CTO's Guide: Why 'Shift-left' Testing can accelerate your releases

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Have you ever worked on or lead a software project that was over budget or under time constraints? Most likely, you did. Contrary to popular belief, poor planning isn't always to blame when a project runs over its deadline. The project's code validation process is where the true issue is. In other words, software testing is the key to it all. Or, more particularly, to software testing that is carried out insufficiently often and at a late stage in the project. Shift left testing is a suggested remedy for this issue.

What is Shift Left Testing?

Shift Left testing is an approach that involves moving the tasks related to testing earlier in the development process. This means that testing tasks that are traditionally done at a later stage of the operations should instead be performed at earlier stages-particularly those related to API testing.

The Shift-left approach focusses on:

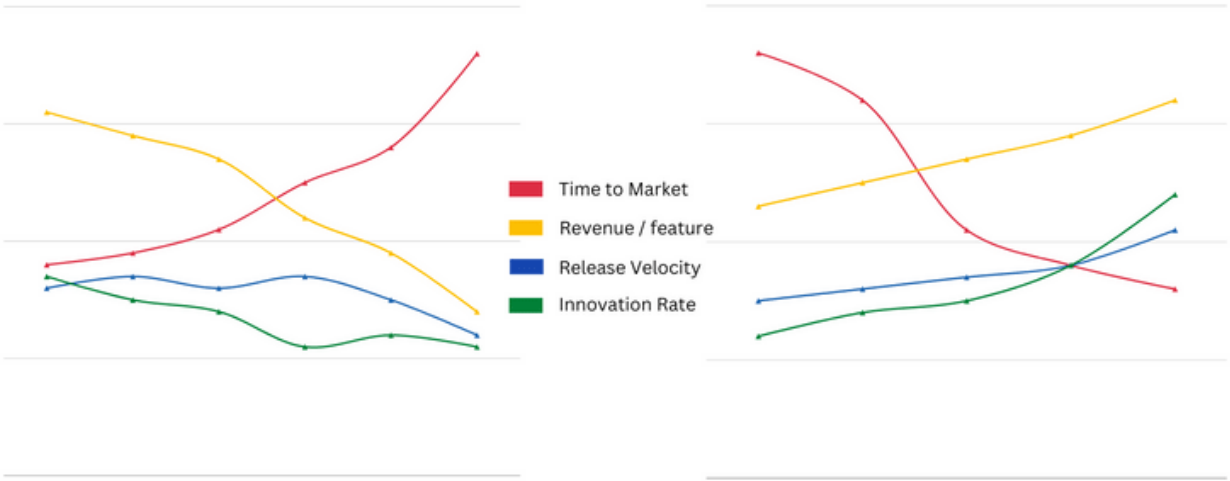
- Non-UI smaller, more atomic tests that tests output of the system under test (SUT), with defined inputs
- Shift-left testing approach provides very quick and extremely precise feedback for developers on breaking changes, that devs can debug quickly, fix and release patches
- The kind of tests that usually cover shift-left approach are unit or integration tests but never E2E tests
- These tests should cover functional as well as logical issues

Why is it required?

- Traditional models place testing closer to the deployment phase. This creates a bottleneck in the release process because it accumulates too many changes to be tested together, that slows down testing and in turn releases.
- Shift left principles enable testing teams to increase developer oversight on the change they release by helping them test their changes as soon as they are merge-ready, without involving QA teams altogether
- Shift left testing process runs parallel to the development process, and gives developers the ability to make small changes to the application that can be tested quickly and made ready for release immediately

Which is better?

Shift-left testing vs E2E testing



Without Shift Left Testing

With Shift Left Testing

There has been a constant debate on nailing down on the best way of testing. While we can't make that choice for you, here are a few quick comparisons:

- 'Shift-left testing' by virtue of testing smaller commits tests user contracts, testing the output of the application (or service) with available inputs, hence runs faster and gives quick feedback to developers
- In contrast, E2E testing follows the 'shift-right' testing approach aims to test the entire user story closer to the deployment process, that might involve testing several components of the application together, making it slower and possibly catching issues very late in the SDLC cycle
- Waiting to test during production means the team is always playing catch up and fighting inherently greater risk
- So with the 'shift-left' approach teams can catch issues faster, and much early in the development and design cycle making it much easier to patch and release vs E2E approach that catches issues, if any, much late, taking it longer for devs to fix, slowing down releases and the entire SDLC cycle

Value of shift-left testing

For development teams, moving testing earlier in the process has a wealth of advantages. Two unique outcomes—faster innovation and reduced time to market for new features can be used to describe these advantages. Here are a few more:

- **Automation** - Testing can be automated more effectively by shifting to the left. Some important advantages of test automation are:
  - Considerably fewer human errors
  - More thorough test coverage (conducting multiple tests concurrently)
  - Capacity for testers to concentrate on more important activities
  - Less problems in production
- **Faster Innovation** - Early API testing also allows you to increase code sanity without slowing down development. Continuous testing can lower the expenses associated with duplicate testing while increasing your organisation's confidence in APIs.
- **Delivery Velocity** - In this case, faster is also earlier. Defects are much easier to rectify when discovered early in the production cycle. The result - The interval between releases may shorten dramatically and the software gets better in quality.
- **Lower Costs & Higher revenue** - Early and frequent API testing greatly lowers remediation costs since flaws can be fixed before they pose a risk to the company in production. By assuring that new releases are bug free and unlikely to need rework in the future, automated testing enables developers to move fast to fulfil the needs of customers.
- **Increased Satisfaction** - One of the main advantages of the shift-left strategy is faster delivery of software with fewer flaws. Products can keep their competitive edge or increase a competitive lead in the market because they can meet client expectations and hence deliver outstanding customer experiences.

How to make it happen?

If you have a micro-services architecture, a shift-left testing approach becomes by default the best testing approach and something you can easily put in place. Your team has done the hard work in splitting your central code base into several smaller, distributed code-bases to accelerate development. All that you now need to do is adopt a testing practice that can test these code-bases independently. Since changes are committed one service at a time, a shift-left approach tests these commits one at a time, independent of the dependent services or alongside them, but providing quick bit-sized feedback on what can be fixed immediately.

The quickest way to start with shift-lest testing is to have continuous integration (CI) tools be part of your release pipelines. With the help of CI, it would be possible to automatically trigger integration tests and run it on very commit or pull request. If CI tools can automate running tests, what if developers can see the test results inside the tool that they use to merge new commits? Think version control systems like Github, Gitlab, Bitbucket or others. Like how teams do code-review, if the results of the integration tests are available inside VCS, devs get quick feedback on changes and their side-effects, and can move much cleaner builds to the next stage. Issue tracking tools like Jira can also help log issues and track timelines.

Shift left testing, in summary, enables teams to develop more quickly and find & fix vulnerabilities prior to production. Since it is integrated into every stage of the DevOps process, it guarantees that developers can keep an eye out for vulnerabilities at all time through the lifecycle.

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