

I. INTRODUCTION

Application development is popular because the use of applications has now become one of the daily necessities, meaning that applications are always developed to meet user needs. Developers can develop applications using the native application methods or tools of a particular platform. However, this requires more efforts if the application is expected to be run on multiple platforms, since the developer has to build the application for every platform. This issue forces developers to spend more energy and extra time just to develop one application that can be run on every platform. To solve this issue, multiplatform application development provides a better solution where the developers do not have to design and implement applications on every platform separately that requires each platform's knowledge including programming languages, programming interface design, and development guidelines [1].

Multiplatform application development helps application developers to develop and run an application on multiple platforms from a single codebase [2]. However, multiplatform application development does not always ensure that the application will run exactly the same on every platform [3]. There is a significant reduction in Frame Per Second (FPS) due to application scrolling is too fast or empty blocks being read [4]. The solution to these problems is to take advantage newer framework tools, such as Flutter that supports mobile application developers to develop and run the application according to the platform specific functions and appearances [5]. In addition, applications that use Flutter have syntax consistency and stable Frame Per Second (FPS) in dealing with user input and reading animations [4]. However, there has been no study that evaluate Flutter portability performance in depth as the focus is usually on either efficiency or resource utilization [6].

Portability is the ability of an application to operate both visually and functionally in different environments. Based on a recent systematic literature review related to software portability [7], past studies used only a particular metric to measure software portability. They are lacking standards as the main baseline and reference. Our study considers ISO 9126, a well-known international standard that has been used frequently to evaluate software quality.

This study contributions are proposing a set of metrics to measure portability based on ISO 9126 and evaluating Flutter as one of the popular frameworks to develop a multiplatform application. In the first contribution, we try to answer one of our research questions, "*How to measure application portability based on ISO 9126 standard?*". The answer to this question will be able to help future studies to measure portability of other applications. The second contribution will be able to provide recommendation for mobile developers whether Flutter is suitable to develop applications with high portability. This contribution revolves to answer another research question, "*How is the portability performance of a mobile application developed using Flutter?*". To answer this question, we developed a multiplatform application named Ahulang, a simple attendance check-in app, using the Flutter framework. To measure the metrics, we tested the application on several Android and iOS devices and emulators to see the portability performance of Flutter.