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SHIFT-LEFT TESTING WITHIN FINANCIAL SERVICES

One of the main outcomes of implementing DevOps practices in an organization is to provide a fast, safe and low risk way of introducing product and service changes that add business value quickly. To be successful with this outcome, DevOps introduces shift-left test automation as part of the continuous testing paradigm. Shift-left allows us to rationalise the software lifecycle process by providing a set of controls that deliver products with the right quality and security as well as providing a set of observability practices to proactively study the product and the service to identify and fix issues rapidly, so we can provide the best customer experience.

In this article, we cover some of the software testing challenges in the financial services industry, what shift-left testing is, its benefits and how it can be achieved in practice.

SOFTWARE TESTING CHALLENGES IN FINANCIAL SERVICES

Dated practices

In the financial services industry, although most organisations have moved to agile ways of working, development teams still follow the waterfall approach when it comes to testing and releasing software into production. This means that testers are introduced to new features very late in the cycle, once all development is finished and handed over to the test team to test within a short timeframe, with the additional pressure of signing off to meet the deadline for releasing the software.

This results in defects being found too late in the cycle or slipping into production, thus compromising the quality of the software or delaying speed to market.

Three amigos not working together

Our experience confirms that typically the business analysts/product owners, developers and testers work in silos. This can create gaps in understanding of the requirements from all possible scenarios, resulting in missing requirements. Further, not being aware of the impact of change 'breaks' the end-to-end functionality and blocks the related systems and teams. Compounding matters, quality is often considered as only the testers' responsibility, while in fact all teams need to have the quality assurance (QA) mindset.

Environment unavailability and disjointed processes

Test environment is often down due to untested, breaking changes being 'pushed' to the system integrated test (SIT) environment. This adds to the lateness in performing the testing, finding critical issues and fixing them and may also introduce regression issues.

The above challenges have a huge impact on software testing practices in organisations, making it difficult to introduce new ways of working, such as test automation.

Another issue is that test automation of new features is often done as a follow-up activity after the code is marked as "Done" and is carried out by a separate team of automation testers who do not have the necessary in-depth understanding of the application. As a result, a continuous catch-up is needed on the automation side, which causes gaps in the test coverage. Ultimately, automated testing fails to make a significant impact on the quality of software.

WHAT IS SHIFT-LEFT TESTING?

Shift-left testing is a testing approach which focuses on testing as early as possible in the development cycle and as often as possible. It is based on performing all the necessary quality due diligence through the development of automated tests in parallel with the feature development, in an agile manner in developers and testers development environments (laptops).

This results in increased flexibility to fix issues identified early in the process and helps set the definition of 'done' to not only the feature being developed and deployed, but also having the right level of quality associated within the feature, all with a view of ultimately improving speed to market, efficiency, and delivering higher quality products.

HOW SHIFT-LEFT TESTING CAN BE ACHIEVED

Mindset shift

Based on our project experience at various financial services clients, to change the ways of working or introduce new ways of working, it is critical to start with changing the mindset within both the development teams and senior management.

QA mindset is one where quality is considered everyone's responsibility. With that mindset, the 'three amigos' - business analysts/product owners, developers and testers – can work to test early and often.

Feature level testing

In order to test early, it is imperative to introduce feature level testing. With this approach, testing begins from the inception of a feature, even before the development work has started. The process begins with the three amigos (BA/PO, Dev, Test) jointly reviewing requirements and acceptance criteria and with testers

identifying possible scenarios and sharing them with the group. While development is in progress, testers can initiate prep work including identifying test data preparation and start writing cucumber scenarios for the feature that is being worked on. Once the development is done, developer and tester can pair to test on a local development branch and perform the initial review of the code. With the help of Docker, testers can set up their localhost as the first test environment on demand and can perform manual as well as automated testing at feature level.

Process improvements

In addition, to implement agile principles in action, a number of process improvements can be introduced such as clear definitions of 'ready' and 'done' within teams and frequent small, granular changes (rather than feature-wide changes). Definition of done should include test automation, all critical and major issues fixed and retested, regression is passing, pipeline is green and ticket is deployed in production.

BENEFITS OF SHIFT-LEFT TESTING

So, what are the key benefits of shift-left testing and why should financial services invest the necessary time and effort to get it right? Shift-left testing can help organisations with the following:

- Finding out any bugs at the feature level where it can be fixed fast - it is cost effective and time saving vs finding bugs further down the development lifecycle or in production.
- Test automation can be done as the new feature is developed and not as a follow-up activity, thus helping catch regression issues faster and in turn produce stable builds.
- Test automation can be run locally including the full regression suite, which can find any potential system integration issues upfront, ensuring that only tested and working code is deployed to SIT environment and that the SIT environment is always stable and available.
- Full regression test suite can be run on SIT, which helps achieve higher quality of software as well as giving confidence in meeting the delivery timelines.

By achieving feature level testing as well as running full regression suit on SIT environment, testers can focus on edge cases and exploratory scenarios and on end-to-end scenarios when the new feature is deployed to SIT environment. With this approach, teams can deploy working code to SIT environment, achieving higher stability, faster time to market and cost savings.

As the teams' practices mature, functional as well as non-functional (such as performance testing) can be performed at feature level. With this approach, even performance issues can be found at an early stage (at feature level and not late as traditionally done at UAT level).

At the team level, shift-left testing improves the communication and collaboration between team members, which helps in overcoming silos. It also addresses the skills gap through collaboration and pair programming within the team, which is the best way for people to upskill.



HOW CAPCO CAN HELP

With our proven experience of working with highly complex systems and in challenging conditions, combined with expertise in DevOps and test automation, Capco's quality engineering acceleration approach focuses on providing tangible working software along with team coaching and mentoring. Our experts can support you with:

- Building the appropriate development ecosystem with the help of DevOps best practises to enable feature level testing.
- Implementing best in class test automation frameworks that can be used right from the feature level to UAT with features such as local testing, Behaviour Driven Development (BDD), best in class reporting, cloud testing, etc.
- Mentoring team members and pair programming at each stage to help through the transition process and address the skills gap.
- Implementing process improvements based on agile principles and our agile delivery expertise.

We have helped our clients achieve improved production quality and speed to market, resulting in stable, reliable and highly performant products. In addition, with our support clients achieve increased confidence in the product, greater customer satisfaction, reduced cost of operations and 'quality consciousness' in employees.

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ABOUT CAPCO

Capco, a Wipro company, is a global technology and management consultancy specializing in driving digital transformation in the financial services industry. With a growing client portfolio comprising of over 100 global organizations, Capco operates at the intersection of business and technology by combining innovative thinking with unrivalled industry knowledge to deliver end-to-end data-driven solutions and fast-track digital initiatives for banking and payments, capital markets, wealth and asset management, insurance, and the energy sector. Capco's cutting-edge ingenuity is brought to life through its Innovation Labs and award-winning Be Yourself At Work culture and diverse talent.

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