CHAPTER I
INTRODUCTION

This chapter discusses problems in the running operational process, the need to apply the Disciplined Agile Delivery (DAD) methodology, and the direction of the solution offered through integrated system development. In addition, this chapter explains the problem formulation, objectives, benefits, and research limitations as the basis for carrying out the research.

1.1. Background

Information systems have been proven to improve administrative efficiency by reducing manual and redundant work, so staff can focus more on the main exam activities [1]. This is in line with the finding that conventional management methods that depend on physical documents and manual procedures are often ineffective. According to Y. Zhang [2], dependence on manual processes not only slows the workflow, but also creates "data islands" that block information sharing between stakeholders, so it directly decreases the efficiency and quality of decision making. By applying digital technology to optimize the process, an organization can improve work efficiency, reduce possible human error, and make management more accurate.

This research aims to help UPA Pusat Bahasa UPN “Veteran” Jawa Timur improve staff operational efficiency and service quality for English Proficiency Test (EPT) participants. At this time, the organization still depends on conventional operational procedures that use physical documents and manual labor. With this initiative, it is expected that a more efficient and structured system can be created, which will improve not only service quality for exam participants but also help staff and other stakeholders in doing their tasks.

Based on interviews with the Head and staff of UPA Pusat Bahasa UPN “Veteran” Jawa Timur, it was found that current EPT management faces several basic problems. From the frontdesk side, participant registration and payment validation are still done manually, which can cause delays, recording mistakes, and difficulty in tracking data. Certificate management is currently still conventional through PERURI, printed physically with security features such as watermark and QR code to guarantee authenticity. However, staff consider this process inefficient because it takes time, adds

cost, and gives limited access to digital format. Forgery cases also show that the physical print system has not fully reduced the risk of misuse. Therefore, an internal digital certification system is needed for a faster, more transparent, and easier-to-verify process, while still keeping document security and validity.

The application of the Software Development Life Cycle (SDLC) in software development is very important to make sure that the system developed is suitable with user needs and to reduce the risk of failure. In developing the EPT Management System, SDLC gives a systematic structure for every development phase. According to Ashraf [3], the right SDLC can reduce errors and uncertainty. Hossain [4] also emphasizes the importance of choosing an SDLC methodology that suits the project, using a decision support matrix to choose the right approach, in order to maximize efficiency and quality.

Different from the Waterfall approach, the Agile methodology offers greater flexibility with shorter iterations and more responsiveness to change. However, for large projects with several teams working on different parts of the product, traditional Agile implementation is often less structured and can create its own confusion. Therefore, the Disciplined Agile Delivery (DAD) methodology is chosen as an alternative development of the Agile methodology [5]. DAD is a hybrid approach that combines several techniques from Agile methodologies, such as Scrum, Extreme Programming, and Kanban, and provides enough structure to make effective coordination between distributed teams. DAD gives flexibility to adjust practices to the specific needs of the project, not only covering software development, but covering the whole company ecosystem that focuses on producing outcomes [6].

The application of DAD in this research includes all characteristic points set by Ambler and Lines [6], but several adjustments are applied to the People first point where roles are defined according to the available human resources. With this approach, the team can work more efficiently, align several development activities, and reduce risks related to uncertainty and fast change. This is why DAD becomes a more suitable choice in optimizing EPT management, because it can handle the existing challenges in a more flexible and adaptive way [6].

The system to be developed focuses on giving digital solutions for procedures and management to improve the efficiency and transparency of EPT activities by the staff of UPA Pusat Bahasa UPN “Veteran” Jawa Timur. The modules developed in this research cover the whole EPT procedure, starting from test participant registration,

question data management, schedule, and session, certification, until analytical dashboard. In every iteration of the development phase, the development team and UPA Pusat Bahasa staff will collaborate directly to get real results.

To make the EPT system development efficient, the Laravel framework is chosen to build the backend side of the application and the React framework is chosen to build the frontend side of the application, using the communication protocol approach between both frameworks that has been designed by the InertiaJS library. Every service developed will be managed in containers using Docker to make project distribution easier for all team members and environments, assisted by the Dokploy container management system on a virtual private server. With this, it is expected that in every development iteration, application design and development can give real results to staff and other stakeholders and get useful feedback.

1.2. Problem Formulation

Based on the background explained above, the problems studied in this research are formulated as follows:

1. How to apply the Disciplined Agile Delivery (DAD) methodology in architecture design and development of an integrated EPT Management System?
2. How is the functional quality and user acceptance level of the produced EPT Management System based on technical testing and User Acceptance Testing (UAT)?

1.3. Objectives

Based on the problem formulation explained above, the objectives of this research are as follows:

1. To apply the Disciplined Agile Delivery (DAD) methodology in architecture design and development of an integrated EPT Management System.
2. To evaluate the functional quality and user acceptance level of the produced EPT Management System based on technical testing and User Acceptance Testing (UAT).

1.4. Benefits

This research is expected to give significant benefits to several parties, including:

1. For Pusat Bahasa UPN "Veteran" Jawa Timur:
   a. Improve the efficiency and effectiveness of EPT management through digitalization of administrative processes, starting from participant registration until certificate issuing.
   b. Provide centralized and accurate data through an analytical dashboard to support monitoring and strategic decision making by management.
2. For Staff and Assessors:
   a. Make it easier to manage data, schedule exams, monitor participant attendance, and handle certification systematically.
   b. Provide accurate reports that support the strategic decision making of superiors by giving insight about system performance and operational efficiency.
3. For EPT Exam Participants:
   a. Improve service quality and participant experience through registration, payment, and notification processes that are easier to access, faster, and more transparent.
4. For Academic Development:
   a. Become a reference for applying the hybrid development methodology Disciplined Agile Delivery (DAD) and container architecture in exam management systems in higher education.

1.5. Problem Limitations

So that this research is more directed and focused on the objectives that have been set, the limitations of the problem are set as follows:

1. The system developed focuses on EPT management in the internal environment of UPA Pusat Bahasa UPN "Veteran" Jawa Timur.
2. This research does not develop a platform for conducting exams online and does not develop payment features because of limited authority with the university. The system is designed to support all exam operations and management.