

INTISARI

ANALISIS PENGARUH PARALELISASI GITHUB ACTIONS TERHADAP PERFORMA PENGUJIAN END-TO-END PADA SELENIUM DAN CYPRESS

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Pengujian *end-to-end* (E2E) merupakan komponen kritis dalam memastikan keandalan aplikasi *web* modern, terutama yang mengintegrasikan elemen *User Interface* (UI) dinamis seperti *React.js*. Tantangan utama terletak pada validasi interaksi dengan komponen dinamis, termasuk animasi *GSAP* dan respons terhadap *scroll*.

Meskipun berbagai *framework* E2E tersedia, literatur masih minim dalam menyajikan analisis komprehensif terkait performa, kemudahan implementasi, dan efisiensinya, khususnya dalam konteks integrasi *Continuous Integration* (CI) untuk pengujian UI dinamis. Selenium menunjukkan keterbatasan dalam menangani elemen UI yang dinamis secara *real-time*.

Penelitian ini melakukan evaluasi komparatif terhadap efektivitas Cypress dengan Selenium sebagai *framework* pengujian, dengan mengintegrasikan CI melalui GitHub Actions. Fokus analisis meliputi performa eksekusi (kecepatan, konsistensi, dan *throughput*) serta kemudahan pengembangan *script* untuk komponen dinamis seperti animasi *GSAP* dan interaksi *scroll*. Pemanfaatan GitHub Actions bertujuan untuk mempercepat proses pengujian sekaligus mengoptimalkan efisiensi *pipeline* CI/CD.

Hasil penelitian menunjukkan bahwa Cypress, terintegrasi dengan GitHub Actions, secara signifikan meningkatkan efisiensi dan reliabilitas pengujian komponen UI dinamis dibandingkan Selenium. Peningkatan ini mencakup kecepatan eksekusi, konsistensi hasil, dan optimalisasi sumber daya CI/CD, memperkuat argumen efektivitas pendekatan yang diusulkan.

Kata kunci : End-to-end Testing, UI Dinamis, React.js, GSAP, Selenium, Cypress, CI/CD, GitHub Actions, Performa Pengujian.

ABSTRACT

ANALYZING THE IMPACT OF GITHUB ACTIONS PARALLELIZATION ON END-TO-END TESTING PERFORMANCE USING SELENIUM AND CYPRESS

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End-to-end (E2E) testing is a critical component in ensuring the reliability of modern web applications, particularly those integrating dynamic User Interface (UI) elements such as React.js. The primary challenge lies in validating interactions with dynamic components, including GSAP animations and scroll-responsive behaviors.

Although various E2E frameworks are available, literature still lacks comprehensive analysis regarding their performance, implementation ease, and efficiency, especially in the context of Continuous Integration (CI) for dynamic UI testing. Selenium demonstrates limitations in handling real-time dynamic UI elements.

This study conducts a comparative evaluation of the effectiveness of Cypress versus Selenium as testing frameworks, integrating CI via GitHub Actions. The analysis focuses on execution performance (speed, consistency, and throughput) as well as the ease of developing scripts for dynamic components like GSAP animations and scroll interactions. The use of GitHub Actions aims to accelerate testing processes while optimizing CI/CD pipeline efficiency.

The results demonstrate that Cypress, when integrated with GitHub Actions, significantly improves testing efficiency and reliability for dynamic UI components compared to Selenium. This improvement encompasses execution speed, result consistency, and CI/CD resource optimization, strengthening the argument for the proposed approach's effectiveness.

Keywords : E2E testing, Dynamic UI, React.js, GSAP, Selenium, Cypress, CI/CD, GitHub Actions, Test performance