

## I. INTRODUCTION

Software product testing is one of the phases of the Software Development Life Cycle (SDLC), which aims to find errors in the source code that might cause bugs in software functionality. Testing can improve the quality of software. There are two types of testing, namely manual testing, and automation testing. Automation testing is far more efficient and accurate, and the script can be easily documented and updated compared to manual testing [1]. When automating testing on web-based applications, the tester may need to invest time and effort in learning the tools that will be used later [2].

The method used in this research is BDD. Behavior-Driven Development (BDD) is an agile software development methodology that assists teams in creating high-quality, fast-moving software [3]. BDD was first introduced by Dan North in the early 2000s as an easier way to teach and practice test-driven development (TDD) [4]. The BDD method was chosen because its main benefit is to facilitate organized communication within teams, meaning that product owners, developers, and testers will have a better-shared understanding of how the system works. Requirements written by the customer in a given-when-then format can be immediately used as a starting point for acceptance tests. This means that it is easier for non-developers to participate in the creation of acceptance tests [5]. Many tools that can be used for automation testing have been developed. There are at least 59 tools that can be used for automated testing. The first tool, Cucumber, was chosen because it is a well-known open-source testing tool that supports BDD. Cucumber has 3200 stars on GitHub and 634 forks. Robot Framework was chosen as the second tool because it is popular and supports BDD. Robot Framework has 5600 stars on GitHub and 1600 forks [5]. The first testing tool, Selenium Cucumber, was chosen because it is an internationally renowned framework and open source. The second test tool is the keyword-driven open-source framework (Robot Framework), which was also chosen because it is comprehensive and is used by many large international companies [6] and robot framework is very easy to use in writing test scripts. The Robot Framework has a very modular architecture [7]. The two test tools are the most well-known testing tools according to the GitHub platform and support BDD, which will be used in this research.

In Juuso Jokio's research, namely "Test automation tools: Robot Framework vs. Selenium-Cucumber" [6], which focuses on automatic testing to test the functionality of the e-mail service, namely the login feature that is implemented in several browsers, there is no specific test case used by researchers. Therefore, in this study, the researcher uses the same framework as the previous study but with more specific test cases, not only for the login feature but also for other features, so that the researcher can see and analyze the differences between the two betters. Researchers tried comparative efforts on Cucumber and robot frameworks, which were carried out to assist testers in comparing and determining automated testing tool frameworks in the BisOps Logee Port Web Admin case study based on the effectiveness and efficiency of testing tools so that testers do not need to spend time trying and analyzing both, and testers making specific test cases as test documentation, which will help the testers in terms of trying and analyzing both. Because this research involves evaluation and comparison, several criteria were chosen to support the evaluation process, namely functionality, reliability, usability, performance efficiency, and portability [1].

The case study in this research refers to the Web Admin BisOps Logee Port, which is a web-based application for Internal Admin Operations that is useful for managing NPCT-1, NLE, and KOJA master data and located in Indonesia. NPCT-1 is a web-based one-stop service platform for handling import and export containers and ordering fleets to and from Container Terminals; NLE is a web-based application for a logistics ecosystem that aligns the flow of international goods and documents traffic from the arrival of the means of transportation until the goods arrive at warehouses; KOJA is a web-based one-stop service platform for handling import and export containers and ordering fleets to and from Container Terminals.

This research effort was carried out to help the logee port QA team (developers) in determining and comparing which tools are better and more efficient for the BisOps Logee Port Web Admin project so that the team does not need to spend time trialing and analyzing the automation tools to be used. Also, complete documentation will make it easier for future developers if they want to make improvements to the website, and developers can consider which features should be fixed, added, or even removed [8][9].