

Automation Testing

GROWTH DRIVERS, CHALLENGES & THE ROAD AHEAD



Overview

Testing is a crucial part of any software development cycle. Software testing improves accuracy and ensures the quality of the end product and can either be manual or automated. These tests need to be conducted frequently during the development cycles, typically every time the source code is modified or a new version of the software is released.

However, manually repeating the tests is time-consuming, costly, and error-prone. Now, that's where automation testing comes into the picture – it is faster, cost-effective, provides accurate results, and eases the workload of the developer team.



Automated QA Testing

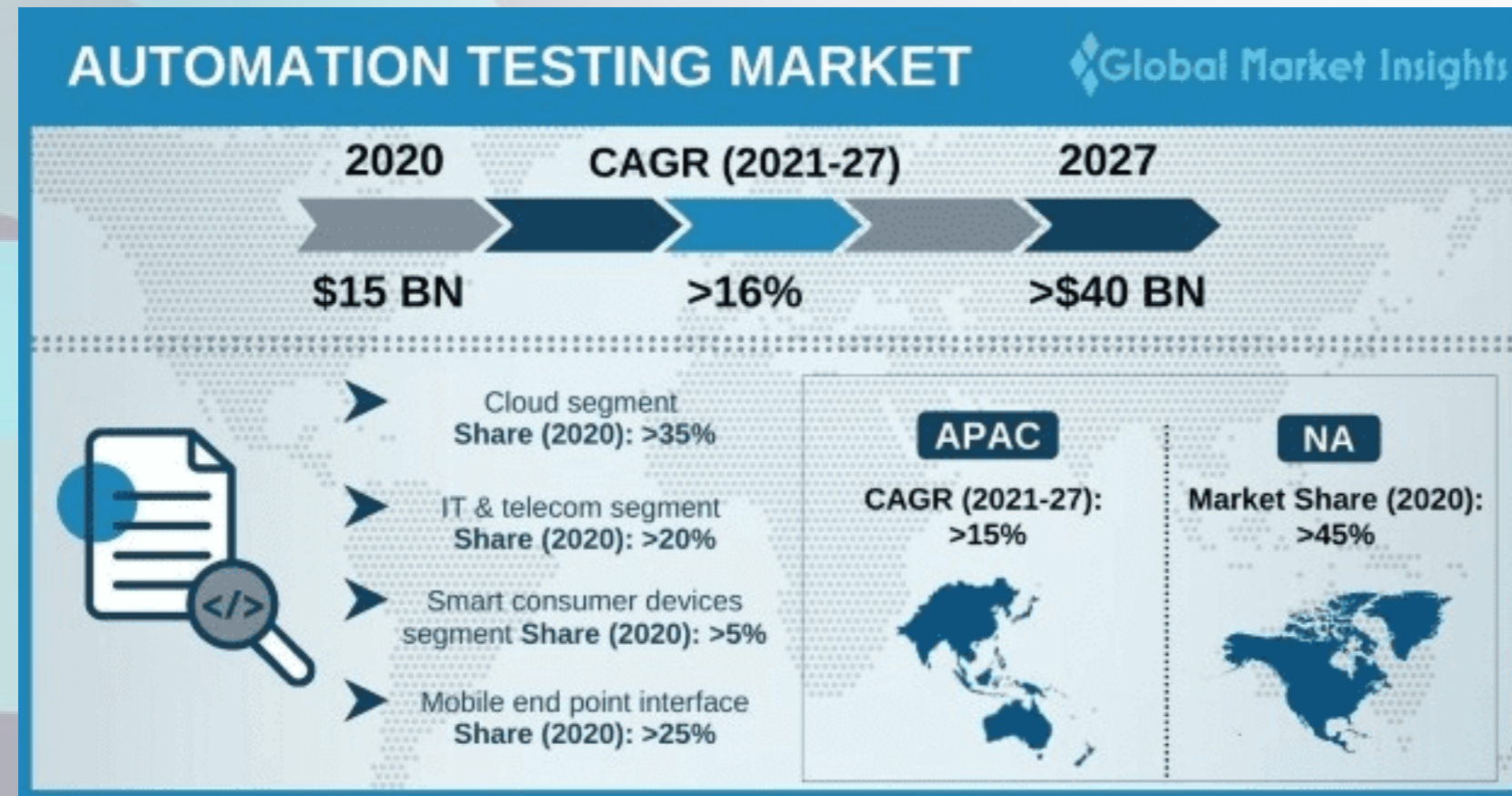
Automated QA (quality assurance) testing is a part of the software development lifecycle and involves using automated testing tools to conduct tests on the software being developed.

Automated testing is beneficial for Agile processes that involve continuous integration (CI) and continuous delivery (CD). CI/CD focuses on development lifecycles where software development, testing, and deployment occur multiple times throughout the day. In contrast to traditional software development that separately deals with coding and testing, automated QA tests are run more frequently, facilitating development and problem solving simultaneously.



Role of Agile and DevOps

While the **global automation testing market** exceeded \$15 billion in 2020, it has a projected growth rate of 16% during 2021-2027.



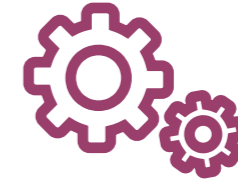
The cause of the booming market can be primarily attributed to the growing propensity of enterprises to embrace Agile and DevOps methodologies. Agile and DevOps practices lessen automation testing turnaround time and enable companies to market their software products faster.

Moreover, Agile and DevOps methodologies allow flexibility, post-deployment troubleshooting, and quick removal of errors. As a result of these benefits, the demand for Agile and DevOps-based automation testing is likely to increase across different sectors.

The emphasis on developing Agile and DevOps-based test automation platforms is paramount to staying competitive. Additionally, the COVID-19 pandemic has fast-tracked the use of automation testing services in several sectors. In particular, healthcare, telecom, banking, financial services, and insurance sectors have benefitted immensely through faster software development lifecycles and improved customer experience.

Stages of Automated QA Testing

Automated QA testing runs alongside the software development lifecycle and includes the stages below:



4. Setting up the environment

Creating the proper testing environment is crucial to maximising test coverage. For this, the QA team must develop testbed scripts, schedule and track hardware and software installation, along with other environment setup activities.



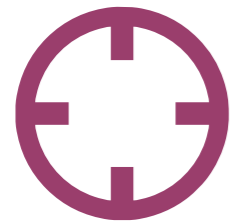
3. Designing a strategy

Next, the QA team must design a suitable testing framework that aligns with the project's approach and end goals and contains common practices, standards, and testing tools.



2. Choosing an automation tool

After defining the scope of the test, choose an automation tool that fits the project requirements. Factoring in the tool's cost, along with flexibility, functionality, and intuitiveness is equally critical.



1. Defining the scope

The first step involves a feasibility analysis and figuring out the aims of the testing process while considering factors such as budget, expertise, and resources.



5. Writing scripts

In this step, the QA team writes automated test scripts to run the tests. The scripts must be structured, reusable, easy-to-understand, and based on scripting standards and project requirements.



6. Executing the tests

API testing and GUI testing are the two main ways to automate QA tests. Different software tests include unit tests, functional tests, integration tests, end-to-end tests, smoke tests, regression tests, and performance tests.



7. Analysis and reporting

After the test execution, the automation tool will generate a report showing errors or if additional testing is required.

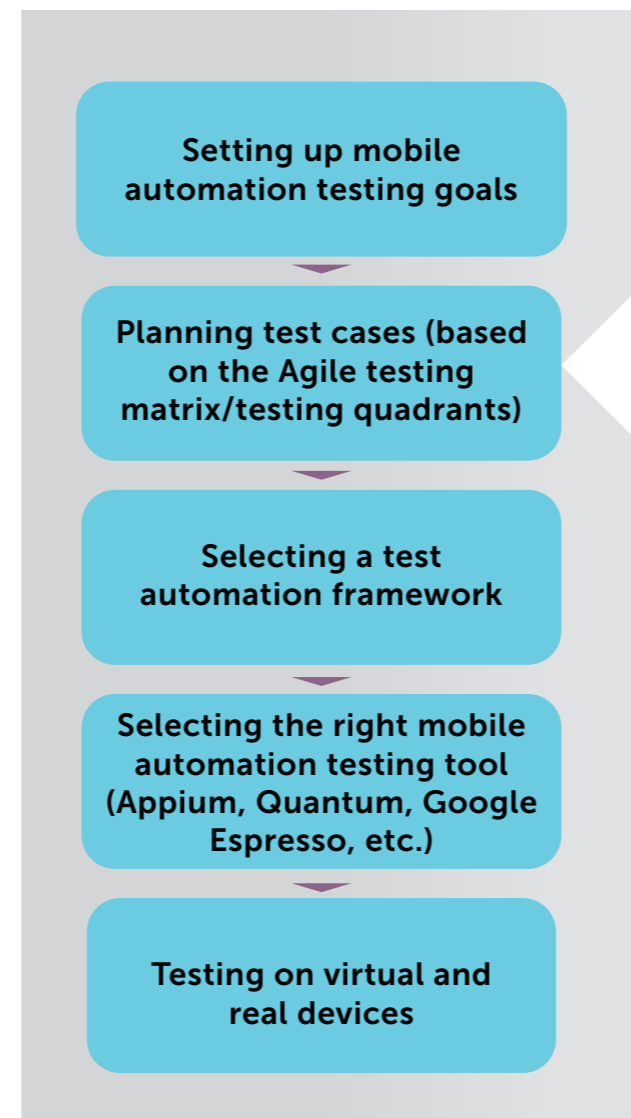
Mobile App Testing Automation

The demand for high-performance and sophisticated B2B and B2C mobile apps has fuelled the expansion of the global mobile app market with an annual projected growth rate of **11.5%**. With the **escalating number of mobile device users**, increased internet access, and the growing use of technologies such as ML and AI in mobile apps, the demand for mobile apps will only increase in the coming years.

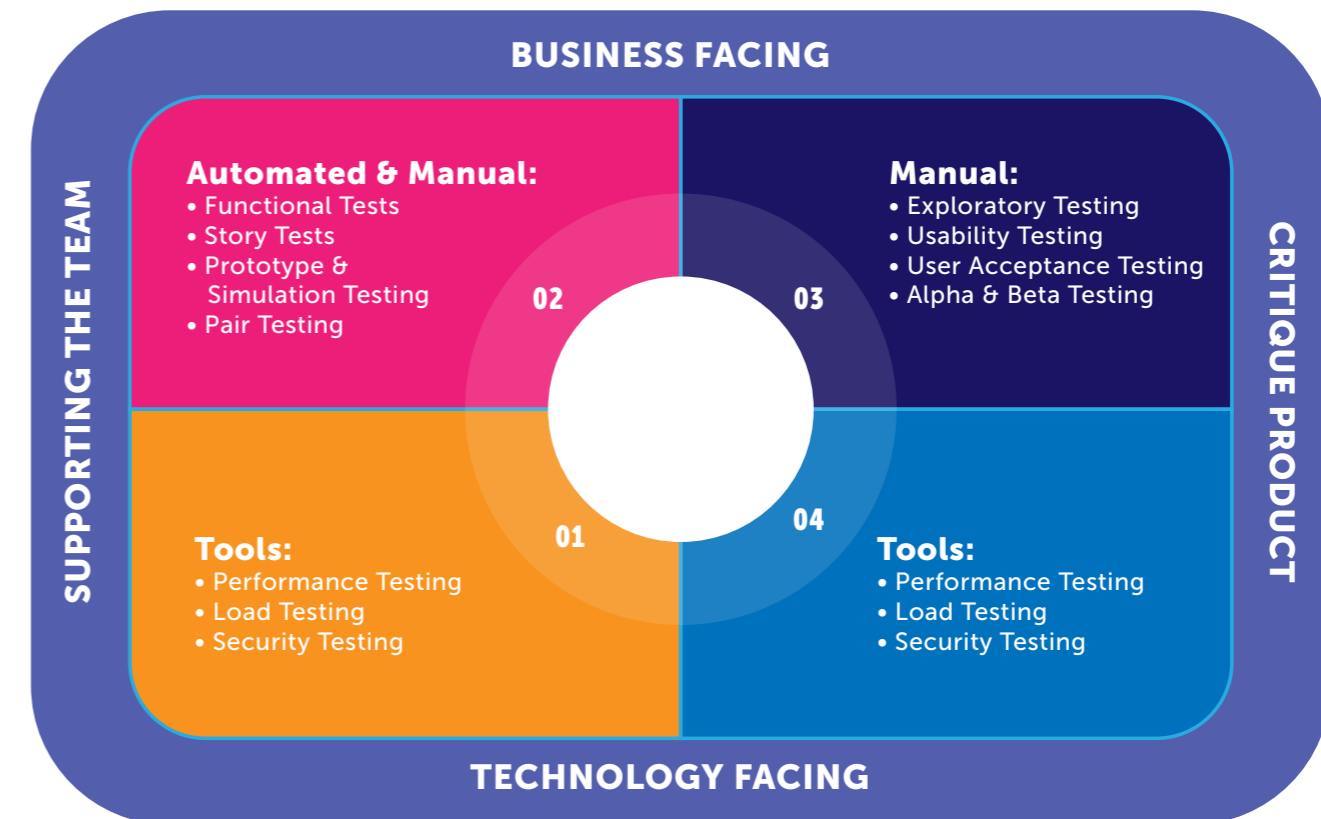
While the use of mobile devices has increased, there has been a simultaneous drop in tolerance for bugs and malfunctioning apps. Consumer expectations are high, and apps that deliver poor performance are **abandoned** without a second thought.

Therefore, the need for continuous mobile app testing is pertinent to ensure performance and quality.

The flowchart below outlines the different steps and parameters involved in the mobile app testing automation process:



AGILE TESTING: QUADRANTS



Benefits of Automation

Automation testing has several benefits for the industry, SaaS business owners, and end-users. Here are some of the advantages of using automation technology in software development:



Improved accuracy:

Manual testing is error-prone, even if done by the most diligent tester. Automation testing improves accuracy and frees testers from repetitive manual tests.



Time and cost-saving:

With automated testing, whenever there is a change in the source code, tests can run automatically. Thus, developers can identify problems on the fly, which, in turn, saves time and resources.



Enhanced bug detection:

Automation testing simplifies and improves the detection of bugs and other defects. Moreover, automation testing can perform controlled web application tests with thousands of virtual users.



Fast development and delivery:

Automation significantly increases testing speed, shortens software development cycles, facilitates frequent releases, enables quicker updates to the app, and ensures faster time-to-market delivery.



DevOps implementation:

Automated testing is the key to implementing DevOps practices and switching to the continuous integration and continuous delivery (CI/CD) pipeline.

Role of Automation QA in Software Development Process

Automation Quality Assurance (QA) brings several benefits to the software development process, from minimised errors and improved bug detection to reduced expenses and faster feedback. Developers can apply automation to every stage of the software development cycle, especially those not requiring human creativity and strategy. The most significant advantage of automating manual and repetitive tasks is that it frees up human resources for more critical tasks.

Below is a list of some processes where organisations can use automation during the development cycle:

- ⚙️ Requirement automation
- ⚙️ Design automation
- ⚙️ Development automation
- ⚙️ Deployment automation
- ⚙️ Operations automation

The Road Ahead: Growth Drivers and Challenges of Automation Testing

The advancement of machine learning, AI, and IoT poses an excellent opportunity for the automation testing industry to explore the potential of these modern technologies. Moreover, the **rising market trend of mobile-based apps**, which require continuous updated versions and upgrades, has stimulated the automation testing market. The increasing availability of mobile and web-based apps, lower data prices, affordability of smartphones, and more end-user spending power also contribute to the market growth. Plus, the centralised nature of cloud platforms provides a reliable foundation for developing highly-advanced cloud-based automation testing tools.

However, it is pertinent to point out that data security concerns remain a critical challenge of deploying automation testing solutions. Stringent government rules and regulations around data security and compliance add further restraints. Thus, addressing security concerns is as relevant as adopting automation testing solutions and services.



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