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ML Enabled Test Tool For Software Test Automation

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Abstract:

Current applications are complex and demand high quality release and deployments. They require rapid methods to get test results for making adequate decisions for production deployment. But minor lapses in the test script update as per the latest changes in application may seriously affect the overall automated test flow. It will add overhead to the Quality Assurance team and makes it difficult to provide required test metrics to management on time for decision making. Keen attention to skilled resources is always required and it is mandatory for smooth running of automated test flows in different levels.

The effective implementation of Artificial Intelligence and Machine learning is a way to make the testing effort more effective. It may speed up the Agile feature development and its deployments in several stages as well as in production.

Keywords: Automation Testing, Agile Methodology, Artificial Intelligence, Test-tool

Introduction to Agile Test Automation Approach

As per the recent survey result, major sharing of the present automation depends on few factors:

1. Test automation is dependent on skilled resources to develop, manage and maintain effective test scripts.
2. Minor changes in the application User Interface seriously affect the overall test execution and its results.
3. Test script updating and maintenance is a time consuming process. It requires regular updates and walkthrough.
4. Maintaining an additional test automation team creates more overall cost.

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5. Lack of skilled people may slow down the test automation activity prior to the sprint release.

6. Configuration overhead with multiple environments is a time-consuming challenge.

Expectations from an AI-based Test Automation Tool

Here are some of the expected features that a good AI-based testing tool should have:

1. Identify and understand the environment.
2. Cloud-based support with low cost.
3. Multi-platform support for wide range of test executions including web and mobile.
4. Generate Test cases and Test scripts automatically, with easy machine learning system.
5. Code less test automation.
6. Identify and auto correct the machine learned User Interface or element changes in the recurring test execution and report the auto corrected changes for further script enhancement and maintenance.

Objective of Artificial Intelligence Tool Implementation

The objective of AI tool implementation is not to replace manual testing, instead of using the possibility of Artificial Intelligence and Machine Learning to speedup testing and getting trustable Test result, on required time / demand.

AI Tools Available in the Market

There are several tools popping up and emerging to fulfil the new requirements of Artificial Intelligence in test automation space. Some of the tools are listed below:

1. Applitools Eyes
2. Mabl-
3. Test Rail (JIRA)
4. SauceLabs.

Implementation of Artificial Intelligence in Test Automation

Let us take an example of AI powered Test automation tool named "Mabl".

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How Does it Work?

Mabl, uses a sophisticated leaner tool named "Mabl trainer", a Chrome plugin, to train the tool about the test scenarios with input data and expected verification points.

As per Mabl terms, the work flow of the tool listed as below:

1. Create a new journey.
2. Train the new journey with test actions, verifications and expected results using "mabl trainer".
3. Save the Journey.
4. Run the tests to execute the trained steps.
5. Once the test execution is completed, user will get access to verify Test Results, Test history and Steps.

Auto-Healing Feature of Mabl.

Auto healing is the ability of a tool to understand changes in the application interface.

As per Mabl team, it does this change by collecting lots of information about each UI element. So if there is any changes like XPath, name, CSS, etc., the tool will be able to incrementally update what it knows about the element and then adapt in order to continue the test to completion.

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Literature Review

Author / Date	Topic/ Focus/ Question	Concept Theoretical / Model	Objectives	Findings
Gao, J., Tao C., Jie D., & Lu S. (2019, March)	What is AI Software Testing? and Why	AI Testing	1. "To study the AI software quality validation, including features, and process, and potential testing approaches. 2. To present a test process and a classification-based test modeling for AI classification function testing. 3. To discuss challenges, issues, and needs in AI software testing."	Software Testing can be achieved in effective manner using AI Techniques
Khanh Dam H., Tran T et.al. (2018, December)	Towards effective AI-powered agile project management	AI, Agile Project Management	"To propose a framework where AI technologies can be leveraged to offer support for managing agile projects, which have become increasingly popular in the industry"	AI will assist, not substitute, human teams. Individuals, interactions, and collaboration are still the key elements of project success. AI can serve as a distinctive accelerator for agile teams and thus help increase project success rates.

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Keith Rankin, MIT Technological Review (2017, April)	The Dark Secret at the Heart of AI https://www.technologyreview.com/s/604087/the-dark-secret-at-the-heart-of-ai/ Retrieved on 19.6.19	Deep Learning	White Paper	Developers can build the AI models but they don't know how they work
Tyagi, S., Sibal R., Suri B. (2017, April)	Adopting Test Automation on Agile Development Projects: A Grounded Theory Study of Indian Software Organizations	Software Test Automation, Agile Development Projects	1. "to create an understanding on different challenges faced by agile practitioners while adopting test automation on agile projects 2. to present some possible strategies to overcome those challenges. To provide more empirical insight in this area, a grounded theory study has been conducted that involved 38 agile practitioners from 18 different software organizations in India."	1. study investigated the test automation adoption from the specific perspective of agile practitioners through their real life project experiences using GT. 2. study can be utilized by agile software development teams to have a plan of action and streamline the test automation to get maximum benefits.

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PROPOSED MODEL FOR HYBRID TESTING TOOL

Objectives

a. To study the artificial intelligence techniques for software testing

b. To understand the Agile Project Management for Software Testing

c. To develop Test Case Design having ML features for various functionalities of software in Agile Projects

d. To develop a tool for execution of such test cases

e. To compare the results of executing the developed test cases on newly designed hybrid test tool with already existing automation testing tools in the market.

Methodology

1. Collecting data from company websites.

2. Contacting the company support system.

3. Java Tools may be used for development of Test Cases and Testing Tool

4. Language R may be used for training the data for inclusion of ML Capabilities into Test Case design.

5. Companies may be visited personally for collecting the test case data for real case testing.

As also mentioned above, following testing tools are available in the market for various kinds of testing functionalities:

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S. No.	Automated Testing Tool	Features	Types of Testing Covered
1	Applitools Eye	Applitools has 40+ SDKs for different programming languages and test runners, covering web apps, mobile apps, screenshot testing, PDF validations, and more.	Functional And Visual Testing
2	Mabl	Creating robust automated tests is codeless and scriptless. Testing infrastructure is fully managed in the cloud. Scale tests infinitely and run them all in parallel. Auto-healing tests adapt to UI changes without intervention.	Script-less cross-browser testing, auto-healing tests, visual testing, and diagnostics in one simple service.
3	Sauce Labs	Sauce Labs has lots of great resources to help you get up and running with your web and mobile application testing.	Web Application Tests, Mobile Application Tests
4	TestRail (JIRA)	Advanced artificial intelligence techniques running on a map/reduce architecture	Company contacted for detailed information
5	Hybrid (Proposed) Testing Tool	All above features & others	All above features & others

A model with all the capabilities of the present day software testing tools is being proposed.

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LIMITATIONS OF THE STUDY

- Deployment of a 100% fully automated testing is not possible – The test scripts are written by a human, there is only a limit to how far-sighted one can be. It doesn't matter how tremendous testers are working, they can't predict all the possible test cases required to call a software 100% bug-free.
- Just Recording and Playback will not always help – Many automation tool vendors advertise mentioning to just record and playback for automating the testing process through their tool. But that isn't true. The real automation starts after the playback once you have the idea regarding the test script being generated by the tool.
- Automation Testing will never be going to substitute Manual Testing – Since a 100% automation is impossible, manual testing will always be irreplaceable. The point of automation testing is to allow testers the time to look for loopholes in the system manually and think of better test cases. Manual testing can never be trivialized and will always prevail.

FUTURE SCOPE

The idea of integrating features in the proposed hybrid software tool which can even provide comparative analysis of software test results for every tool available in the market. And showcasing the best test tool out of the available against the exact type of testing may be incorporated in near future.

REFERENCES/WEBLINKS

1. https://www.joecolantonio.com/mabl-ai-machine-learning-test-automation/

2. https://www.joecolantonio.com/mabl-ai-machine-learning-test-automation/

3. https://stackshare.io/mabl

4. https://www.capterra.com/p/175029/mabl/

5.https://eyes.applitools.com/app/test-results/?accountId=tBCKanMkwEGJ30VXHgfTXA~~

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6. https://www.guru99.com/automated-testing-tools.html

7. https://www.guru99.com/testing-tools.html#3

8. https://www.infoq.com/articles/layered-test-automatation/

9. https://www.guru99.com/test-case.html

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