FUTURE OF MOBILE AND WEB TEST AUTOMATION

Future of Mobile and Web Test Automation

The experts of the Future Market Insights research center predict an active pace of development of the market for automated mobile app testing. They expect average annual growth of 14.3% over the next decade. Thus, by 2032, the sphere of automated testing will reach $93.6 billion, while now it is only $24.7 billion. What is the reason for this industry's unprecedented rate of development, and how will it change in the future?

ZappleTech experts have studied the forecasts of leading experts and the prospects for developing automated testing technologies and are ready to share interesting information with you.

Prospects for the Development of Automated Mobile Testing

At the Applitools conference on the future of mobile testing, Jason Huggins-the founder of Selenium, Appium, and Tapster Robotics-said that testing is getting weird, because it's slowly moving to an activity you can't see.

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«It's time to move past an understanding of testing as just simulating what can be seen and tapped. What mobile testers are ultimately interested in today is the triggering of radioactivity. That's the essence of how your app truly performs, isn't it?»

Jason Huggins

Robots and robotic systems are carrying out more and more processes. This applies to mobile development and testing but also to other areas of human activity. Therefore, more and more processes are becoming intangible physically, and testers need to be prepared for this. In the long term, mobile testing can achieve almost complete automation, but it will take years. If we talk about the near future, however, QA professionals will continue to use the trends of 2022 with possible improvements.

Using innovative technologies such as artificial intelligence (AI) or machine learning (ML) improves testing environments, saves time on routine tasks, and more. Thus, testing with automated solutions relieves the testing team from time-consuming app validation processes. This is one of the reasons analysts predict a dramatic increase in demand for automation.

Specialists incorporate innovative technologies into testing processes, develop new tools, and transform existing solutions. Let's look at some of the most popular trends in the automated mobile testing market.

Using AI in testing

As predictions show, artificial intelligence will be more actively used in testing soon. This will primarily affect the field of analytics and reporting, where AI is already solving essential tasks.

AI will continue to be used for:

- Optimizing test selection, identifying the best tests, and weeding out ineffective ones.

- Improving Log Analytics by identifying unique test cases, including automatic and manual checks.

- Reporting on defects and detected failures that could harm the entire product.

- Collecting predictive analytics that focuses on user needs, thereby helping to optimize the testing process.
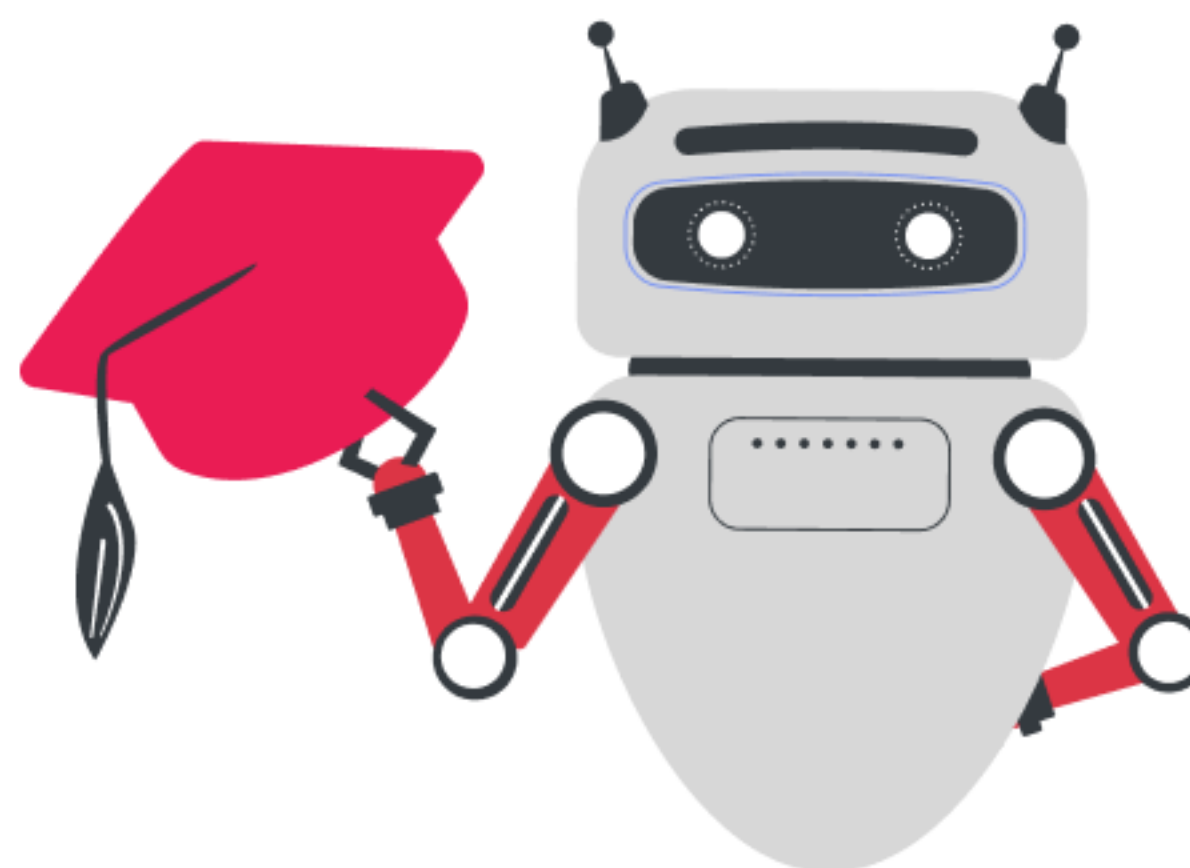
Adam Karmi, co-founder, and CTO of Applitools, believes there will be greater use of visual AI for testing. His company's Applitools Eyes project, based on visual AI, automatically detects "visual" and functional regressions in source images of apps. This achieves maximum accuracy in comparing layout and screen structure and quickly detects defects or errors, which greatly facilitates further development.

Based on our own experience, we can say that many testers actively use AI-based tools, but their number will only increase in the future.

Development of test case writing

Now, among the variety of frameworks based on keywords and NLP, we see more innovative frameworks in testing. This is due to the fact that NLP platforms allow you to write test cases based on keywords, guided by simple and clear language. This makes the work of testers much easier, so increased interest in using NLP in conjunction with automation is expected in the future.

One of the leading test automation tools today is Testing Whiz. It provides code-free testing and facilitates rapid creation and deployment of test scripts based on the NLP environment and keywords. This combination of human intelligence and machine learning accelerates extracting key information from unstructured data streams.

Current options for writing test cases:

- **Traditional approach:** manual writing of test cases; it still persists and will be used in the coming years, as in some specific situations, is the best option.

- **Comprehensive approach:** using several frameworks: data-driven, linear scripting, or modular testing, to write scripts. They allow you to create sets of test cases for various checks and test automation, which makes them popular.

- **The approach to writing test cases without code** is based on keywords and action words to perform functions, from which test cases are compiled.

- **Natural speech approach to writing test cases** done through NLP Driven Frameworks. Also, the Behavior Driven Framework is used to compose test cases in plain English.

Our experts' experience shows that "simple" does not mean "bad" at all. Another proof of this is the active use of frameworks based on simple descriptive speech and the introduction of neurolinguistic programming.

Manual testing will be present for a long time because writing test cases and running autotests is still impossible without human involvement. Nevertheless, with new algorithms, QA professionals will have more free time to work on other projects.

Trends in the validation process

The main change that awaits the validation process is Smart Validation. It involves the use of artificial intelligence and algorithms. With the help of these technologies, the validation testing process can be improved to meet the original product requirements.

Smart Validation is likely to have a great future, as the combination of AI and its own algorithms can collect the most important and accurate data for companies.

The tasks Smart Validation performs now:

- Detects errors and incorrect company and employee data

- Helps solve formatting problems

- Performs domain-based validations

- Provides users with data about the domains available for purchase

The harmonious coupling of AI and ML will take the lead in the industry of creating and running automated tests. This is because, with their help, it is possible to release mobile development times faster and without losing the quality of the final product.

Codeless Test Automation Tools:
Future Development Forecasts

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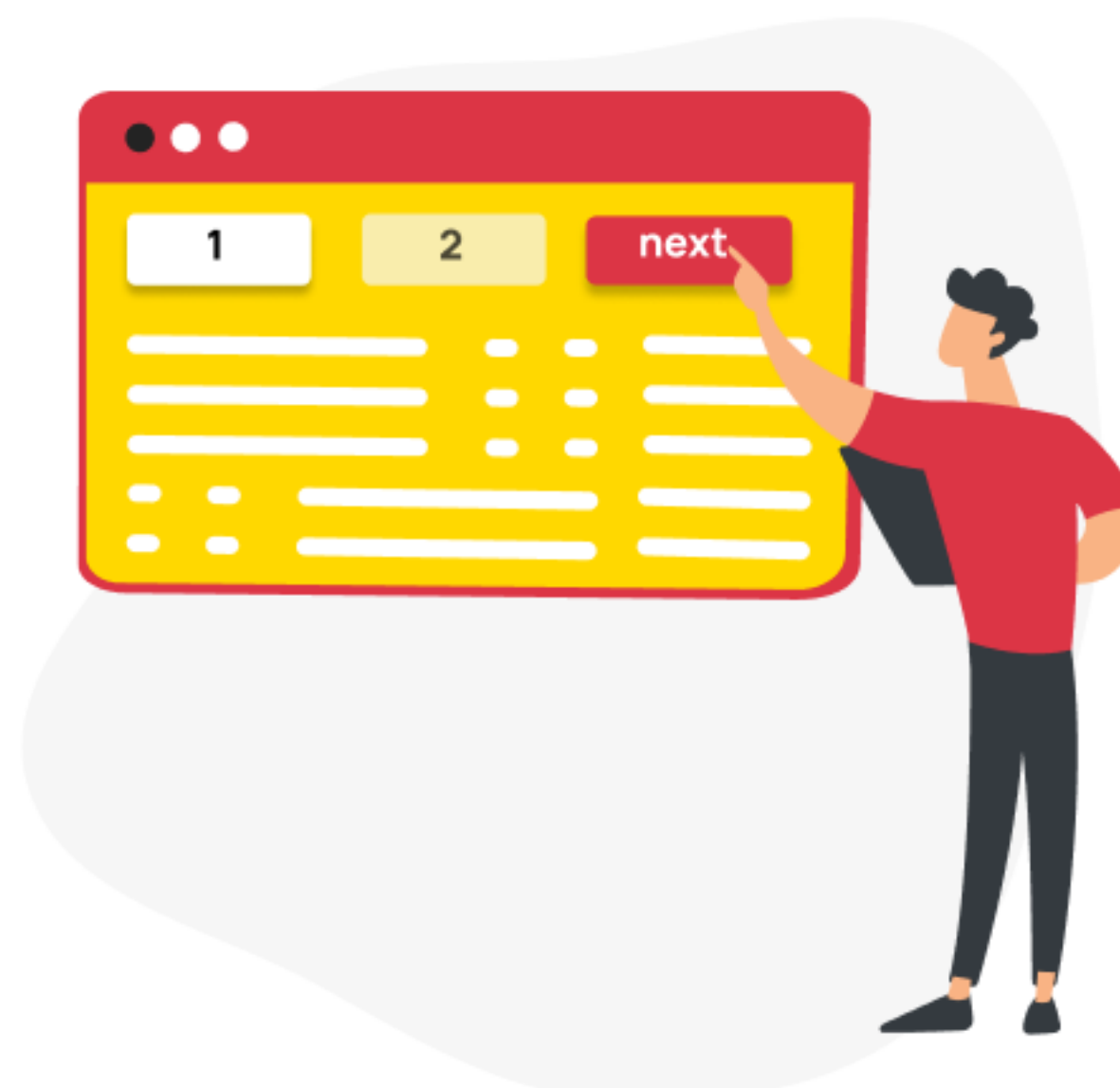
Katalon Studio

A test automation tool that has been well established in the web and mobile app development industry since 2020. It has an uncomplicated interface and many useful features, making it an indispensable service for automated testing without code.

Katalon features:

- Built-in object repositories, project templates, libraries, test case sets, and more

- Ability to automatically compose tests based on UI changes

- Automation of different types of testing: web, APIs, desktops, and laptops

- Deployment on Windows, macOS, and Linux

- Ability to use plugins for popular CI tools

- Generating detailed reports

- Generating tests based on product changes

- Ability to manage testing, issues, and communication

Today Katalon Studio is an actively developing project, which in 2022 became the best tool for test automation according to Gartner Peer Insights. Its functionality is constantly expanding, so it is possible that soon, it could become the benchmark for automation.
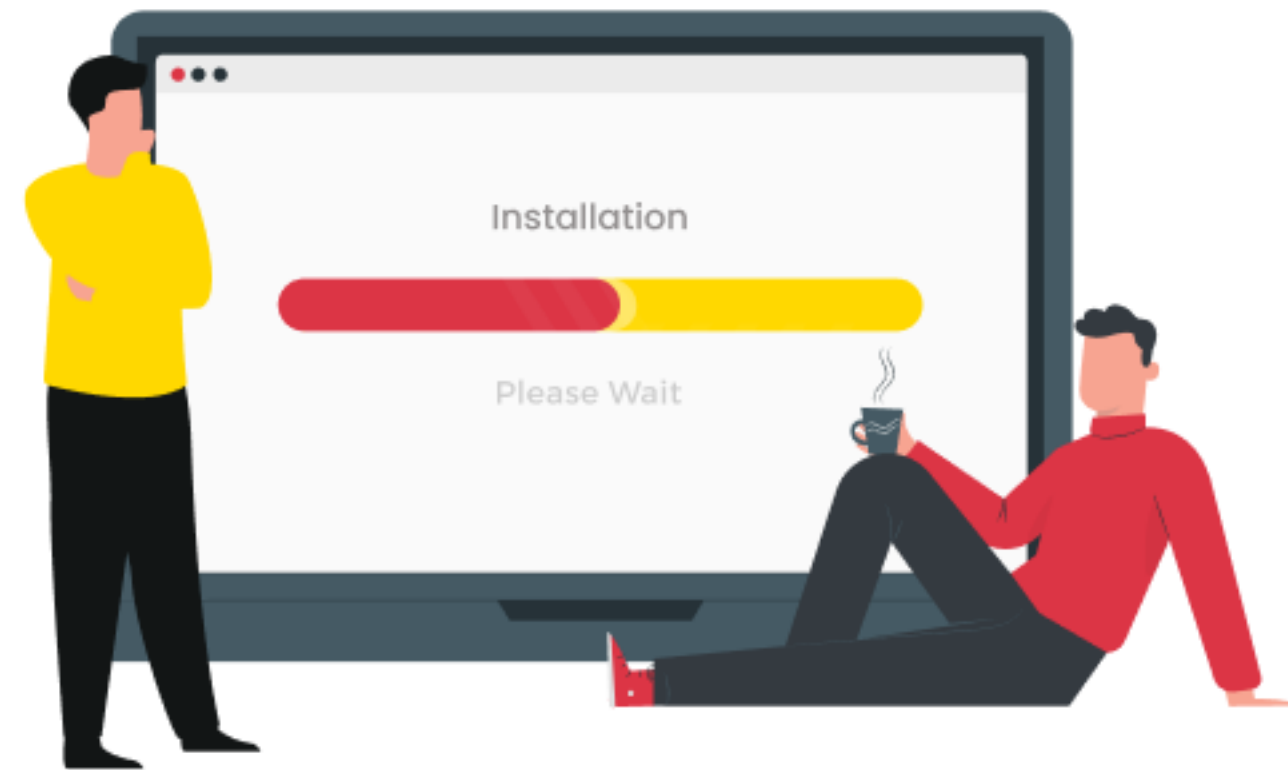
Appium

A popular open-source mobile testing automation environment. Its creators recently announced the release of a new version: Appium 2.0. Many people are waiting for the updated version among auto testing because the current version has disadvantages. So, when installing Appium, it was necessary to install a lot of drivers, some of whom are not involved in the work.

According to developers Sai Krishna and Srinivasan Sekar, Appium 2.0 will only install the drivers that are actually needed. They are also adding permanent fixes and improvements to the beta version.

To be fair, we note that Appium has become more stable in recent years. Also, the new version is expected to add more plugins and the ability to create your own plugins and drivers, which will help solve difficult problems.

21 Labs

This mobile test automation tool is quite easy to use. Its main advantage is that it is a self-learning AI-based automation tool. Thus, it is possible to create test scenarios very quickly and without compromising development quality. 21 Labs already covers the basic needs of testers, so many predict a great future for it in the field of automated testing.

What can 21 Labs do right now?

- Create AI-led test scenarios
- Test coverage measurement
- Self-service testing mechanism
- Locator system allows you to work with any structure
- Ability to write your own codes for JavaScript
- Exploring an AI-based mobile application
- Integration with mobile devices and emulators

21 Labs is a proprietary AI-based tool with unique features that make it easy to solve the problem of automating mobile app testing. As AI and other technologies evolve, the tool's creators add new features and release new products to make the work of testers and developers more convenient.

Ranorex Studio

Another feature-rich tool created for regression tests, UI functional tests, and others. Ranorex Studio's intuitive interface makes it one of the best options for automating application testing.

Features that Ranorex Studio has now:

- Cross-browser testing across devices and the web
- Cross-browser checks and tests
- Local and remote testing
- Working with SAP products, including their ERP system
- Support for testing in any programming language
- Automating testing of iOS and Android applications
- Creating informative and understandable reports on test results

Based on the capabilities that Ranorex now provides, we conclude that it has every chance of becoming the standard environment for automated testing. Of course, right now, Ranorex has some weaknesses. For example, there are problems in integrating tests with TMS test cases. But with further improvement of the tool, developers are expected to eliminate all of the issues and bring the environment to a new level of use.

Prospects for Using Other Frameworks in Automated Testing

Playwright

Open-source project Playwright is well established in the web testing and automation industry. The platform has several areas of activity:

- Build and distribute WebKit with headless-mode capability.
- Browser automation protocols: in Chromium - Chrome DevTools Protocol, in Safari - Web Inspector Protocol, in Firefox - Juggler Protocol.
- Playwright library with one API for communicating with all three browsers.
- A proprietary test-runner that was added in 2022.

Playwright's functionality is still being updated and expanded. According to the creator, the project is actively being finalized and improved.

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"His [Playwright's] ambitious goal is to 'fix' web testing, to make it acceptable, cheap, and accessible to web developers for the next 10-20 years."

Andrey Lushnikov
Creator of Playwright, co-author of Chrome DevTools and Puppeteer.

Selenium

The Selenium project began to be developed back in 2004, and by today it has transformed into an entire set of tools for browser-based test automation. In the course of its development, bugs were promptly corrected, and new features were introduced, so now, it is considered a standard in the testing industry.

Distinguishing features of Selenium:

- Writing automated test scripts in JavaScript, C#, Java, Ruby, Python

- Work in most popular browsers (Chrome, Firefox, Safari, Edge)

- Running tests in Selenium Grid in parallel

- Support for plugins, manual and auto test recording via the Selenium IDE

Based on our experience, we can say that in the near future, Selenium will remain in the rating of the best tools for test automation. The developers regularly release updates to solve problems that arise, but for now, no global changes to the project are expected.

Cypress

Cypress is a great framework for testing novices, as it has extensive documentation with guides, API descriptions, and other useful information.

Another open-source framework designed for E2E tests. Unlike Selenium, this is a young project that actively introduces new ways and solutions for automation. It records video and takes screenshots while tests are running, allows you to watch the test in real-time, and automatically restarts the test if the code changes. The framework also runs inside the browser, constantly monitors calls to events, and does not skip actions on-page elements.

Cypress is a promising framework that helps newcomers easily get into automated testing. And as the industry attracts more and more people, Cypress is likely to become more in demand.
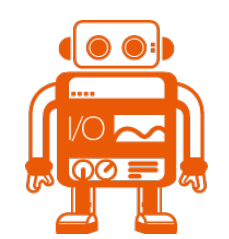
WebdriverIO

A next-generation framework for automated testing of web and mobile apps for Node.js. WebdriverIO is written in JavaScript and has a Node package. It has its own tool to run tests, supports most of the BDD and TDD test frameworks, and also "cooperates" with other testing environments (Cucumber, Mocha, Jasmine).

As an automation environment, WebdriverIO can be used:

- for web apps written in React, Vue, Angular, Svelte, and others

- for native and hybrid mobile apps running on real devices and simulators

- for desktop apps written in Electron.js

WebdriverIO was actively discussed at the Open Quality conference back in 2020 and has not lost its relevance in the testing community since then. Therefore, there is every reason to say that this framework will definitely not be forgotten in the next couple of years.

Changing Requirements for Testers

Mobile testing automation brings with it not only the introduction and use of innovative environments and more advanced frameworks. The automation process also raises the threshold for entering the profession of a QA engineer. Now, new requirements for the skills of specialists are being formed in the employment market.

Among the "automation skills," we will distinguish the main ones:

DevOps-oriented practices.

> "DevOps has become the standard methodology for software development as well as cloud deployments, so those who don't understand DevOps principles and practices will have a hard time."

Clyde Sipersad
Senior vice president and general manager of the Linux Foundation

Ability to write test scripts in the built-in language of the platform.

> "Also, another important skill is writing Python scripts for web scraping to quickly collect and organize useful data."

Chris Nicholson
Head of the AI group at Clipboard Health

Automated testing skills.

> "Automated testing skills, whether testing traditionally built software or testing RPA or low-code solutions, are very important. The ability to automatically test new versions of software is key to achieving continuous delivery and more rapid adoption of value in production,"

Mike Mason
Thoughtworks technology manager

Automating mobile testing is a very large-scale process that is already bringing about positive changes in development quality assurance. That is why we join leading experts in saying that the future of testing is almost completely automated test cases and close cooperation between testers and developers.

Thanks for reading!

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