



TEST AUTOMATION REPORT CARD 2021

INDEX

INTRODUCTION	03
ABSTRACT	04
REVIEW OF TEST AUTOMATION IN 2021	05-08
TRENDS IN TEST AUTOMATION IN 2021	09-10
CONCLUSION	11

INTRODUCTION

The Pandemic brought in its wake sweeping changes in the way business and life itself operated. What began in 2020, gained momentum in 2021, with the second wave taking the world by storm – albeit negatively. The old order changed, and life in 2021 arrived at a “new normal” which brought in its wake a flurry of digitization in every area!

The pandemic bogey also spurred the need for contactless conduct. Hordes of end users continued to migrate to smartphones for everything from communication to education, shopping, banking, entertainment, spirituality and a host of other areas. Even small businesses felt the burning need to go digital or face the risk of fading out. With this came the need for enhanced speed and accuracy in Mobile App Development and Testing.

The software testing market saw an unusual pandemic-driven spurt in 2020, yet it continued to hold promise in 2021, and is expected to have a good run over the next few years.

According to a report by Markets and Markets, the global Automation Testing market size is expected to grow from USD 20.7 billion in 2021 to USD 49.9 billion by 2026 – a Compound Annual Growth Rate (CAGR) of 19.2% during the forecast period. The report attributed the growing market for Automation Testing, to the rapid adoption of advanced technologies, resulting from a rising demand for scalable and adaptable delivery models. These projections speak volumes of the growing importance of Test Automation.

Set in this background, this whitepaper reviews how the global business and social environments have driven the course of Automation in Software Development and Testing in 2021. It presents how Test Automation has fared, reviewing its performance on various fronts and it also touches on the developing Trends in Automated Testing.



ABSTRACT

The Software Development and Testing fields are rapidly renewing because of the fast paced innovations that drive them. Various factors have extremely crunched the SDLC, yet accuracy is a non-negotiable. This has rapidly set the Test Automation ball rolling.

In this report we examine how Test Automation has fared and have adopted a two pronged approach. The first part is a Review of Test Automation in 2021 and the second part examines the Trends in Test Automation observed in 2021. In order to get a realistic view from those with an ear to the ground, this report combines the findings of surveys of software professionals and also incorporates the views of renowned analysts.

The first part which is a Review of Test Automation in 2021 presents some of the key parameters of test automation as seen in 2021 and also includes a comparison with the same parameters in 2020. This holistic review covers the following parameters of test automation:

1. Systems and Technologies Tested
2. Development and Testing Models or Principles
3. Usage of Continuous Integration and Continuous Deployment (CI/CD)
4. Involvement of the Testing Team in CI/CD Process
5. Test Management Tools
6. Share of Automation in Various Kinds of Tests

The second part unfolds the Trends in Test Automation in 2021 and includes observations of reputed analysts. A summary of these trends is listed below:

1. Increasing Shift to Test Automation
2. Shift from Waterfall to Agile Models
3. Increasing Use of Artificial Intelligence (AI)
4. Trend Towards Cloud Based Development and Testing
5. Trend towards Robotic Process Automation (RPA).

Together, these two sections will provide a comprehensive view of Test Automation in 2021.



REVIEW OF TEST AUTOMATION IN 2021



The first part of this Report Card, presents a Review of Test Automation in 2021, analyzing the key areas of Test Automation and comparing them with the parameters seen in 2020. In order to get a realistic view as mentioned earlier, this review has been based on the findings of a global survey conducted by PractiTest, where the respondents were software professionals.

The survey lists the responses of 1500 software professionals, where 67% of the respondents had more than 5 years of experience in the software testing field. What's interesting to note is that 71% of the respondents said that their incomes were not affected by the pandemic, which is not surprising considering that the pandemic brought a paradigm shift to digitization in the way business was conducted.

The survey findings have been scanned to pick out the points that throw most light on how the various aspects of Test Automation have fared in 2021, and our observations have also been added and presented below:

01

SYSTEMS AND TECHNOLOGIES TESTED

In 2021, Web Systems continued to occupy the no. 1 place at 74% for all systems and technologies tested, followed by Mobiles at 60%. The no. 3 spot was occupied by Sandboxing, Kubernetes, Dockers etc. at 45%, and close on its heels were Micro-services at 44% and Desktops at 43%. At 34% were Internally Developed Systems followed by a host of others ranging from 26% all the way down to 4%.

As compared to 2020, testing of Web Systems recorded a drop of 1.04%, whereas Mobile Systems increased by 1% and Sandboxing, Kubernetes, Dockers etc. saw a rise of 1.88%.

The highest increase in testing was observed in Micro-services where the growth in 2021 was 7.99%. The largest drop in testing was in Internally Developed Systems.

However, the year-on-year increase or decrease must be seen in perspective - considering that the comparison is with the year 2020, which experienced an unusual spurt in digitization due to the pandemic.

02

DEVELOPMENT AND TESTING MODELS OR PRINCIPLES

Before browsing the numbers, it may be noted that the models used by respondents included a combination of two or more models.

In 2021, Agile or Agile-like models occupied no. 1 place at 92%, followed by Devops at 42% in the no. 2 place. The no. 3 slot was shared by Waterfall-like models and Behavior Driven Development (BDD) at 27%. Next was Test Driven Development (TDD) at 21%, followed by other models ranging from 8% downward to 4%.

As compared to 2020, Agile or Agile-like models recorded an increase of 3%, Devops increased 1% and BDD increased 4%. However, Waterfall-like models saw a drop of 5% and TDD dropped by 1%.

The most popular methodologies or models in 2021 were Agile and Devops which continued their increasing trend. This along-with the drop in Waterfall-like models indicates a growing trend towards models that support test automation. BDD too has gained good ground in 2021.

03

USAGE OF CONTINUOUS INTEGRATION AND CONTINUOUS DEPLOYMENT (CI/CD)

Before getting into the statistics, here's a quick recap of what CI/CD is about and why it is important for Test Automation.

Continuous integration (CI) is the process of collecting codes of various developers working on a project, and placing them in a common code repository, to check for bugs and/or incompatibility with previously approved codes. It helps mitigate the challenges of code integration by automating test execution each time a code is integrated. Continuous Deployment (CD) is the process by which the updated builds which have been tested and kept fully ready are then deployed to production.

In 2021, 44% of the respondents said that their company used CI/CD in all projects, whereas 35% said that they used it in some projects. 16% did not use CI/CD and 2% were not even aware of CI/CD.

Compared to 2020, there was a 2.5% increase in companies using CI/CD in all projects and this was in line with the continuing year-on-year increasing trend. However, the total usage of CI/CD in the companies linked to the survey, remained the same at around 80%.

04

INVOLVEMENT OF THE TESTING TEAM
IN CI/CD PROCESS

In 2021, 41% of the testers said that they were actively involved in the CI/CD process; 16% said they used CI/CD reports as feedback for their testing; and 43% were not part of the CI/CD process.

As compared to 2020, active involvement of testers in the CI/CD process reduced by 5%; those using CI/CD reports as feedback for testing increased marginally by 0.5%; and those who were not part of CI/CD increased by 4.5%. This is not a healthy trend considering the importance of CI/CD for boosting speed and accuracy in the testing process.

05

TEST MANAGEMENT TOOLS

Every team will have their own preferences for different Test Management Tools or even a combination of two or more tools. This section will review the respondents' usage of these various tools for test management in 2021 and the comparative shift in usage of each type of tool compared to 2020.

In 2021, the percentile usage of tools was as follows:

Bug Tracking Tools like Bugzilla, Jira, Redmine etc. were used by 75% respondents; Agile Workflow tools like Trello, Jira, Agile etc. had a share of 59%; MS- Excel, MS-Word, Mail and other such tools had a usage share of 54%; Source Control Tools like GitHub, BigBucket etc. were at 46%; ; Test or QA Management Tools like QC/ALM, TFS, PractiTest etc. were at 38%; Mind Maps were at 22%; Project Management Tools at 18% and Exploratory Note-taking Tools were at 14%.

Compared to 2020, there was a 1% drop in usage of Bug Tracking Tools; an increase of 5% in Agile Workflow tools; a 2% increase in MS- Excel, MS-Word, Mail and other such tools; a 3% increase in Source Control Tools; a 2% decrease in Test or QA Management Tools; 5% increase in Mind Maps as a test management tool; 1% increase in Project Management Tools; and a 2% decrease in Exploratory Note-taking Tools.

In 2021, there's been a rather significant increase of 5% each in tools like Agile Workflows and Mind Maps. However, it may be noted that non-testing tools like MS Office and Mail were still used for test management, by 54% of the respondents in 2021.

06

SHARE OF AUTOMATION IN VARIOUS KINDS OF TESTS

Given below is the extent to which automation has been incorporated for various types of tests in 2021 and the increase or decrease as compared to 2020 according to the survey:

Type of Test	% of Automation in 2021	% Increase or Decrease in Automation - 2021 v/s 2020
Functional or Regression Testing	75%	0%
CI/CD	49%	-1%
Unit Testing	43%	-9%
Load and Stress Testing	43%	+2%
Production Testing and Synthetic Monitoring & Alerts	6%	-12%
Test Data Generation	30%	+1%
BDD Scripts Using Specflow, Gherkin	20%	+3%
Home-built Scripts	17%	-2%
Log and Data Analysis	14%	+3%

The share of automation in Regression Testing remained the same at 75% over the two years.

2021 recorded an increase of automation in BDD by 3%; Log and Data Analysis by 3 %; Load and Stress Testing by 2% and Test Data Generation by 1%.

However there was an alarming fall in automation in 2021 for Unit Testing by 9% and for Production Testing by 12%! CI/CD and Home-built Scripts also recorded a fall in automation in 2021 by 1% and 2% respectively.

Having reviewed some of the key parameters of Test Automation, the report card will now move on to review how Test Automation has been shaping up in 2021.

TRENDS IN TEST AUTOMATION IN 2021

In this part of the Test Automation Report Card, we will review the increasing trends seen in Test Automation in 2021 and also touch upon the future projections made by reputed analysts based on these recent trends.

Increasing Shift to Test Automation



The need for speed and accuracy in testing coupled with the crunched testing time availability and increased competition, have all been responsible for an increased movement towards test automation. According to a report by Markets and Markets: The global Test Automation market is expected to grow at a Compound Annual Growth Rate (CAGR) of 19.2% during the period 2021 to 2026. The highest CAGR is expected to be in the APAC region in the major economies, such as Australia, Japan, Singapore, New Zealand, and Hong Kong and especially India and China which have very large customer bases. The report mentions that the governments are taking initiatives for rapid adoption of new technologies like AI and ML, automation, IoT, mobile and web-based applications, cloud-based services, and other technologies.

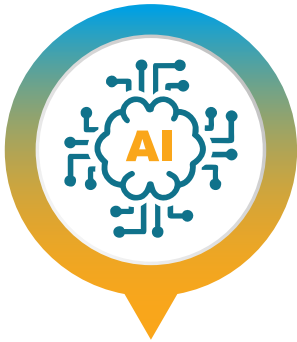
The increased trend towards automation, has spurred an increasing shift from Waterfall to Agile Models in software development and testing. The Waterfall model followed a sequential order, where the software team would move to the next phase of development or testing only if the previous step was successfully completed. The Agile model facilitates continuous iteration of development and testing in the software development process, and is therefore a much more suitable model for automation.

According to a Market Research Report by Facts and Factors, the global Agile Development and Testing Services market & revenue share, was expected to grow from USD 20 Billion in 2020 to reach USD 30 Billion by 2026, viz. an 18% annual CAGR growth during forecast period of 2021-2026.

Shift from Waterfall to Agile Models



Increasing Use of Artificial Intelligence (AI)



The pandemic brought in its wake an increasing desire for contactless services, thus spurring the demand for AI in various business operations.

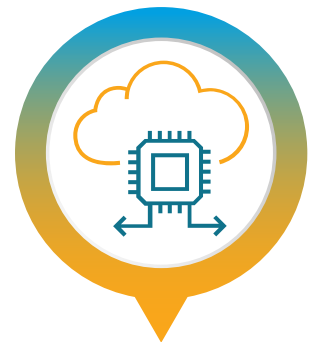
According to a report by AIM & TAPMI, the Indian Artificial Intelligence market across industries was valued at \$7.8 Bn as of July – August 2021 – a 22% increase in size of market over 2020. The market size by Industries or Sectors was the highest for the IT Services sector, followed by the Technology sector (including Software and Hardware firms), with a market share of 35% and 23.3% respectively.

The 2020 pandemic saw a great shift to the virtual space across sectors and the Software Development and Testing sectors were no exception. With the 2nd wave in 2021, the trend continued, more so for the software sector, as it proved more cost-effective, scalable and secure.

According to Gartner, Cloud spending was projected to increase by 19% in 2021.

Cloud hosted testing platforms are likely to have a considerable following because it facilitates parallel testing of the numerous devices and browsers which can prove very expensive and tedious if done in the physical realm.

Trend Towards Cloud Base Development and Testing



Trend towards Robotic Process Automation (RPA)



According to a Gartner forecast, the global Robotic Process Automation (RPA) software revenue was projected to reach \$1.89 billion in 2021, and is expected to continue to grow by double digits through to 2024. Forrester's also held the view that RPA was gaining ground in 2021.

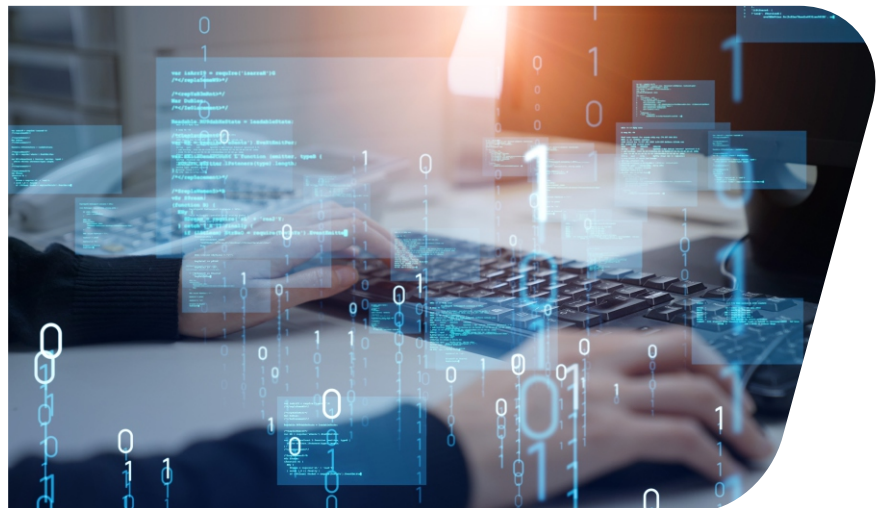
RPA along with hyper-automation has shown promising trends for 2021 and the growth is expected to continue in the years to come.

CONCLUSION

To sum up: On the whole 2021, has seen a rise in Test Automation, necessitated by various factors – primary among these being, the need for speed and accuracy in a rapidly changing digital world. There are literally millions of apps competing for attention, so there’s absolutely no room for any error. There’s also a tearing hurry to get to the market before competitors - not only with the original app, but also with the frequent updates offered by constant innovation. The solution clearly points in the direction of automation.

Automation itself is constantly getting refined, and the trends are towards increasing dependence on Artificial Intelligence (AI) and a shift to technologies that facilitate automation. Testing in the virtual space is also becoming more attractive from the cost and convenience considerations. Robotic Process Automation is another promising area that is making furrows in the testing world.

The undeniable truth is that in the testing space change is a journey – not a destination. This is the reason why, at BOTm , we constantly keep in touch with innovations to give you the benefits of the latest in technology – AI, ML, Cloud Based Testing. To set your mobile app testing in the right direction it’s important to be on the right side of the digital divide.



Experience for yourself the power of Mobile App Test Automation with BOTm – the Accelerator BOT. Visit us at www.botmtesting.com and begin your journey in Test Automation, with a Free Trail today.

GET IN TOUCH

 **022 4050 8200**

 sales@botmtesting.com |  www.botmtesting.com

BOTm is the accelerator BOT for automated and manual testing of mobile applications - developed for both Android and iOS devices.