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FEATURES OF WEB APPLICATIONS TESTING

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The article is devoted to the peculiarities of testing web applications. The principles of testing web applications, similarities and differences in testing with desktop and mobile applications are considered. Results of site testing are represented.

Nowadays the Internet has entered into all spheres of users' lives. Working online has several advantages.

Web-based products take up very little space on the client machine, are accessible from any device connected to the Internet, and are updated regularly, allowing users to receive the latest data [1].

Based on the number of developed sites and users they use, it becomes clear why so many new web applications are being developed in the world. This process leads to the need to attract a large number of specialists.

Cloud technologies are becoming a new reality of the modern Internet: even the once familiar desktop Word and Excel today are represented as web alternatives from Microsoft.

The difference between testing desktop applications and the web is that they do not need access to the Internet [4]. When testing web applications, the same classical methods and techniques for designing tests are applied.

Web-testing involves a number of issues that usually do not arise with traditional desktop application testing. Examples of specialized web-based testing are things like: testing browser compatibility, testing web accessibility, checking for "broken" links, and also tracking messages between the client and the server. Many resources and web development tools are different from those used for other technologies.

Web-applications are a dynamically developing sphere [3]. Not all approaches and methods used to test classic applications can be applicable to testing Web applications. Since the web application is a client, a server application in which the browser acts as the client, and the web server as the server, which is already essentially two different sex programs that need to be tested both separately and in a bundle.

Almost all modern programs are oriented to work with the network. The data storage of web applications is carried out, mainly, on the server, information exchange takes place over the network.

When a user sees an error in the network environment, it is often difficult to accurately indicate exactly where it occurred, and therefore the mode of operation, or the error message that it receives, may be the result of errors that occurred in different parts of the network system.

To organize the testing of the website, a specially developed methodology is provided, according to which the verification is carried out [5].

Having much in common with testing classical applications, testing web-oriented applications has its own peculiarities, primarily related to the environment of functioning. Having component, structural and technological features, web applications are characterized by features of operating modes, speed, start, stop and delete, and the formation of an interface.

Working always with a network and with a large number of users, web applications imply different permissions for different users.

One of the advantages of testing web applications is the fact that clients do not depend on the specific operating system of the user, so web applications are cross-platform services.

Such software products, as a rule, have three levels, you can interact with them using a web browser. Testing websites and applications is complex, testers should consider all the features of the system, check all levels. Levels of web applications are web browser, server, database server. Specialists who perform manual and automated testing know that such products are usually written in programming languages: Java, JavaScript, PHP, Perl, ASP, JSP, VBScript, Cold Fusion.

Users see only the user interface that is displayed in the web browser. All operations are performed on the server, and data is stored on the database server.

Distinctive features of testing of web applications and desktop applications

1 Technology [3].

A classic application works using one or a family of related technologies.

The web application works with fundamentally different technologies.

2 Structure.

Classic application "monolithic". Consists of one or a small number of modules.

Web application – "multi-component". It consists of a large number of modules.

3 Operating modes.

The classic application works in real time, i.e. It is known about the user's actions as soon as it is completed.

The web application operates in the "request-response" mode, i.e. It is known about some set of actions only after a request to the server

4 Forming the interface.

The classic application uses relatively well-established and standardized technologies to form the user interface.

The web application uses rapidly developing technologies to form a user interface, many of which compete with each other.

5 Working with the network.

The classical application practically does not use network data channels.

The web application actively uses network data channels.

6 Start and stop [3].

The classic application runs and stops rarely.

The web application is launched and stopped upon receipt of each request, that is very often.

7 Number of users.

Classic application: the number of users using the application at the same time is subject to control, is limited and easily predictable.

Web application: the number of users using the application at the same time is difficult to forecast and can change in a wide range over a wide range.

8 Failures.

Classic application: the failure of certain components immediately becomes obvious.

Web application: the failure of some components has an unpredictable impact on the performance of the application as a whole.

9 Installation.

A classic application - the installation process is standardized and maximally targeted at a wide audience of users. Does not require specific knowledge. Adding application components is done in a standard way using the same installer.

Web application - the installation process is often not available to the end user. Installation requires specific knowledge. The process of changing the components of the application is not foreseen or requires the qualification of users. the installer is missing.

10 Uninstallation.

Classic application: the uninstall process is standardized and executed automatically or semi-automatically.

Web application: the uninstallation process requires specific knowledge for the administrator's intervention and is often associated with changing the application environment code of the application, the database, the settings of the system OS.

11 The environment of functioning.

Classic application: the environment of functioning is standardized and does not greatly affect the functioning of the application.

Web application: the operating environment is very diverse and can have a serious impact on the performance of both the server and client part [3].

To ensure high quality of the web application, you should carefully perform:

1 Functional testing.

2 Testing the user interface.

3 Testing for application compatibility in different browsers.

4 Load testing, performance testing and stress testing.

5 Security testing [2].

You need to make sure that the system correctly processes and stores data in different network conditions. User data must be protected from attacks and safely stored.

Usability testing is nothing more than testing the friendliness of the application for the user. When testing usability, it is checked whether it is easy for a new user to understand the application. In general, when testing user-friendliness, system navigation is tested.

The purpose of this test is the usability test, which is verified in the simplicity and efficiency of using the product when using standard usability testing practices.

Functional testing is testing the functionality and operational behavior of a product to ensure that they meet specifications. Testing that ignores the internal mechanisms of the system or component. It concentrates exclusively on the output data obtained in response to user input and scenario execution conditions.

The purpose of the test is to make sure that your product meets the required functional specification mentioned in your development documentation.

Compatibility testing is used to make sure that your application is compatible with other elements of the system in which it is running - for example, browsers, operating systems or hardware.

The purpose of compatibility testing is to evaluate how well the software works in a particular browser, under a specific OS, with other software or hardware.

When testing databases, the backend entries entered through the web or desktop application are checked. The data that is displayed in the application must match the data stored in the database.

Security testing is aimed at finding shortcomings and gaps in terms of application security.

Performance testing is conducted to assess the compliance of a system or component with specific performance requirements.

Common test scenarios:

1 Determine the performance, stability and scalability of the application under different load.

2 Determine whether the current architecture can support the application at peak loads.

3 Determine which configuration leads to the best performance.

4 Determine whether the response time has changed for the new version of the application.

5 Evaluation of the product and / or hardware to ensure that they meet the projected load volumes.

In general, it is impossible to perform performance testing manually, because it requires a large amount of resources, it is also impossible to perform a number of actions simultaneously, there is no suitable way to track system behavior, falsely perform repetitive tasks.

Complex testing of web applications allows:

1 Ensure correct functioning.

2 Improve usability.

3 Increase productivity.

4 Check the safety.

5 Ensure compatibility.

6 Improve reliability.

Differences between Web testing and mobile applications

1 Mobile applications are designed for more users, more diverse devices than web applications. Although the differences between these two categories of devices are decreasing as more and more web applications become available in mobile formats. A mobile application can run on multiple devices, including a smartphone, tablet, pacemaker, a locking system or a fitness tracker.

2 Web browsers were created permanently. While mobile applications must constantly perform "on the go" computing functions, web applications tend to focus on stationary portable or desktop operations, with classic mouse, cursor, or Wi-Fi router functionality that are less involved in mobile applications.

3 RAM and storage limitations. Many mobile devices still come with 1 or 2 GB of RAM, and also with a relatively small 16 GB SSD. This creates serious limitations for the RAM and the storage capacity for testing.

4 Different interactions for different users. Interactions for computers and laptops have been stabilized for more than 30 years - the mouse and keyboard is the standard for everything from working in Facebook to a flash game. This makes up the characteristics of web application testing. The problem with mobile applications is a wide range of sensory actions - scrolling, pulling, jamming, voice capabilities.

Two sites were tested: http://www.arngren.net, https://lpgenerator.ru/blog/2013/07/09/25-primerov-velikolepnogo-dizajna-internet-magazinov/#25.

Fig. 1. Example site 1

Fig. 2. Example site 2

Based on the results of testing the sites presented in Figures 1 and 2, it can be concluded that the site most convenient to use, reliable, attractive, understandable, and easy to manage is the site presented in Figure 2, since site 1 is overloaded with information and inconvenient in use.

Conclusion: Web testing raises a number of issues that usually do not arise with the traditional testing of desktop applications and mobile applications. Examples of specialized web-based testing are things like: testing browser compatibility, testing web accessibility, checking for "broken" links, and also tracking messages between the client and the server.

Testing any application, you need to understand the underlying technologies. You need to know the most appropriate tools and processes that can be used by the development team. There are no common methods for testing Web applications. For different products, their testing features apply.

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