Contribution ID: **18**   Type: **Poster**

Flutter vs. React for Web Applications: A Comparative Benchmark Study of Performance Metrics and Developer Experience

Thursday 24 April 2025 11:30 (30 minutes)

Rapid growth in device types used for running applications created a need for tools that allow cross-platform development.

This paper aims to benchmark multiple metrics, such as build size and speed index, to determine if Flutter is a good choice for writing web applications. Additionally, this research analyzes developer experience factors to provide a comprehensive evaluation beyond performance metrics alone.

Results of the performed benchmark show that React is better in most of the chosen metrics. The build sizes of Flutter applications are multiple times bigger, affecting the time needed to load initial chunks when the user first enters the website. Flutter architecture requires it to load its render engine so that the user can see content in the browser. These findings suggest that while Flutter offers the benefit of a unified codebase, its current performance limitations on the web can hinder its adoption for production-grade applications. Despite Flutter's comprehensive documentation, the web-specific guidance was noticeably less mature than React's extensive community resources and well-established best practices for web development.

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Session Classification: Session C (Poster)