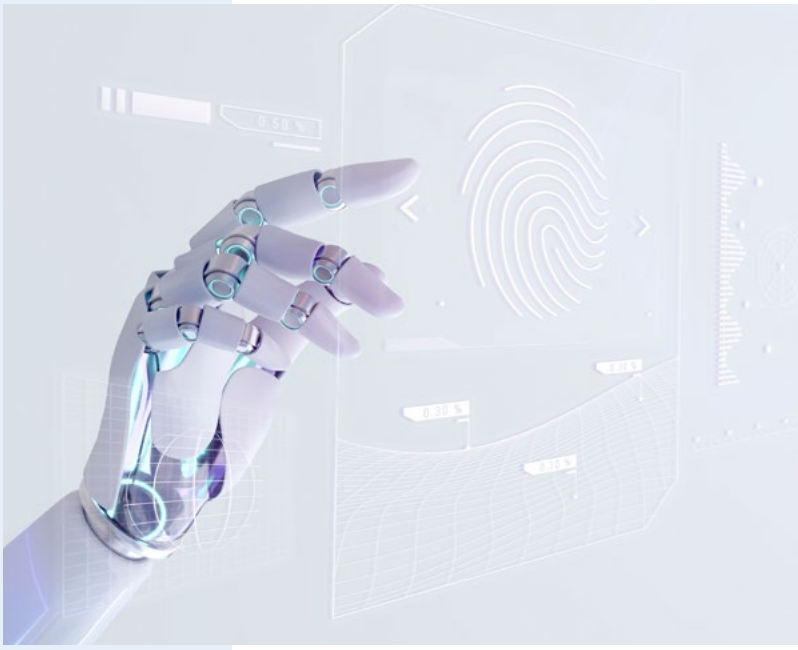
HYPERAUTOMATION TESTING

Fast-paced development has become the new norm, and it is paramount to ensure quality throughout the agile development process. Testing teams are often in a tight spot to complete testing within a short time frame. Moreover, many testing organizations are struggling to adapt their game plan to support new-age technologies. In this document, we explore Hyperautomation testing, and how it could enable Quality teams to utilize and implement state-of-the-art automation.

REPLY VALOREM

Introduction

As the adoption of Agile and DevOps became widespread practice across the software industry, it became inevitable to increase the scale of test automation in projects to ensure comprehensive testing is provided within the project timeline. Every successful organization has developed its approach and framework for test automation to obtain a competitive advantage with speed to market. There is a high probability that the speed to market factor will further reduce the time available for testing as we move forward and would in turn create the requirement for more automation. However, it is a widely accepted fact that 100% automation isn't achievable.



As per the 2020-21 World Quality Report, only a third of respondents (37%) felt they were getting good ROI from automation. There are multiple factors for this, but the major reasons are:

- Rapidly changing dynamic applications
- Challenges to invest in automation in short-term projects
- Difficulty to automate AI-based applications
- Absence of an inclusive automation approach

There are multiple root causes for all these problems. A common thread that connects these problems is the overarching automation approach followed in the industry. Traditionally, many companies have relied on one automation tool as a silver bullet to address all the automation requirements. While there are advantages with this approach, the above-mentioned scenarios proved to be extremely challenging to manage for many such organizations. Some businesses have deployed a network of automation tools in their test environment to achieve maximum automation coverage. However, over the period, it has become so complex that the integration and execution of these tools negated the profits gained from automation.

What is Hyperautomation

Gartner named Hyperautomation as one of the top 10 strategic technology trends for 2021. Gartner defined Hyperautomation as a business-driven, disciplined approach that organizations use to rapidly identify, vet, and automate as many business and IT processes as possible. Hyperautomation involves the orchestrated use of multiple technologies, tools, or platforms, including:

- Artificial intelligence (AI)
- Machine learning
- Event-driven software architecture
- Robotic process automation (RPA)
- Business process management (BPM) and intelligent business process management suites (iBPMS)
- Integration platform as a service (iPaaS)
- Low-code/no-code tools
- Packaged software
- Other types of decision, process, and task automation tools

Hyperautomation Testing

Hyperautomation envisions the automation of anything that can be automated. Hyperautomation testing is achieved through synergy between UI/API test automation, RPA, digital business process automation (DPA), AI/ML, and low code automation. It helps to accelerate digital transformation with a more effective and efficient quality process based on the blend of best-in-class automation technologies which complement each other instead of complex and baffling integration of conventional methodologies and tools. Hyperautomation is not intended to replace manual testing. Its goal is to aid the smart quality assurance process by helping quality analysts quickly automate redundant test processes without in-depth technical skills and focus on exploratory testing to uncover underlying functional bugs. Thus, Hyperautomation helps to socialize and democratize the test automation process by enabling quality analysts to do test automation along with quality engineers to increase the overall automation test coverage by bridging the gap in their skill set to create a win-win scenario. This would help testing organizations to quickly adapt to rapidly changing market demands by supplying intelligent automation services.

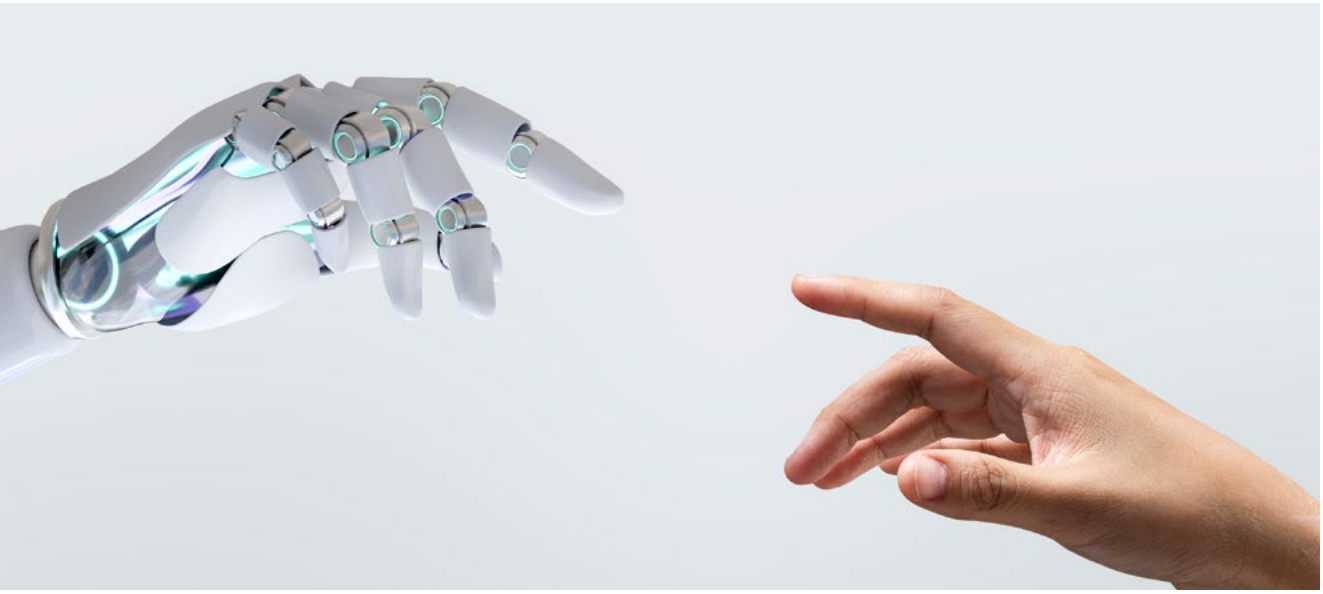
Our Approach

Valorem Reply is a trusted Microsoft Gold Partner. Our knowledge and expertise on Microsoft technologies help us to embrace cutting-edge Microsoft tools for continuous improvement. Microsoft Power Automate is one such tool that helps businesses to automate repetitive processes quickly to create streamlined automation flows. Even though the primary intended purpose of this tool might not be testing, it has all the required capabilities to support test automation. It also has in-built DPA, RPA and AI capabilities.

Our quality engineering team has developed an in-house Selenium-based hybrid test automation framework that supports UI and API automation. Its capabilities to integrate with Azure, configuration options to connect with CI/CD pipeline, generation of reports with Azure DevOps dashboard, and the support for BDD/Specflow make it a robust solution.

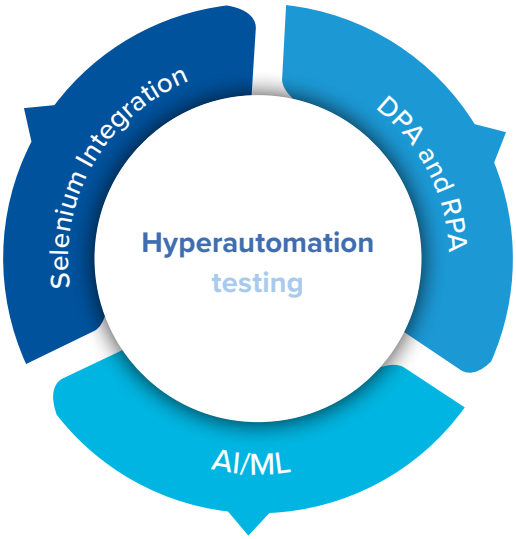
Hyperautomation strategy uses our in-house Selenium-based automation framework and Microsoft Power Automate. It brings the best of both worlds together.

Category	Valorem Test Automation Framework	Microsoft Power Automate
Skill	Requires programming and supports integration of APIs and UI components	Capable to support UI and API tests with low code automation
Execution	Ability to execute program instructions to automate tests starting from the data layer	Ability to mimic user actions to automate even user acceptance tests
Legacy Apps	Traditional Legacy applications are not designed and built for integration and do not have robust APIs.	Power Automate Desktop has the capability to automate legacy applications
Domain Knowledge	Typically, quality analysts define the test scenarios prior to automation	Requires strong process and domain knowledge
Time and Cost	High initial investment related to feasibility, planning and design. However, it is based on open-source technology	Easy to kickstart with minimal investment. Even though it is paid subscription, the benefits outweigh the license cost
Scalability	Flexibility to achieve parallel execution with physical and virtual machines	Capability to run hundreds of bots on virtual machines to achieve parallel execution
Maintenance	App functionality changes could result in high maintenance of scripts even though it can be managed up to an extent with auto-healing features	Easy to update and maintain automation flows to accommodate changes to business rules
Security	Ability to use Azure security features like key Vault to keep the confidential data for test runs from the pipeline. However, accessing Azure key vaults from local machines involves time consuming complex encoding/decoding techniques. So many organizations tend keep all confidential test data in a separate file when running tests from the local machine which results in low security.	Environment security, Microsoft Dataverse security features and capability to use Azure security features like key Vault to safeguard keys and secrets.



The capabilities which make Microsoft Power Automate a unique solution to enable Hyperautomation testing can be summarized into three broad categories.

- Power Automate Desktop features direct integration with Selenium IDE
- Customizable test scripts



- Ability to automate legacy and modern apps
- Low-code attended and unattended flows supporting UI and API tests

- Leverage prebuilt, custom AI models and develop our own ML models with Lobe
- Object detection, entity extraction, prediction and classification for management of structured and unstructured test data

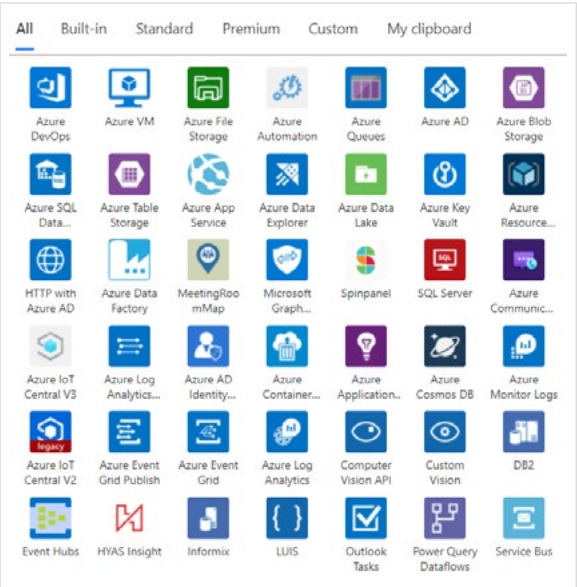
Use Cases

We have outlined three instances where Power Automate can be used for testing as a standalone tool or along with Selenium to reduce the time it takes to develop these complex models.

Azure Integration

1

Power Automate has built-in connectors and operations access to Azure features and integrate with apps, data, services. If we have an active Azure subscription and Power Automate license, we can manage and utilize with help of Azure actions in power automate desktop too. For instance, using the connector for Azure Resource Manager, we can list, read, create, update, cancel, delete the resources, resource groups, template deployment, and subscriptions, etc. directly from the flows. It is possible to achieve this in Selenium too, but it requires complex programming and custom packages, while Power Automate lets the user do this with minimal effort. We can implement Azure integration and other Power Automate features in tests using Azure Logic Apps too which would also offer support for complex integration solutions and development tools.



Web Data Extraction

2

Power Automate offers a couple of great options for screen scraping. The first method is using Desktop Flows (previously called UI Flows) in Power Automate Cloud to scrape data from web pages. Another technique is to use Power Automate Desktop to easily extract data from specific parts of a web page in the form of single values, lists, rows, tables, and store those easily in spreadsheets to use them for comparison. By using the native OCR engine, we can quickly extract text from a given image. We can do this using Selenium too, but the effort will be minimum when we use Power automate compared to selenium.

Cognitive Services

3

Power automate desktop allows us to use all the cognitive services by using Microsoft cognitive service, google cloud platform, and IBM cloud. Even without any expertise in machine learning, Microsoft cognitive services enable users to accelerate decision-making using artificial intelligence. We can use AI builder or pre-built AI models to include text analysis, sentiment analysis, computer vision, and data extraction in our automation tests by using Microsoft cognitive actions. If we try to implement the cognitive validation using Selenium, multiple packages and complex coding logic would be required. Instead, can even integrate our Selenium tests with Power Automate to use its AI capabilities.

Conclusion

As we navigate through the era where every organization is on its journey to adopt and integrate Artificial Intelligence and Machine Learning, it is imperative to have an omnichannel approach for test automation to ensure all-inclusiveness to develop the technical competence to support the testing of apps with AI/ML capabilities. Hyperautomation helps testing departments develop a flexible digital framework for testing to confirm the quality of modern and legacy apps. Regardless of where you are in the digital transformation journey of your quality services, our testing team can partner with you to help achieve its true potential to meet the internal and industry quality standards with our expertise and experience in Hyperautomation testing.

Authors

Deepthi K
QA Engineer
Enterprise Technology

Jaison K J
Testing Manager
Enterprise Technology

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