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AUTOMATED REGRESSION TESTING SYSTEM

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OVERVIEW

Problem

Regression testing is performed in every release cycle to ensure that new changes do not disrupt existing functionality. However, manual regression testing for large-scale and complex software systems is highly time-consuming and resource-intensive, often requiring multiple testers and several days to complete.

Solution

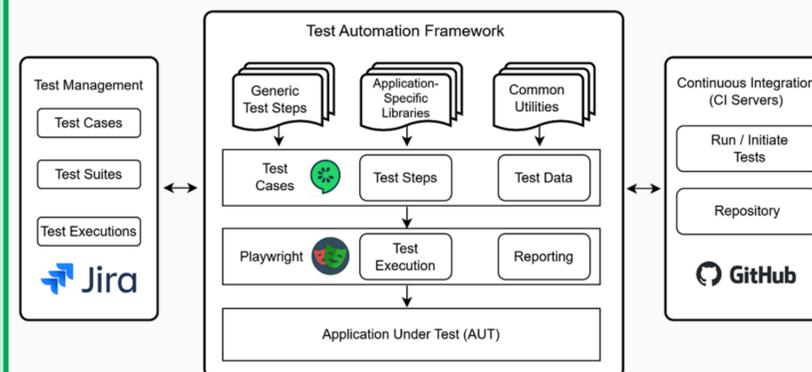
Develop an automated regression testing system that streamlines the testing process, reducing the time and effort required. The system also focuses on maintainability and scalability, ensuring its long-term usability and adaptability.

OBJECTIVES

- **User-friendly:** Enable non-technical users to be able to utilize the system effectively.
- **Maintainability:** A well-structured test case structure for easy maintenance.
- **Customizability & Reusability:** Accommodate diverse test requirements and allow users to reuse existing test steps.
- **Scalability:** accommodate new test cases and adapt to future application changes.
- **Accessibility:** Easy to run and integrates seamlessly with CI/CD pipelines.
- **Reporting Feature:** Automatically generates detailed reports.
- **Performance:** Delivers fast results even with a large volume of test cases.

METHODOLOGY

System Architecture

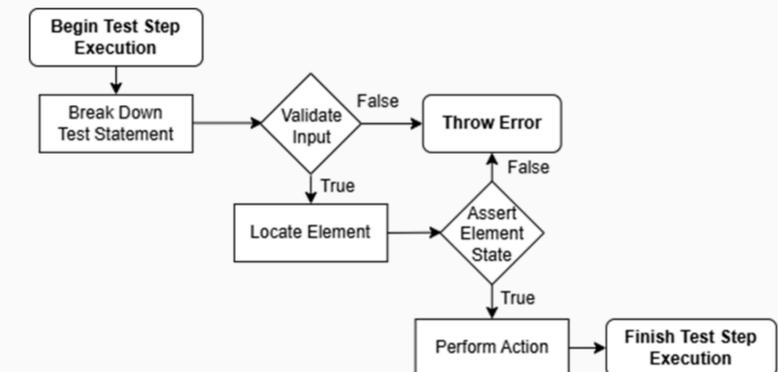


- **Test Management:**
 - Integrated with JIRA to manage and organize test cases, test suites, and test executions.
- **Test Automation Framework:**
 - Common Module which consists of Generic test steps, Application-specific libraries, and Common utilities.
 - Test cases follow the Behavior-Driven Development (BDD) approach and are written using Gherkin syntax.
 - Playwright used as the test runner.
- **Continuous Integration (CI):**
 - GitHub is used as the platform to host the codebase.
 - The system utilizes GitHub Actions as the CI/CD tool to facilitate the automation of the testing process.

Generic Test Steps

The generic test steps play a vital role in the framework as 95% of test steps in every test case will utilize these predefined statements. The purpose of the Generic Test Steps is to enhance reusability and simplify the process of writing test cases. This module focuses on two main functions which are locating elements on a webpage and interacting with them.

Flowchart of Generic Steps Operations



Transforming these generic test steps into web page interaction requires several operations working seamlessly behind the scenes. This process involves handling the statement, locating elements, asserting element states, and performing the action

Example of a Generic Test Step

```

When I click a button with 'class="btn", text="Confirm"
  
```

Action Type Element Type Locators

CONCLUSION

This project successfully developed an automated regression testing system that enhances the efficiency of the testing process by reducing the time and effort required. The system followed Behavior-Driven Development (BDD) approach by using Gherkin syntax. This approach ensured that both technical and non-technical user can easily utilize the system. Other key accomplishments include the implementation of common module that provides generic test steps, application-specific libraries, and common utilities. These components were essential to ensure that users can write test cases faster and easier. The automated testing system utilized playwright as the primary test runner. Playwright's ability to run tests in parallel and automatically generate a report makes it a suitable fit for this project. Furthermore, the integration with CI/CD pipeline, specifically GitHub Actions facilitates easy execution through the use of workflow. The workflow supported various type of inputs to help users run test cases according to their needs.

Since its deployment, this automated regression testing system has been actively used by the company for three months and has successfully covered over 100 test cases. Currently, this system is only used to support the regression testing for one application, but the team has expressed interest in further expanding the system to other applications in the future.