Integrated Test Automation Solution for successful Digital Transformation

– In Banks and Financial Institutions

Practice Head:
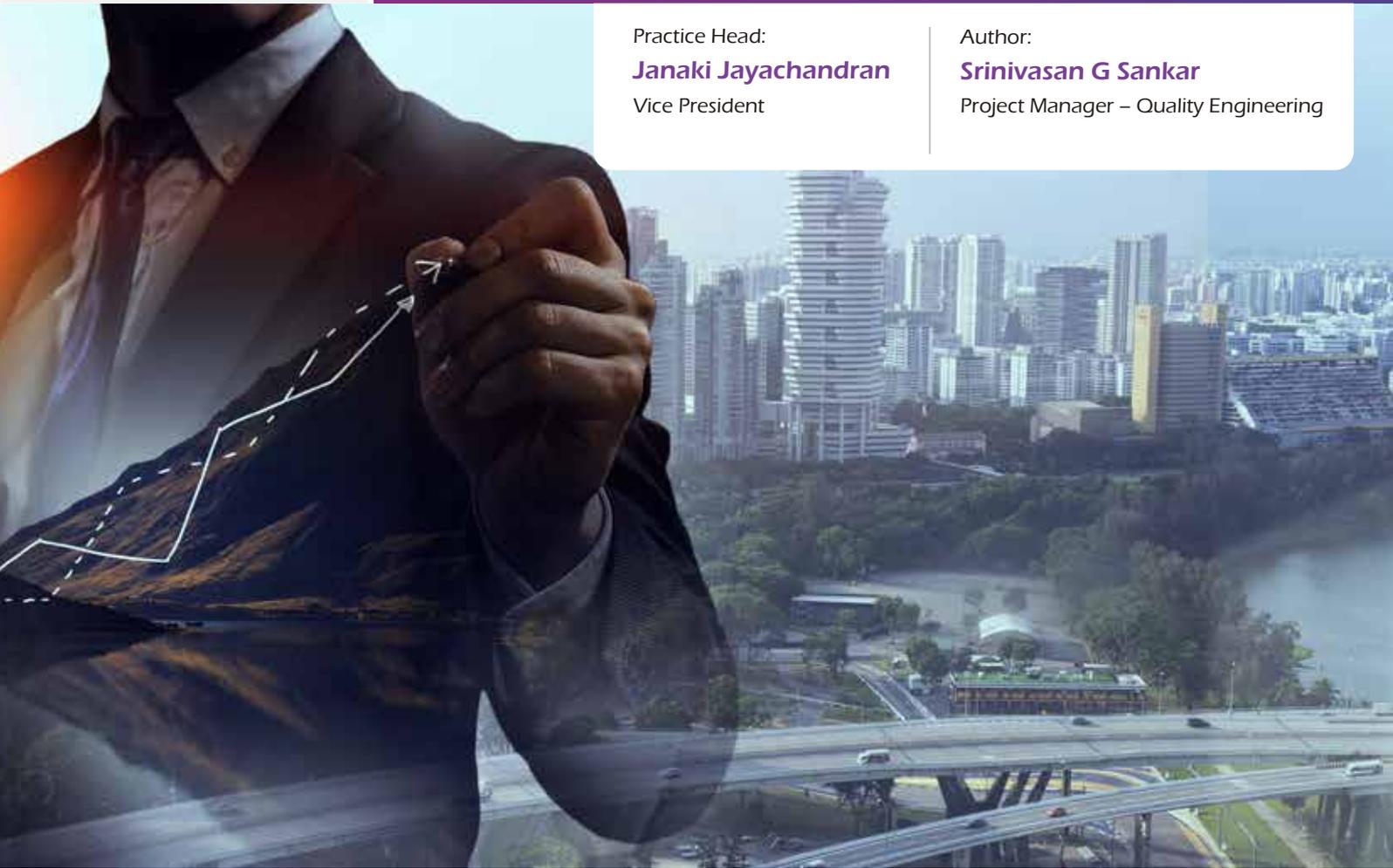**Janaki Jayachandran**
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"Banking is necessary, banks are not" – When Bill Gates said this in 1994, not many people agreed with him. But with each passing year, we see that this statement is becoming more and more relevant. With the decoupling of banking services happening at a rapid pace, banks are no longer competing with other banks; but rather their competition is now with technology players.

Interestingly enough, the banking and financial industry has always been at the forefront of adopting technological innovations that help deliver better services to their customers. ATMs, Core banking facilities, Cash cards etc., have been the great enablers in the 70s, 80s and the 90s. The last 10 years have seen an explosion in Social, Mobile, Analytics and Cloud (SMAC) technology stack and the customer adoption of these technologies have pushed boundaries for banks to redefine their offerings as well.

With the advent of the millennials, generation Z and their exposure to digital technologies, it only puts further onus on the banks and financial institutions to innovate and upscale their offerings to deliver seamless banking services, anywhere anytime. So are their IT departments who need to be able to upscale their testing strategy to be relevant and effective.

Digital transformation projects for banks and financial institutions have quite a few critical success factors. And it also involves a higher risk of failure if not implemented with a well-tested system.

Ranging from complex integrations, usability, to business performance & reliability, digital transformation projects do throw up quite a few challenges for testing.

Some of the challenges include

Complex Integrations:

Quite often we see architecture rewrite as being a major part of digital transformation projects where microservices architectures rule the roost and a lot of services are becoming loosely coupled (think open banking APIs) to be able to feed third parties to offer better services to end customers. Also these projects often involve integrating with existing core banking systems, payment systems, decisioning systems for loans, and a host of other systems. This only adds to the nightmare of providing a seamless experience for end users. Testing such integrations at the product level as well as at the service level becomes absolutely imperative in transformation projects.

Usability:

A defect free experience where the user is able to perform expected actions with no hand-holding and with ease is just a baseline for any application that is exposed to the end user. But targeting just the baseline is not a good strategy to compete in the cut-throat competitive market. The general public has now been accustomed to using beautifully created websites in UI frameworks such as Bootstrap and anything less than this will be

considered regressive. Especially the internet banking portals need to provide an intuitive navigation experience. And the user of today accesses the applications from a host of devices including the personal computer or a cellphone and the experience has to be consistent and seamless across these devices. Any application that combines quality with usability can most definitely throw its hat in the ring.

Availability:

Have you sat back and thought about the list of banking services that are now available outside the working hours of the banks? Account opening, cash withdrawal, check deposits, fund transfers, payments, statements, and a host of service requests are now available for customers anywhere anytime. While keeping the applications up and running 24/7 is something that everyone can do, the challenge in keeping them up during expected and unexpected traffic surges is something be tackled if the banks want to be in the fray.

Security:

The mantra ought to be "build it secure". Quite often in transformation projects we do see that security testing is reserved towards the end of the project. If you're on an agile model, iterating and pushing to deliver new features every few weeks, this doesn't help. Security has to be built in and validated for all sprints and releases. One security lapse and the banks can lose their customers forever. Focus on security is absolutely non-negotiable.

Time to market:

Time to market can be a game changer in every industry there is and banks are no exception. The push to launch the minimum viable product and then iterate and build on top of it is how the startups roll out their product features and to stay relevant, banks are required to do that as well. With new trends in technology happening at break-neck speeds, integrating them into the service offering mix to provide superior customer experience becomes unavoidable. And to be able to do this, the time to test has to be within reasonable limits while ensuring good test coverage to ensure quality.

It is quite apparent that there is a lot to be focussed upon in the present scheme of things from a quality perspective. However time is a luxury and the objective is to maximize testing within whatever little time the testing team has before the product/feature is rolled out. It is quite obvious that automation is a necessity here. However, traditional test automation has been focussing only on the functional and regression testing and this is going to be effective only to a certain extent and certainly not going to help in digital transformation projects.

It is therefore crucial for banks today to invest in the right test automation strategy. The strategy should be wholesome, technologically relevant, scalable, adaptable, and easy to maintain all at once, while keeping costs low and ensuring high quality of testing.

While addressing the automation challenges at application level, it is imperative that the framework should raise the bar to enable process automation as well. Towards this end, the goal of the test automation framework should be to support non-functional testing and continuous integration/ process on top offering cross platform and scripting language independence. With mobile testing gaining importance and offering more complexities, it is essential that the frameworks being developed are scalable to address innate challenges of mobile testing such as device fragmentation, multi O/S testing etc., as well

AFTA for Banks - Aspire Framework for Test Automation

The selenium test automation framework solution that we have built at Aspire was designed with the aim of addressing the challenges and objectives discussed above. This framework not just stops at functional / regression test automation, it also extends beyond to leverage the same

scripts for API/Webservices, security & performance testing as well. On top of this, the framework combines the power of reusable functions specific to banking features such as KYC, Customer Onboarding, Account Opening, Loans, Deposits, Payments, Transfers, Robo Advisory, Service Requests etc.

Framework Architecture

The framework exploits Selenium Web Driver, Appium & Grid to its fullest on various parameters – Design patterns, parallel / distributed / cloud / cross browser / device execution, custom report, CI, API, web security & performance.

It is based on highly maintainable & scalable design patterns using Page Object Model, Page Factory & Loadable components. This greatly reduces the boilerplate code in tests.

Parallel / Distributed execution is taken to the next level by exploiting TestNG and Selenium Grid. This significantly brings down the turnaround time of script execution & infrastructure cost to 1/5th or 1/10th of sequential executions. It also encompasses necessary components to run the same scripts in cloud browser & mobile infrastructures platforms like sauce labs, cross browser testing, etc

Non Functional Tests using AFTA

OWASP ZAP Integration with Selenium

AFTA has a seamless integration with OWASP ZAP tool for uncovering vulnerabilities in web applications. Spider Scan and Active Scan are effectively used here to perform vulnerability assessment along with functional automation scripts that helps to unearth many of the Top 10 Security vulnerabilities without any significant additional effort. This is especially useful for 'on the web' applications such as Internet Banking portals, Robo Advisory platforms etc.

SOAP Scripts Integrated with Selenium Scripts

With easy integration with SoapUI, one can perform functional, regression and load testing. SoapUI works on xml where the request is sent through xml and a server response is obtained. With Selenium integration of SoapUI, it is very easy to create different test suites and test cases with different data and use them to perform web services testing. Additionally, since SoapUI interacts with server without the need for an UI, AFTA can use SoapUI for faster test data generation.

JMeter for Performance Testing:

The test scripts within AFTA can be converted into executable jar and can run the same test from JMeter with required parameters / data and AFTA provides with a custom sampler to select & run the same test from JMeter

With this enablement, simulating multiple requests and validating the application load is made easier. Also, Java based implementation and execution provides flexibility for any further integration with other tools (like Dynatrace)

Continuous Integration

Integration of test automation into Continuous Integration tools has proven to be the silver bullet solution for ensuring quality in frequent code deploys in digital transformation projects.

The AFTA for Banks framework offers seamless integration with CI tools like Jenkins, Bamboo, MS Build and the selected automation scripts are triggered as and when a new build is committed to the version control tool.

With continuous integration, much more effective usage of the test automation framework is achieved and the return on investment is achieved faster as well. Other benefits include:

- Early defect detection by shifting left the testing cycle

- Improved application stability

- Enhanced test coverage

- Reduced test cycles resulting in cost savings

- Improved resource utilization and productivity

- Less piling up of defects

- Drive testing on par with the pace of development and delivery

Conclusion

DBS launched the DigiBank with seamless integration to the govt ID authentication systems with no paperwork, an intuitive UI and early time to market. It was a resounding success with over 1 million customers signing up in India alone. Gone are the days when separate teams worked on functional test strategies and non-functional test strategies and everyone focussed on their isolated pieces of work. The key to success for digital transformation projects lie in viewing the end product from the perspective of the user. The product has to be intuitive, easy to use, seamless integrations to third party systems, consistent experience across devices, 24/7 availability and of course being defect free. Hence the testing strategy has to be able to complement this with a whole-some approach as well. Usage of test automation to support this combined testing strategy will have to be the baseline of all testing projects in the digital transformation testing space.

ATTENTION. ALWAYS.

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