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What Tools do You Need to Automate Video Game Testing?



Sergey

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Test Automation Frameworks

Test Automation Tools

Types of Automation Testing



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According to Statista, the global video game market was estimated at \$155.89 billion in 2020. Their forecasts show that it will grow by \$112.92 billion by the end of 2025. These numbers reflect the degree of user involvement in the gaming industry and the interest of companies in its development. Absorbing interactive digital content, many people do not even think about how long and difficult paths the studios go through: from generating ideas and concept planning to the final release of games and add-ons.

Whether it's an AAA project or a simple web app, developers still give their best. The coding process requires team involvement as well as design and graphics. But even perfect code and a greatly rendered world do not solve the main problem of game development, bugs. To identify and eliminate them, it is necessary to involve additional forces interested in the result. Such specialists are called the QA department, testers, bug reporters, etc. Their task is to detect each serious mistake and prevent it from remaining in the next development sprint. Their work is evaluated on the final release.

We often receive questions about game testing automation tools and how the testing process works. Today the ZappleTech expert team shares 5 helpful tools for solving these problems. We will consider methods for finding bugs in video games because there are some little differences from classical testing.

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Video game testing: techniques, problems, and challenges

The QA team uses [well-known working tools](#), universal scenarios, and standard methods when testing programs and web apps. This combination practically eliminates the chances of bugs getting to the final release. In game development, the situation is more interesting. The concept of video games, and even more so, their modern format, implies a complex creative process and a large number of non-trivial problems that may arise during development. To track and eliminate these issues, QA testers use both native tools built into the engine and third-party game testing automation tools.

When it comes to video game testing, QA teams rely on a variety of video game testing tools to ensure a smooth and bug-free gaming experience. These tools help testers identify, track, and fix bugs efficiently, ensuring that the final product meets high-quality standards. The process involves a combination of manual and automated testing methods to cover all possible scenarios and edge cases.

Manual testing in video game development often includes exploratory testing, where testers play the game to find bugs that automated tools might miss. They also perform regression testing to ensure that new updates or changes do not introduce new issues. Automated testing, on the other hand, utilizes scripts and specialized software to run repetitive and extensive tests quickly, covering a large portion of the game's codebase.

Some popular video game testing tools used in the industry include:

1. **Selenium:** Although primarily used for web applications, Selenium can be adapted for testing web-based games.
2. **Appium:** An open-source tool for mobile game testing, allowing testers to write tests for iOS and Android platforms.
3. **TestComplete:** A comprehensive tool for automated UI testing, supporting various game development frameworks.
4. **Unity Test Framework:** Built specifically for Unity games, this tool allows for

both unit and integration testing.

5. **Unreal Engine's Automation Tool:** Used for automating tests in games developed with Unreal Engine.

Each of these video game testing tools has its strengths and is chosen based on the specific requirements of the game being developed. By combining manual and automated testing methods, QA teams can ensure that all aspects of the game are thoroughly tested, from graphics and performance to gameplay and user interface.

The complexity of modern video games requires a meticulous approach to testing. Video game testing tools play a crucial role in this process, enabling QA teams to deliver high-quality, engaging, and bug-free games to players worldwide.

Testing methods: goals and objectives

The QA process for video game testing is similar to that in software and web apps, with one significant difference: the disproportionately large amount of data to test. Modern games can vary in size, often reaching up to several hundred gigabytes. This vast amount of data primarily consists of graphic content, including textures, models, videos, and images. The remainder comprises code, libraries, and scripts, collectively referred to as the back-end, which contains the functional part of the project. The video game testing process begins with the verification of this back-end data to ensure all elements function correctly before moving on to other stages.



Use a combination of video game testing tools like Unity Automated Testing, Unreal Engine Automation System, Appium, and Selenium. Each tool offers unique strengths, and using them together can provide comprehensive coverage for different aspects of game testing.



Mykhailo Poliarush
CEO, ZappleTech Inc.

Video game testing tools play a crucial role in managing this extensive data and ensuring a thorough QA process. These tools help testers efficiently handle the large files and complex structures inherent in video games, ensuring that both the graphical and functional components of the game are thoroughly vetted. By leveraging specialized video game testing tools, QA teams can identify and address issues more effectively, leading to a more polished and stable final product.

- Functional testing. This method helps to check the health of each back-end component, from the start and exit buttons to scripts and the relationships between them. Usually, it is done by standard tools or third-party [utilities like Selenium](#).
- Combinatorial testing. In this technique, the goal of QA is to search for bugs in the finished code from the early development stages. During the test, various combinations of input data are considered for compliance with the final result described in the test case.
- Exploratory testing. Creative thinking and an unconventional approach are used here. No pre-formed conditions and tasks. It is an effective method that detects specific bugs and errors at any development stage, which would have gone unnoticed in the case of classical testing.
- Compatibility. It is a trivial but necessary test, where the software is examined on different systems. It is very costly to assemble stands, so some technical characteristics are emulated in a virtual environment. Based on the results, "horrific" system requirements are formed as well as the recommended hardware and OS for the good operation of the game.
- Clean room method. It is used to "catch" bugs and find their source. If it is impossible to trace the cause of the problem by conventional methods, testers try to localize it to study it in more detail and eliminate it.
- Game testing. It is a pleasant side of game development, in which QA specialists arm themselves with controllers and plunge into the wonderful game world. This method detects visual content problems, script failures, or incorrect variable values. This custom scenario identifies non-standard troubles with a non-linear approach to the gameplay, eliminating them before release.
- Regression tests. As with software or web apps, regression testing is launched after each sprint, simultaneously with the main one. Its goals are the same: to prevent new bugs during code modernization, i.e., track, localize, and eliminate them.

These 7 techniques are actively used in game development of all formats and volumes. The ZappleTech team uses them in their work as well since they are equally [effective in detecting bugs](#) in AAA projects and small web apps with 2D/3D gameplay. Some of them require manual interaction only, while others can be automated. Contrary to popular belief, it does not free QA specialists from routine but speeds up the tedious process and shifts their attention to priority tasks. There are many game testing automation tools, some of which we will discuss below.

Game testing automation tools: 5 ways to optimize routine

Although the principle of testing video games is not fundamentally different from working with apps, there are still differences, often found in the finer details and in the tools used. Video game testing requires specialized approaches due to the

complex nature of games and the vast amounts of data involved. Developers typically use their own utilities based on the product engine to run various tests. However, these internal tools are often insufficient for deeper code analysis or identifying low-level problems, necessitating the use of additional video game testing tools.

These video game testing tools are essential for thorough quality assurance. They provide advanced functionalities that internal utilities might lack, enabling testers to perform comprehensive analyses. This is crucial for identifying and resolving issues that could affect gameplay, graphics, or overall performance. All tools from this top list are popular among testers of all levels, ensuring that both novice and experienced QA professionals can effectively use them.

Our ZappleTech QA specialists have also mastered these video game testing tools and actively use them in practice. By integrating these tools into our testing processes, we ensure a higher standard of quality and reliability in the video games we test. This comprehensive approach to video game testing helps us deliver more polished and stable games, enhancing the overall gaming experience for players.

Unity Automated Testing

Unity is not just a desktop and mobile video game engine; it is also a powerful Development Kit used for developing and testing products. Its indisputable advantage lies in the ability to connect third-party frameworks, create custom ones, and work in the cloud. This capability optimizes the process of identifying non-working elements, making Unity Automated Testing highly efficient. Scenarios can be written in the format of user interaction with the interface or at a lower level through the forced launch of individual code elements.

Due to the tool's specificity, Unity Automated Testing is primarily used for projects developed on its own engine. This engine has become quite popular in the video game market, making Unity Automated Testing a valuable asset for developers. By leveraging Unity's capabilities, testers can thoroughly analyze both the graphical and functional aspects of a game, ensuring a seamless gaming experience for users.

Video game testing involves various stages, and utilizing robust video game testing tools like Unity can significantly enhance the quality assurance process. These tools allow testers to handle the intricate details of game development, from graphics to backend functionality. By incorporating such advanced video game testing tools, QA teams can identify and rectify issues more efficiently, leading to more polished and reliable video games.

Unreal Engine Automation System

Similar to Unity, Unreal Engine is widely used for creating many AAA projects and, more recently, MMO universes. Its Development Kit (DevKit) includes ready-made libraries, textures, scripts, models, and other elements, allowing even novice developers to join the work, albeit with some limitations. When discussing the game testing automation tools system in Unreal Engine (UE), the mechanics are not much different from other utilities.

Using the built-in automator in Unreal Engine, **testers can identify performance problems by examining graphics and user scripts.** Video game testing with Unreal Engine's automation tools is highly effective, as it allows tests to be conducted both in the background and within the game. This dual approach increases the chances of detecting atypical bugs related to rendering or in-game functions, which might not be evident through standard testing methods.



With the growing trend of cross-platform and cloud gaming, ensure that your testing includes various devices and browsers. Tools like Selenium can help you identify compatibility issues, ensuring a seamless experience for all players.

Sergey Almyashev
COO, ZappleTech Inc.

Video game testing tools like those found in Unreal Engine play a crucial role in ensuring the quality and performance of a game. The ability to perform automated tests that consider both graphical performance and user interactions is invaluable. These tools help QA teams to catch and fix issues early in the development process, leading to a smoother and more enjoyable experience for players.

By integrating such sophisticated video game testing tools, developers can maintain high standards of quality assurance. Whether dealing with massive multiplayer online (MMO) games or intricate AAA projects, the use of Unreal Engine's automation system ensures comprehensive testing coverage. This results in fewer bugs and a more polished final product, showcasing the importance of robust video game testing in the development cycle.

Appium

Appium is a versatile mobile game testing automation tool that is used successfully in QA for both apps and video games. Its comprehensive toolkit allows testers to work with both code and visual elements, making it a valuable asset in the gaming industry. Appium is particularly effective for testing mobile apps developed for iOS and Android platforms.

In the realm of video game testing, Appium stands out for its ability to simulate user scenarios that imitate human actions. This capability is crucial for ensuring that mobile games function correctly across various devices and operating systems. By testing products using these user scenarios, Appium can identify and help resolve issues that might affect the user experience.

Video game testing tools like Appium are essential for maintaining the quality and performance of mobile games. They enable QA teams to conduct thorough and realistic tests, covering a wide range of potential user interactions. This level of detailed testing is vital for detecting bugs and performance issues that could otherwise go unnoticed until after the game's release.

Appium's ability to test both the code and visual elements of a game makes it a comprehensive solution for mobile game testing. Its use of automated testing scenarios ensures that games are rigorously vetted, leading to a more polished and reliable final product. In the competitive world of mobile gaming, utilizing advanced video game testing tools like Appium can make a significant difference in a game's success, providing players with a seamless and enjoyable gaming experience.

Selenium

Selenium is a popular game testing automation tool primarily used for testing web apps. However, its capabilities extend far beyond the usual tests of APIs, software shells, frameworks, and code. With the rise of cross-platform and cloud gaming, Selenium has become an invaluable asset for video game testing, helping QA specialists find and localize game bugs that could impact the user experience.

Selenium's unique set of features allows it to work with JavaScript (JS) and Python, supporting all browsers and internet platforms. This versatility makes it an essential tool for testing web-based games and applications. By leveraging Selenium's capabilities, testers can ensure that games function correctly across different browsers and platforms, providing a seamless experience for players regardless of their chosen device or browser.

In the context of video game testing, Selenium is particularly useful for identifying issues related to cross-platform compatibility and cloud-based gaming environments. Its robust automation capabilities enable testers to simulate various user interactions and scenarios, uncovering potential problems that might not be detected through manual testing alone.

Video game testing tools like Selenium play a crucial role in maintaining the quality and performance of web-based games. By automating repetitive testing tasks and providing detailed insights into potential issues, Selenium helps QA teams to efficiently address bugs and performance bottlenecks. This leads to a more polished and stable final product, enhancing the overall gaming experience for users.

As the gaming industry continues to evolve, the importance of advanced video game testing tools like Selenium cannot be overstated. These tools enable developers to meet the high standards expected by today's gamers, ensuring that their products are both reliable and enjoyable.

LumberYard and LY Test Tools

Game engine from Amazon. Its rich functionality allows developing AAA projects and testing them in a native environment. Thanks to the built-in tools containing a lot of utilities and editors, it provides easy checking of the product for errors. Custom scripts simulate the actions of real players in a virtual environment, while background analysis looks for problematic code blocks and saves logs in a convenient detailed form. It is useful for QA teams working with projects on the LY engine. Now its descendant, Open 3D Engine, is being actively developed, which may soon partially replace its older brother in terms of functionality of built-in game testing automation tools.

These programs and tools are profiled but very viable in testing video games at every development stage. While the native utilities of game engines are mostly limited to their environments, Selenium and Appium are cross-platform and multifunctional products. They are used in developing software, web apps, and games.

Our experts have been working with tools for many years and are constantly monitoring updates. If you need advice on QA issues, please contact our managers. We also provide services for testing your products, join at any development stage, and make projects perfect.

Conclusion

Automating video game testing is essential for ensuring the high quality and performance of modern games. With the vast amount of data involved and the complex nature of game development, leveraging the right video game testing tools can make a significant difference. Tools like Unity Automated Testing, Unreal Engine Automation System, Appium, and Selenium offer robust solutions for various aspects of game testing, each bringing unique capabilities to the table.

- **Unity Automated Testing** excels in projects developed on its own engine, providing the ability to connect third-party frameworks, create custom ones, and work in the cloud. This allows for thorough testing of both graphical and functional components, ensuring a seamless gaming experience.

- **Unreal Engine Automation System** is invaluable for AAA projects and MMO universes, offering built-in automators that test both in the background and within the game. This dual approach helps detect atypical bugs related to rendering or in-game functions, enhancing the game’s stability and performance.
- **Appium** is a versatile mobile game testing automation tool that simulates user scenarios on iOS and Android platforms. Its ability to test both code and visual elements ensures comprehensive coverage, leading to a polished and reliable final product.
- **Selenium**, while primarily used for web apps, has proven its worth in video game testing, especially with the development of cross-platform and cloud gaming. Its support for JavaScript and Python, along with compatibility across all browsers and internet platforms, makes it a powerful tool for identifying and localizing game bugs.

Automate repetitive testing tasks to save time and resources. Tools like Appium and Unity’s automation capabilities can simulate user interactions and perform extensive testing quickly, allowing your QA team to focus on identifying and resolving more complex issues.

Mikhail Bodnarchuk
CDO, ZappleTech Inc.

In conclusion, automating video game testing with the right tools is crucial for delivering high-quality, bug-free games. These video game testing tools streamline the QA process, allowing developers to efficiently address issues and ensure that their games meet the high standards expected by today’s gamers. By integrating these advanced tools into your testing workflow, you can achieve a more polished, stable, and enjoyable gaming experience for your audience.

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