

Perbandingan React Native Dan Flutter Dalam Pengembangan Sistem Aplikasi Kasir Resto

Awi Yunawan Putra
H1D021066

ABSTRAK

Perkembangan teknologi mobile mendorong penggunaan framework lintas platform dalam pengembangan aplikasi kasir restoran, di antaranya React Native dan Flutter. Perbedaan arsitektur kedua framework tersebut menimbulkan karakteristik performa yang berbeda sehingga perlu dianalisis secara empiris. Penelitian ini bertujuan untuk membandingkan performa React Native dan Flutter dalam pengembangan aplikasi kasir restoran berbasis mobile berdasarkan parameter *load time*, *CPU usage*, dan *memory usage*. Metode pengembangan aplikasi yang digunakan adalah *waterfall* yang meliputi tahap analisis kebutuhan, perancangan sistem, implementasi, pengujian, dan *deployment*. Pengujian fungsional dilakukan menggunakan metode *black box testing* untuk memastikan seluruh fitur berjalan sesuai kebutuhan, sedangkan pengujian performa dilakukan menggunakan Android Studio Profiler melalui beberapa skenario penggunaan aplikasi seperti login, transaksi, pengelolaan data, dan laporan. Hasil pengujian menunjukkan bahwa React Native memiliki waktu muat awal aplikasi yang lebih cepat dengan rata-rata *load time* sebesar 617,6 ms pada emulator dan 1.489,4 ms pada perangkat fisik, sedangkan Flutter mencatat rata-rata 1.942,8 ms pada emulator dan 2.625,5 ms pada perangkat fisik. Namun, dari sisi penggunaan sumber daya, Flutter menunjukkan efisiensi yang lebih baik dengan rata-rata *CPU usage* lebih rendah (42,93% emulator dan 19,44% perangkat fisik) dibandingkan React Native (57,1% dan 28,16%), serta *memory usage* yang lebih kecil (187,39 MB dan 358,09 MB) dibandingkan React Native (267,15 MB dan 428,27 MB). Selain itu, ukuran *build* aplikasi Flutter yang lebih kecil (52 MB) dibandingkan React Native (172 MB) turut berkontribusi terhadap efisiensi penggunaan sumber daya. Berdasarkan hasil tersebut, dapat disimpulkan bahwa React Native unggul pada aspek kecepatan *startup* aplikasi, sedangkan Flutter lebih optimal dalam efisiensi CPU, memori, dan ukuran distribusi aplikasi, sehingga pemilihan *framework* perlu disesuaikan dengan prioritas kebutuhan pengembangan aplikasi kasir restoran berbasis mobile.

Kata Kunci: Android Studio, Aplikasi kasir, Flutter, Mobile, Perbandingan Performa, React Native.

Comparison of React Native and Flutter in the Development of a Restaurant Cashier Application System

***Awı Yunawan Putra
H1D021066***

ABSTRACT

The rapid advancement of mobile technology has encouraged the adoption of cross-platform frameworks in the development of restaurant cashier applications, particularly React Native and Flutter. The architectural differences between these two frameworks lead to distinct performance characteristics that require empirical analysis. This study aims to compare the performance of React Native and Flutter in the development of a mobile-based restaurant cashier application based on load time, CPU usage, and memory usage parameters. The application development method used is the Waterfall model, which includes the stages of requirement analysis, system design, implementation, testing, and deployment. Functional testing was conducted using the black box testing method to ensure that all application features operated according to requirements, while performance testing was carried out using Android Studio Profiler through several usage scenarios such as login, transactions, data management, and reporting. The test results indicate that React Native provides a faster initial application load time, with an average load time of 617.6 ms on the emulator and 1,489.4 ms on a physical device, whereas Flutter records an average of 1,942.8 ms on the emulator and 2,625.5 ms on a physical device. However, in terms of resource utilization, Flutter demonstrates better efficiency with lower average CPU usage (42.93% on the emulator and 19.44% on the physical device) compared to React Native (57.1% and 28.16%), as well as lower memory usage (187.39 MB and 358.09 MB) compared to React Native (267.15 MB and 428.27 MB). In addition, Flutter's smaller application build size (52 MB) compared to React Native (172 MB) also contributes to improved resource efficiency. Based on these findings, it can be concluded that React Native excels in application startup speed, while Flutter is more optimal in CPU efficiency, memory usage, and application distribution size. Therefore, the choice of framework should be aligned with the development priorities of the mobile restaurant cashier application.

Keywords: *Android Studio, Cashier Application, Flutter, Mobile, Performance Comparison, React Native.*