CHAPTER I
INTRODUCTION

1.1. Background

In the continuously evolving era of information technology, mobile applications have become a crucial component in meeting the needs of modern users, particularly in the rapidly growing property sales sector in Indonesia over the past few decades. The Qirby mobile application is specifically designed to simplify the process of displaying property information by providing a comprehensive solution. This application not only offers detailed information about available properties but also features like scheduling meetings. This scheduling feature aims to facilitate interaction between sellers and potential buyers, providing a more efficient experience in the property transaction process. Therefore, the Qirby mobile application not only meets the needs of modern users but also addresses the complex challenges in the property sales sector.

One common problem in application development, especially in the development of application interfaces, is frequently encountering the issue of writing repetitive code on every application page. Writing repetitive code has long been a problem for programmers, leading to code duplication, making the written program less efficient and less flexible, and complicating the maintainability process. [1] [2]. To address this issue, an architecture is needed that can break down repetitive lines of code into individual components. These components can then be reused throughout the interface in the Qirby mobile application so that the code does not have to be rewritten. Thus, these separate code components can reduce code duplication and facilitate the maintainability process.

In the development of the Qirby mobile application interface, the chosen architecture is Component Based Architecture (CBA). This architecture focuses on an approach that involves the development and reuse of application components, with levels that allow programmers to understand and analyze the necessary trade-offs, such as creating components, editing components, replacing components, and more. Additionally, this architecture can be integrated into the development process, enabling more focused separation of concerns. The use of Component Based Architecture aims to separate specific aspects of a system into independent components and make these components reusable when needed, thereby reducing code duplication and facilitating maintainability [1] [3] [4].

In this study, the focus is on the implementation of Component Based Architecture in the development of the Qirby mobile application interface using the Flutter framework, which leverages the Dart programming language. Flutter is designed to assist programmers in creating high-performance mobile applications that can be published on both Android and iOS platforms from a single codebase [5]. The Dart language further streamlines the development process because it is optimized for creating fast applications across various platforms [6].

After implementation, an evaluation and analysis are needed to prove whether the implementation of CBA in the Qirby mobile application interface developed in the Flutter framework indeed makes the code reusable, thereby reducing code duplication and improving maintainability. This will involve comparing these aspects with the development of the Qirby mobile application interface that does not implement CBA. The tool used for this evaluation and analysis is SonarQube. SonarQube is a static code analysis tool that helps identify code duplication, code complexity, and other issues that can affect application maintenance [20]. Using these tools ensures that the implementation of CBA can be tested objectively, and

allows for comparison of code quality metrics between the development of the Qirby mobile application interface that implements CBA and the development of the Qirby mobile application interface that does not implement CBA, in terms of duplicate code, code complexity, and maintainability index, and to ensure that CBA does indeed improve code quality and maintenance.

1.2. Topics and Limitations

Based on the background above, this research will focus on the implementation of Component-Based Architecture in the development of the Qirby mobile application interface using the Flutter framework and Dart programming language. It will evaluate the implementation using SonarQube and compare it with the development of the Qirby mobile application interface that does not implement Component-Based Architecture, specifically evaluating code quality, particularly in terms of code duplication and application maintainability.

1.3. Objective

The goals of developing the Qirby mobile application interface are to implement Component-Based Architecture within the Flutter framework, thereby enabling the development of reusable components, reducing code duplication, and improving maintainability. Additionally, using SonarQube aims to evaluate code duplication and maintainability of the Qirby application, and to compare it with the development of the Qirby mobile application interface that does not implement Component-Based Architecture. This will help ensure that Component-Based Architecture can indeed reduce code duplication and enhance application maintainability.

1.4. Organization of Writing

In this paper, several related studies and an explanation of the implementation of Component-Based Architecture in the development of the Qirby mobile application interface are discussed in Section 2. Section 3 explains the research process to achieve the objectives. Then, Section 4 presents the results and analysis of the research process. Section 5 provides the conclusions.