tests, user trials, and performance tests, has thoroughly verified the application's quality, reliability, and performance. Thus, the development of this application is expected to positively contribute to improving operational efficiency, service quality, and employee satisfaction of freight forwarding companies.



In addition, this research also contributes to the development of science in the field of HR management and the application of Agile methodology in business application development.

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