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Test Automation

TEST AUTOMATION MARKET RESEARCH 2023

REPORT #ZAPPT001

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Test Automation Market Research 2023

New technologies and increased automation capabilities in software testing are transforming the landscape of software testing and impacting IT organizations. As testing automation is deployed and automated in a more complex and connected IT infrastructure, automation capabilities are also evolving to meet the needs of today's business. This is creating a new era of test automation and creating a shift in the testing automation landscape.

New technologies are constantly evolving and are used for developing software in many industries. Companies also stick to new software development trends in order to increase the efficiency of the development process and improve the quality of the final product.

This e-book contains an analysis of the major software testing Market Research in 2023:

■ Machine learning ■ Internet of things ■ Robotic process automation ■ Codeless automation ■ AR \ VR testing

Here, we explore how these technologies are working and how to use them to improve the automation process in software development.

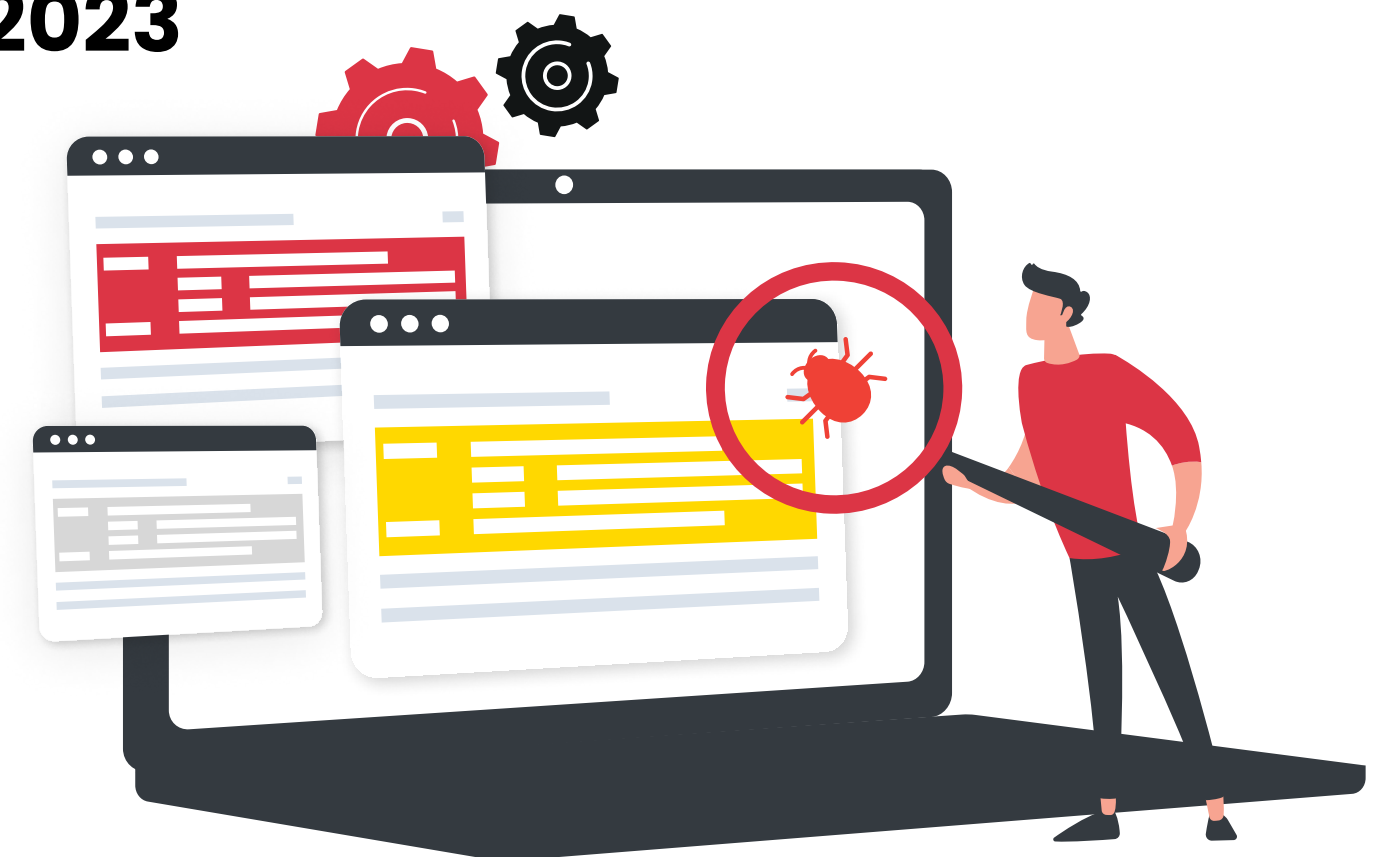
The second part of the e-book includes a description of test automation tools that can be used for implementing the development trends in the software development process.

Introduction

In this e-book, we will look at how the software industry is adapting to the change in technology by exploring the test automation trends in 2023. Implementing automation has been a key focus of the software industry and is still prevalent in the future. We will speak of how to make automation more accessible to the software industry, by making automation tools more user-friendly.

The dominant trends in test automation in 2023

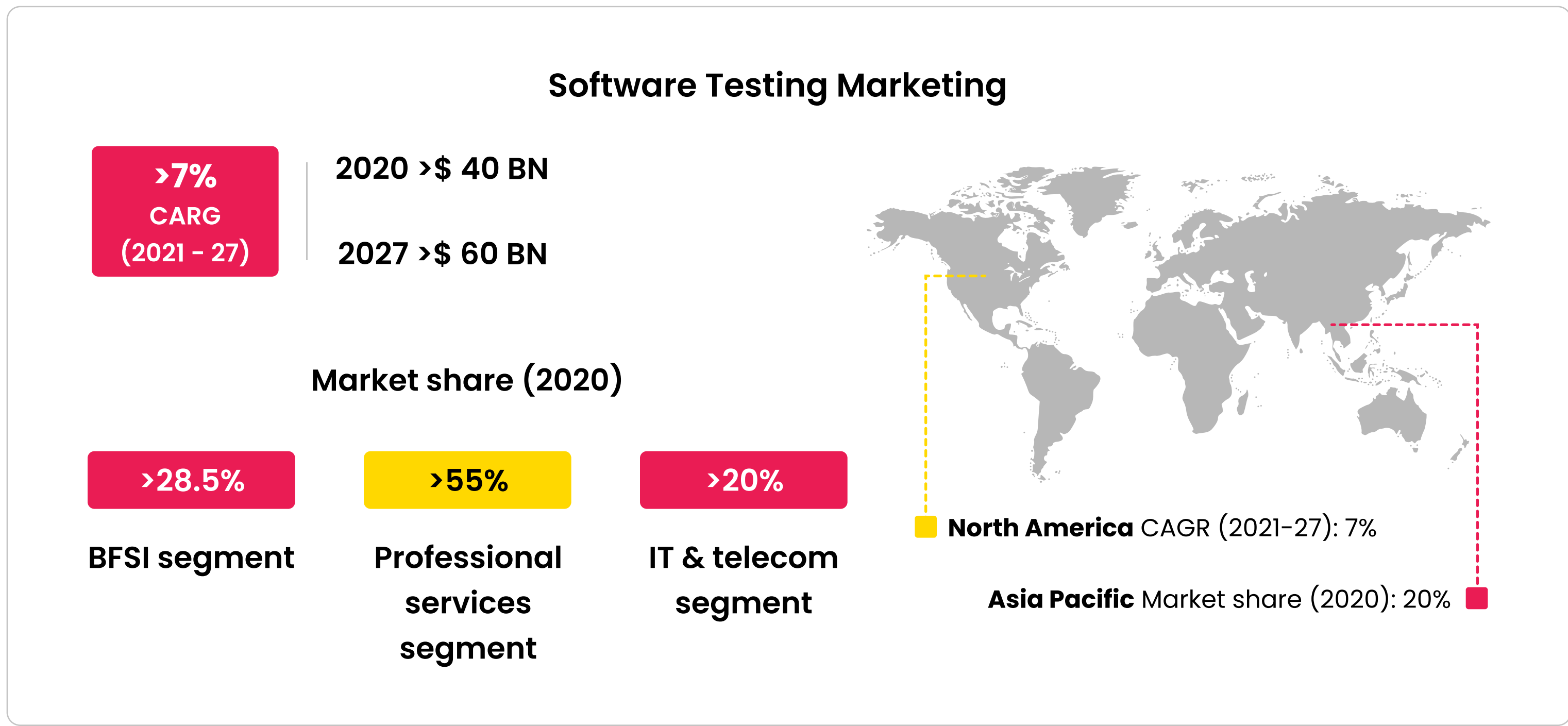
As software testing evolves, automated testing will enter the mainstream and become a standard practice in software development. Automated testing is expected to change the way of software delivery because it will offer developers a new way to faster software development without sacrificing quality. In this context, there are a few areas where software testing will change in the next years.



Machine learning

Artificial intelligence is using of some form of computer intelligence for solving a task. Machine learning is a basis for AI systems. It remembers the patterns, recognizes them and processes them with its algorithm for predicting future trends based on historical data.

ML is the major topic of discussion in the software testing industry in 2023. In 2020, ML's share of the software testing market has reached about \$40 billion, and it's expected to reach \$60 billion by 2027.



AI \ ML technologies can optimize test suites by finding unneeded test cases, and by making sure that optimal test coverage is done by inspecting keywords. For example, machine learning can automate test suites by creating scripts that do the same thing as manual testers. This can take a lot of the manual test cases out of the equation.

Here are some areas where AI / ML technologies can be used in automated software testing:

- Predictive analytics – estimating and specifying the behavior of end-users and spotting the areas of its concentration
- Defect analytics – finding out more areas of concentrating defects and taking less time for fixing them
- Log analytics – concentrating on exceptional test cases that require the involvement of both manual and automated testers
- Test optimization – eliminating redundant test cases

Using AI \ ML technologies, the company can add intelligent decision-making to their software testing process.

ML at test creation

Machine learning is a new way to build tests in a matter of minutes instead of hours or days. It uses a data-driven approach where the system builds ML models in the background and then predicts the outcome of the test case based on the ML model. The system then builds ML models in the background. It creates a test case on the fly, records it and stores it for future use.

ML at test analysis

AI and Machine Learning algorithms can assist in test analysis and eliminate human error. They are programmed to provide a more thorough analysis of your software, looking at what is happening at the code level and providing you with a list of defects or errors.

The AI and Machine Learning algorithms can do that by looking at what has changed and comparing it against previous test runs to find any defects. AI and ML algorithms can shorten the time to run tests by not simply comparing against previous tests but by doing an in-depth analysis of software. This means that you no longer need to specify the specific test condition to find and report a defect.

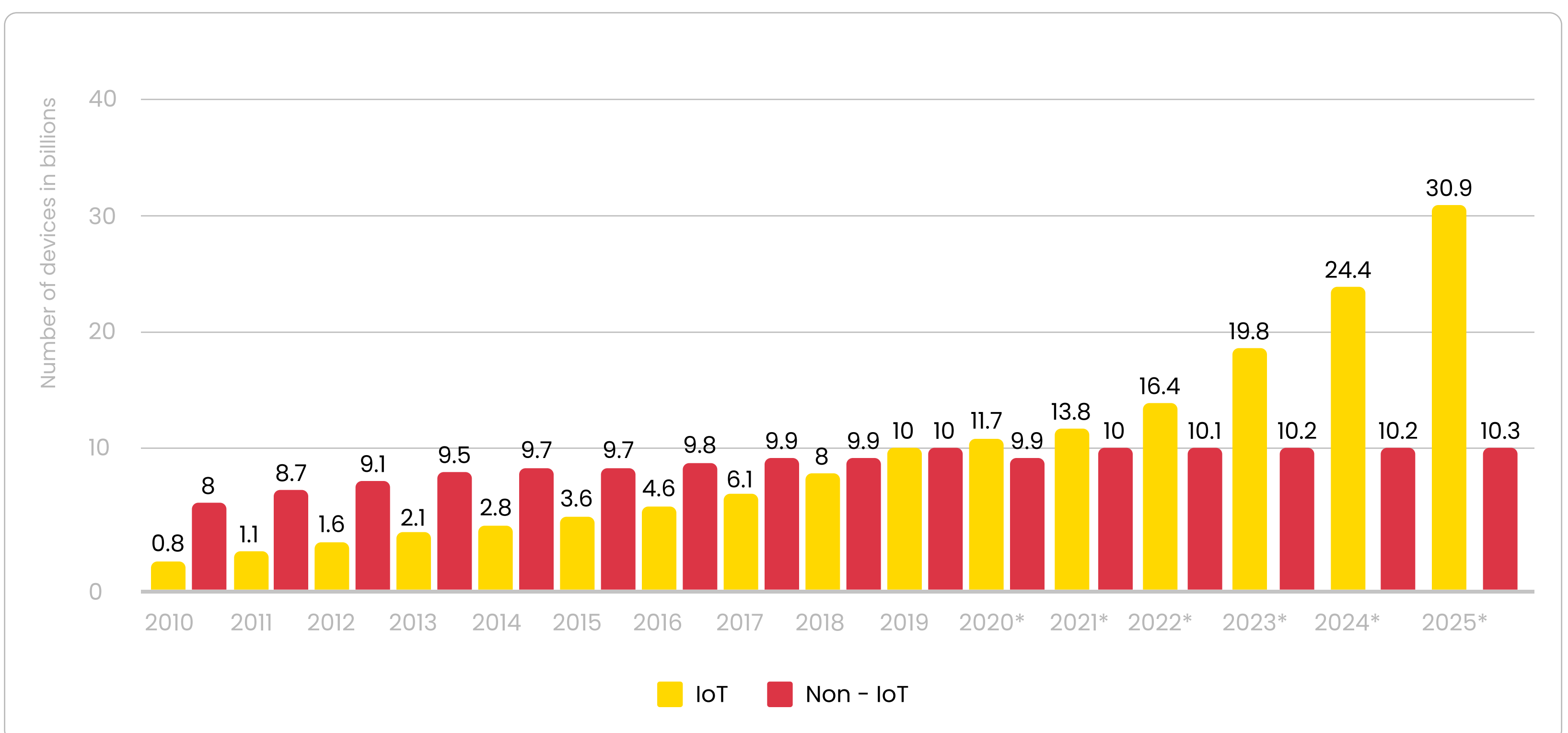
ML in test maintenance

As the development of machine learning and artificial intelligence continues, there is a growing demand for AI to assist in the process of test maintenance. Machine learning can identify faults, but it is not limited to it.

Machine learning can build algorithms to find patterns and predict what will happen. This is especially helpful where elements—or selectors—change or move. For example, when a selector changes, machine learning can identify that by looking at the old selector in the system and the new selector in the system. The AI can understand that the selector has changed and select the correct one.

Internet of things

The Internet of Things has created a new, massive market for companies to tap into. According to [Statista](#), the number of IoT devices connected to the internet is growing exponentially in the next few years. In 2019, there were about 10 billion IoT devices connected to the Internet, and by 2023, this number is going to reach 19,8 billion, and by 2025 — about 30,9 billion.



IoT is a new way of connecting devices to the internet. These devices give the user control and a range of benefits, such as automation, security, and data sharing.

However, the needs of an IoT company differ from that of a traditional software company. For example, some of the most important activities are debugging, verifying the deployment, monitoring, and investigating crashes. These activities often need to be integrated into stories, hence taking up time that could have been better spent on development.

Companies are looking for ways to use these devices to their advantage. One way is to use them in the testing process. The IoT's newfound popularity has led to a higher demand for software testing and QA professionals to keep pace with the ever-expanding product portfolio.

Business modernization

The Internet of Things is used in many industries, such as automotive, healthcare, and retail. IoT technology is a way to improve the efficiency of business processes, while also improving customer satisfaction.

IoT-based test automation is becoming an important part of business modernization and the supply chain process. IoT testing is ensuring that the IoT solutions are meeting the requirements and that they are functional, secure, and compatible with existing systems and networks.

Better engagement

With IoT, you can get a better user experience by building a comprehensive test automation strategy that covers all key channels. The way you can do that is with a range of test automation capabilities, such as new functionality and testing across devices, testing on the web, and testing on mobile devices.

IoT testing can help you measure the effectiveness of your IoT project by ensuring that end-users get a top-class user experience across multiple channels (device, web, mobile).

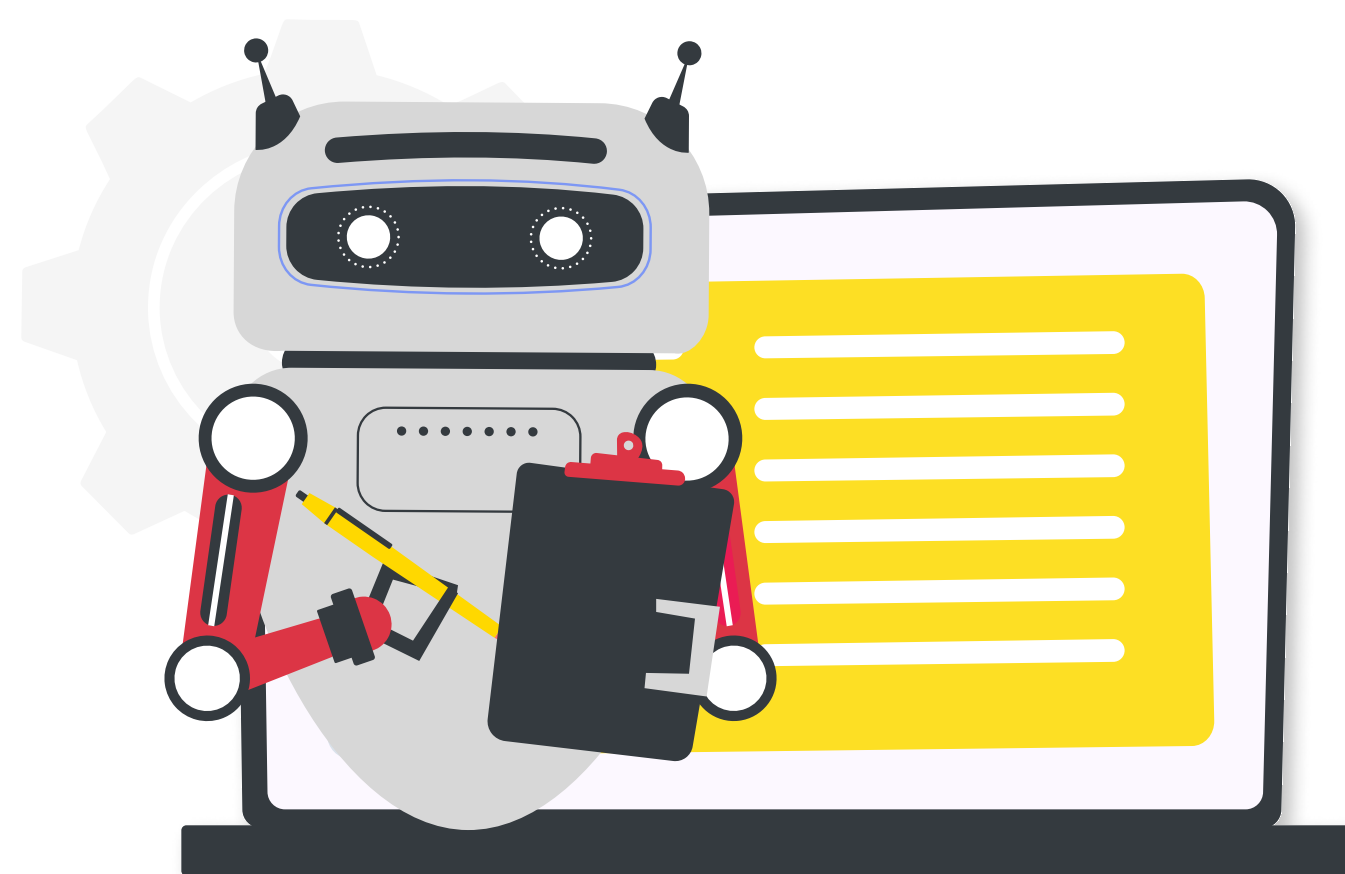
Quick time-to-market

IoT testing allows you to use your automation to build and deploy your product. It can also speed up your time-to-market. With IoT, you can start testing your product with a small, affordable, and reliable device that gives you instant feedback about your product's app. This technology allows you to automate your test processes, reduce manual testing, and shorten the time to market.

Robotic process automation (RPA)

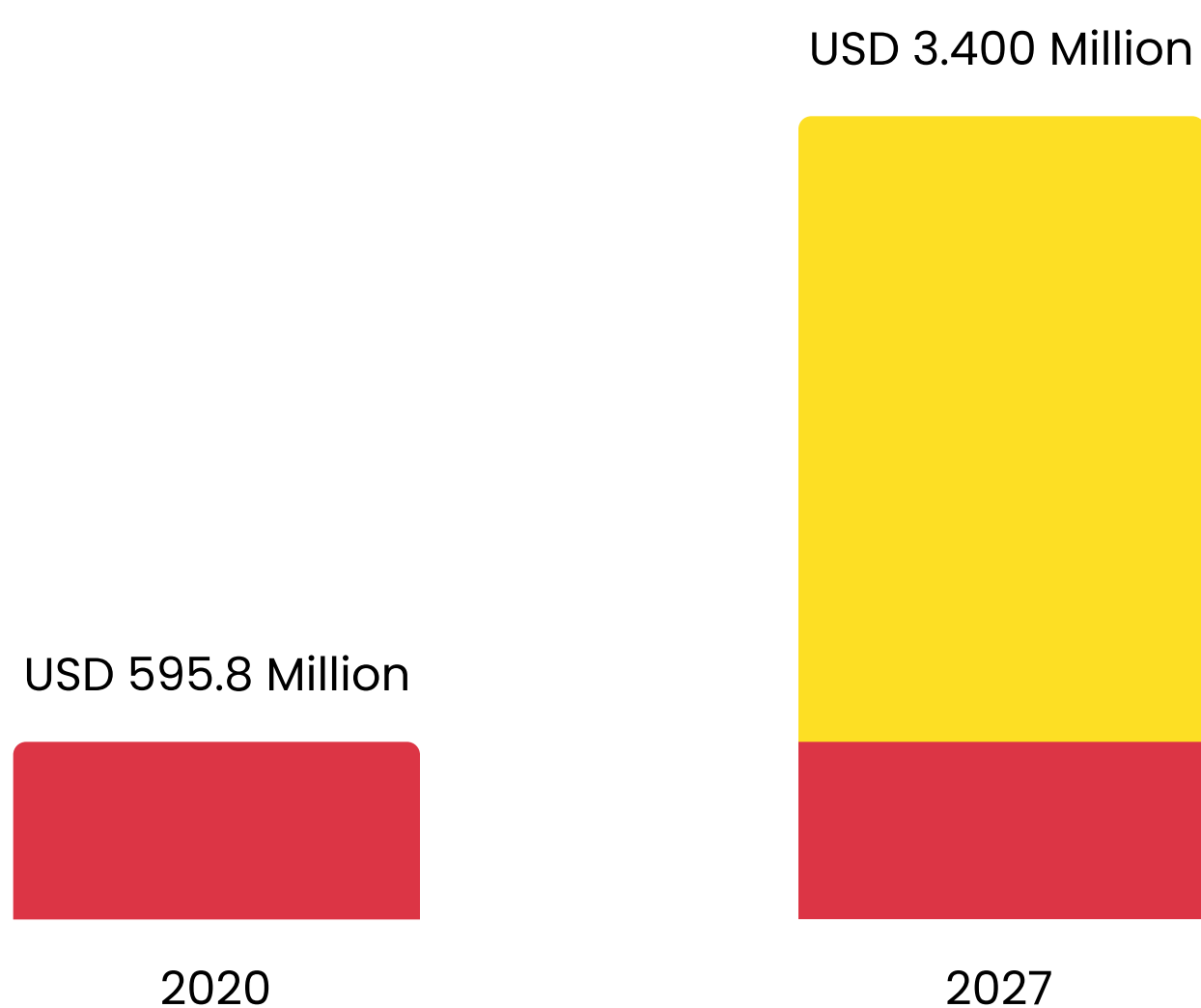
Robotic process automation, or RPA, is software that automates the business processes, with the help of a robotic software agent, to execute them. The RPA software agent performs the same task as a human, requiring no human intervention. This software agent is a piece of software that can be programmed to do a specific task, and it is then run on a robotic hardware device that can be deployed in many locations.

During the Covid-19 pandemic, the global RPA market was estimated at [\\$595.8 million](#) and is expected to reach \$3.4 billion by 2027, with a CAGR growth of 28.2% over 2020-2027 period.



Global Market for Robotic Process Automation

Market forecast to grow at CAGR of 28.2%



Quick time-to-market

The biggest concern in automation is the risk of data leakage. But because robots are programmed to work on a granular level, there is no worry of information leaking from one part to another. In addition, the different parts of the bot are well-separated and documented. So, the robot successfully accesses, controls, and documents the data.

Using RPA can improve the security and efficiency of your business processes by reducing the number of human touches required to process personal data. In areas with strict personal data regulations, the use of RPA provides beneficial opportunities for reducing the number of human touches businesses require processing personal information.

Scalability

If your business is experiencing a surge in orders, you may need to scale up your workforce to handle the increased demand. This is where robotic process automation (RPA) comes into play. With RPA, a business can minimize the time invested in onboarding employees. The business can simply onboard employees who need to handle the tasks that are necessary for the process, rather than having to hire new ones from the ground up.

Improving customer experience

A recent study found that businesses with a customer service center that was fully automated had a customer satisfaction rating that was almost double that of businesses without.

In order to improve customer service, companies often implement administrative tasks that require a large amount of time and attention from employees. By spending less time on them, companies can improve their customer experience and decrease the number of disputes that occur. As a result, customer satisfaction and resolution times will improve, and disputes will decrease.

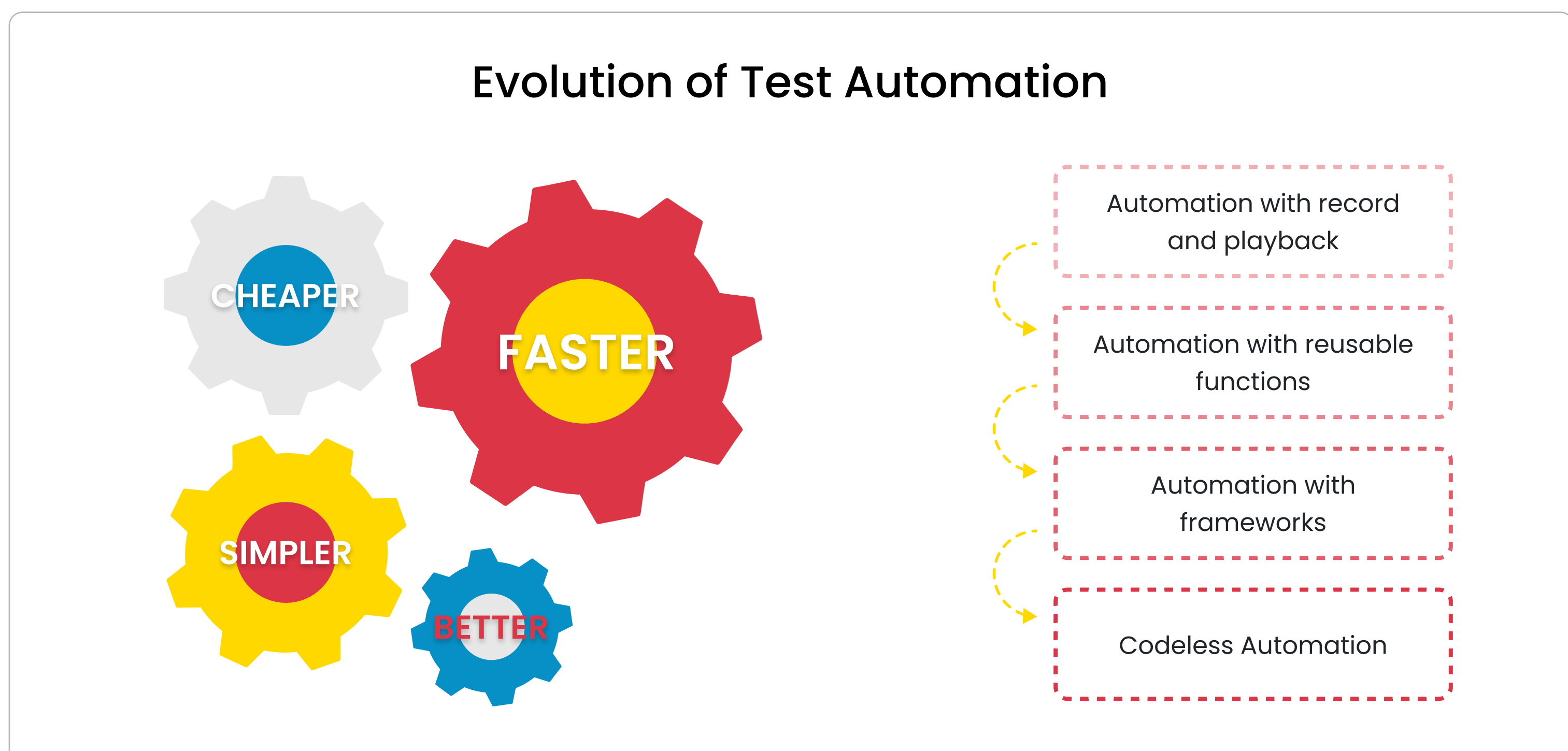
Recent [studies](#) have shown that AI and RPA solutions can reduce the amount of time managers spend on typical service processes by 40% by 2027. Consequently, businesses with a fully automated service center have a customer satisfaction rating nearly twice as high as companies without one. In a future where customer service can be handled by robots, customer service would be a one-man job instead of a team effort.

Codeless automation

Code-free automation is a software testing approach that eliminates the need to write thousands of code lines, regardless of the application's type and size. It maximizes testing efficiency, reliability, and stability across the SDLC process.

It is an automation method that uses scripting code to define the test cases and automate the execution of these test cases. There is no coding involved and no need to install any tools. Also, codeless automation can apply to both manual and automated testing. It is an agile, cost-effective, and robust approach that can apply to any software testing project.

According to the [Future Market Insights \(FMI\)](#) report, codeless automation showed exponential growth in 2021, and the overall market value was estimated at \$1.5 billion. By 2031, it is expected to increase by 15% of CAGR. Codeless automation is used in software for different industries, such as Telecom, Bank & Finance, Retail, Government, Education, Manufacturing.



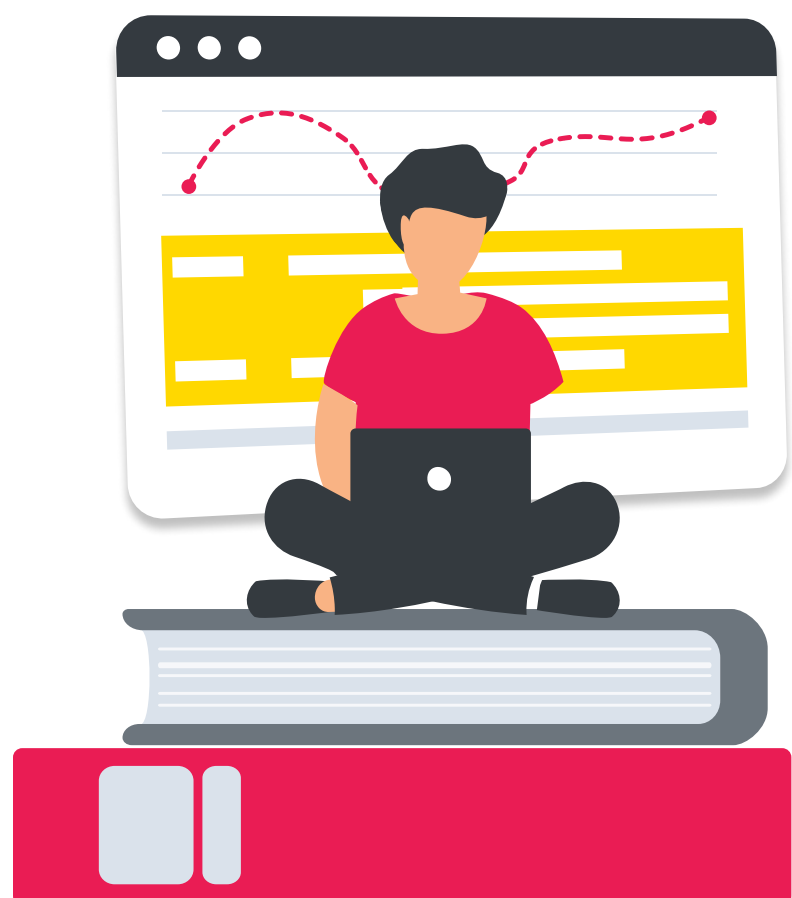
Codeless automation testing tools come integrated with AI or ML. As per Software testing trends for 2021, at least 38% of global organizations have introduced AI or ML in their testing efforts. These tools are faster, agile, and customizable and have automated workflows that help avoid repetitive testing.



Lower maintenance costs

It's easy to forget how much time and effort goes into maintaining tests. For example, it's easy to think of writing tests as a one-time event. But when you write a test, you are really setting up a test automation workflow that needs to be maintained.

In order to make your automation workflow easier to maintain, you can use codeless automated UI flows that are written to follow modern business rules and best practices.



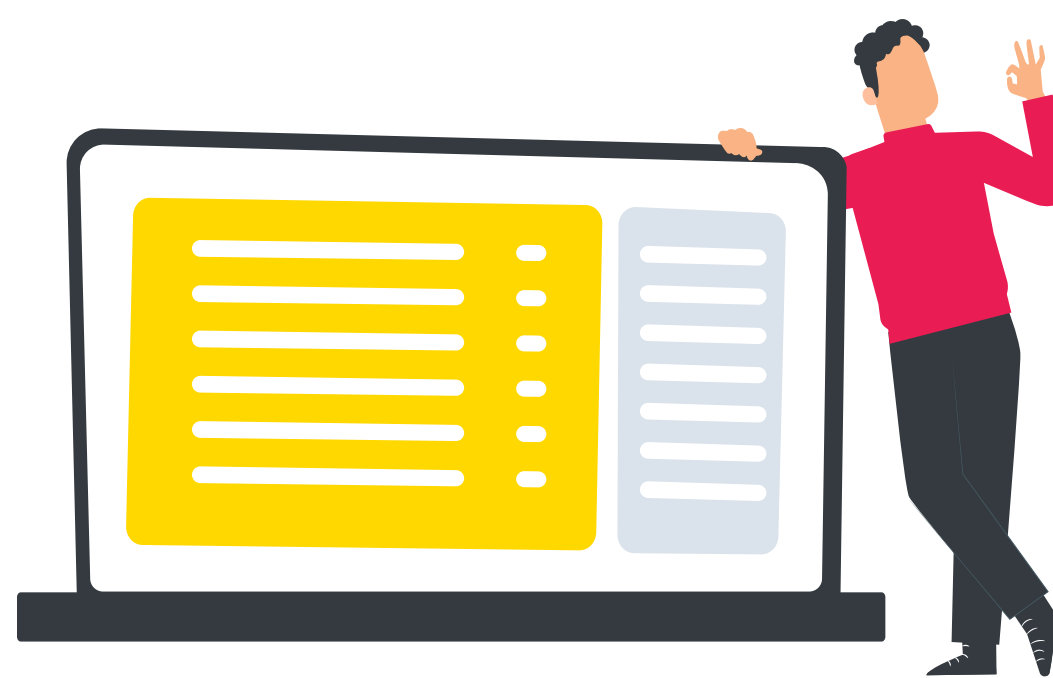
Smooth learning curve

With testing, many people worry about the learning curve. However, with codeless automation, you can get to where you're testing with no coding experience. Codeless automation tools allow you to perform a series of actions and tests without having to write the code yourself.

This is imperative for junior testers who don't have any experience with the language or background. With codeless automation, you can focus on the actions and tests that you want to run, and the tool will handle the code for you.

Easy to review

The codeless automation test cases can be generated in a much easier and more readable format than if one wrote them by hand. Therefore, these test cases can be easily reviewed by people who do not understand how to code. This can be useful when you have to share the project with stakeholders who have a minimal understanding of automation.

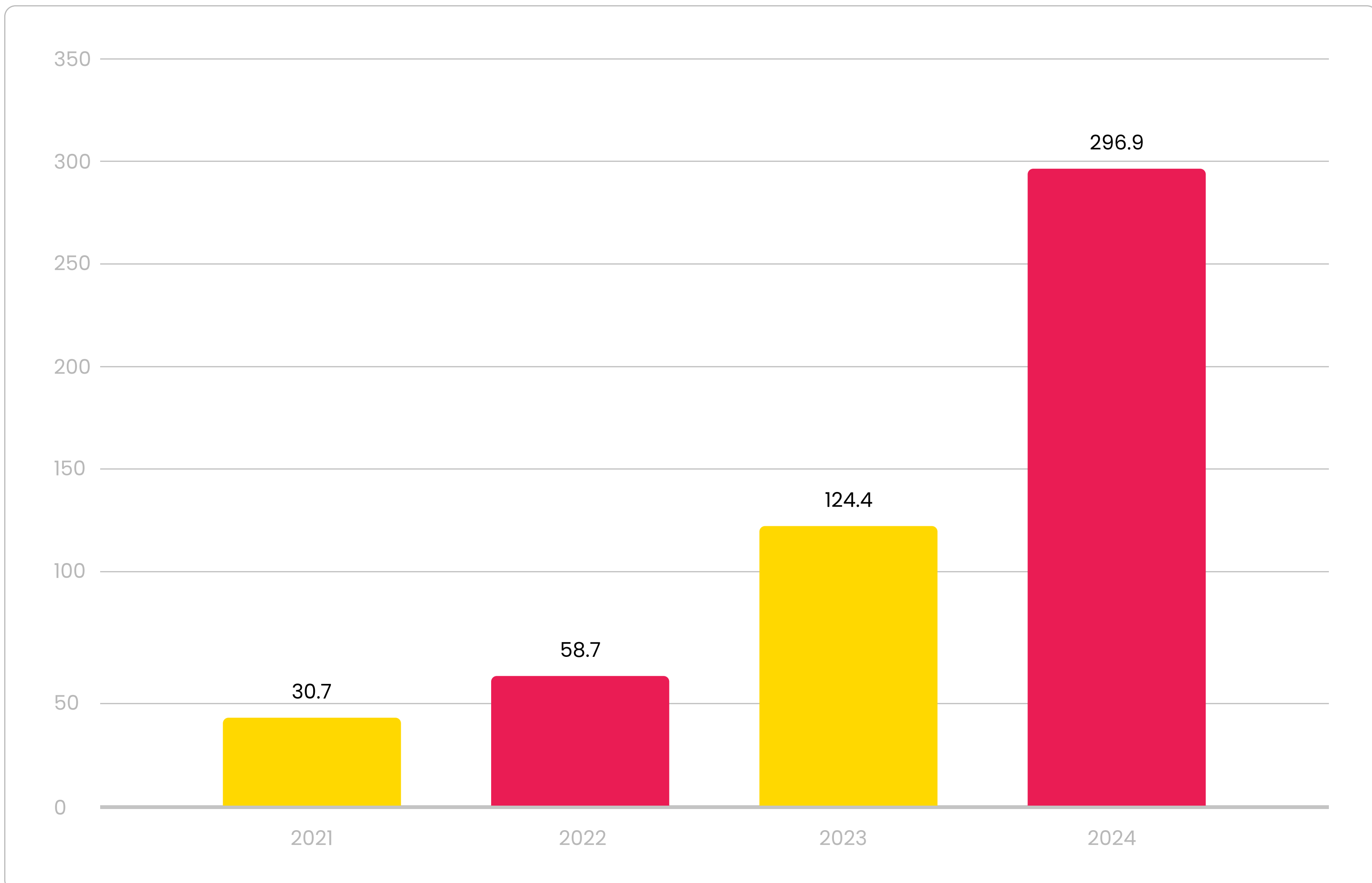


AR \ VR testing

AR \ VR testing is going to become the most dominant testing trend in 2023. It is already being used in a variety of industries, including healthcare and education. AR \ VR testing allows testers to create and share their designs in an environment that simulates a real-life situation, making it easier and faster to test.

Game developers have already used AR \ VR testing to test their products and make sure that they can be enjoyed by people with different disabilities.

According to research, 83.7 million U.S. residents used VR and AR at least once a month in 2020. It is projected that in 2023, the number of users of these technologies in the U.S. will reach more than 110 million. The global augmented reality (AR), virtual reality (VR), and mixed reality (MR) market are going to reach 30.7 billion U.S. dollars in 2021, rising to close to 300 billion U.S. dollars by 2024.



Strong collaboration between Dev and QA team

In a traditional research setting, there is a divide between the development and QA teams. This is because each team has a different idea of what is correct and what should be changed in the images. AR \ VR testing benefits when both teams collaborate on what is correct in the baseline images and discuss changes as a team. It is a great way to speed up learning.

Improving usability

Making your product more usable is critical to its success. AR \ VR pre-production testing with your target audience includes understanding how users interact with your technology and whether it makes sense for your audience.

You can also use your pre-production testing to determine if the use case you selected for AR or VR makes sense. This can help you refine your product and help you determine what features to add to improve usability. In addition, you can use preproduction testing to receive actionable feedback on how users interact with your product

Immersive testing

Space is limited. AR \ VR testing is a way to help you make the most of the space you have. With a professional VR testing service, you can quickly and easily see how much space is necessary around an individual who is using VR. This is a great option for companies that have many people using VR, as it allows them to make the design of the environment more flexible so that more people have a pleasant experience.

5 tools for automation testing in 2023

Deepcode.ai



Deepcode.ai is one such example of a company using AI to take on the role of code review. Their project is an example of how deep learning is enabling more effective automation for testing.

It uses symbolic AI for making code review and implementing good coding practices. With this tool, deep learning is used for analyzing the code and finding potential security vulnerabilities in the application.

The AI Code Review service automatically detects issues present in any open-source repository. In several cases, we automatically identify a specific category for an issue, but many defects cannot be categorized automatically.

This is because the code review service can't determine how a defect affects the system and its users. For example, a defect that is categorized as a memory-related issue may be classified as a security issue, even if the defect affects both the user and the system.

Applitools



Applitools is a visual automation testing platform that aims to make automation testing easy and accessible for everyone. It allows you to automate your testing for any application, framework, or language and work with any test environment. It's also easy to set up and integrate with your current tools and frameworks. With Applitools, you are able to automate and monitor your visual testing and debugging tasks.

With Applitools, you can leverage visual AI to capture functional and visual bugs that would otherwise slip into production. Visual AI replicates the human eyes and brain, instantly spotting functional & visual regressions while ignoring differences that don't matter. Applitools also has a built-in feedback system, enabling you to see how your customers are interacting with features, and what they find most valuable.

Perfecto Scriptless (Testcraft)



Perfecto Scriptless, formerly known as TestCraft, is a functional UI testing tool for automating testing of web applications, easing the test-creation, execution, and maintenance process for any skill level. Teams of any skill level can create stable automation quickly with support from a fully adaptive artificial intelligence system.

Perfecto Scriptless is a test automation tool that is built for functional UI testing of web applications. It automates functional UI testing of web applications. This is the perfect tool for the teams who want to create and execute functional UI tests that are stable and accurate. It is easy to use and easy to get started with.

Perfecto is one of the fastest and most stable functional GUI test automation tools on the market. With AI support, it can help to automate functional UI tests in a way that is not possible by hand.

Katalon



Katalon Studio provides an easy-to-use interface for codeless automation testing. It is a codeless automation framework for web, desktop, mobile, and API testing. It uses a simple, drag-and-drop interface that lets you record, save, and playback your test steps.

Katalon provides a variety of capabilities so that developers can create and manage automation code at runtime. It also offers a full product lifecycle and collaborative development process. This product enables developers to create, manage, and extend automation code at runtime. It also enables collaboration with colleagues and co-workers on changes to automation code at runtime.

The software is highly customizable to support a variety of testing needs, including usability testing, business, and functional testing, integration testing, and performance testing. It also features an extensive selection of built-in keywords and dualscripting interfaces that enable you to write advanced test scripts effortlessly. Katalon Studio supports a wide variety of testing needs and easily integrates with existing software.

Mabl



The Mabl platform is built for software teams who want to test their software in a DevOps pipeline where automated tests are executed on a dynamic infrastructure. It is an open-source, cross-platform, cloud-hosted software test automation platform used for testing the software in the software development pipeline, and it enables the software development m to improve their software quality and speed.

Mabl makes it easy for software teams to automate their testing and improve the quality of their designed applications. It has been designed to be easy-to-use and to reduce the development time, increase test coverage, and improve the quality of designed applications. It has a wide range of supported platforms and languages that enables software teams to create complex testing processes in minutes.

It is a powerful toolkit with a robust interface that not only helps software teams generate automated test cases but also helps them identify issues and compare results for improvement. Mabl enables software teams to work more efficiently by reducing the development time, increasing test coverage, and improving the quality of designed applications.

Conclusion

We hope you enjoyed our e-book about software testing market in 2023. Technology is changing at a rapid pace, and software testing is no exception. We hope that this white paper has helped you to understand the future of software testing, and that it's given you some insight into what to expect for the next few years. Please reach out to us anytime if you have any questions or feedback. We would love to hear from you!

Thanks for reading!

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