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ARTICLE

Research on the Computer Software Testing Method Based on Multiple Platforms

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ABSTRACT

Informationization plays an important role in modern life and production. And various software is one of the bases for it. Before it goes into service, software needs to go through many steps, including software development, design, etc. In software development, test is the key to identify and control bugs and errors in the software. Therefore, software companies often test the software to ensure that it is qualified. In recent years, more attention has been paid to a multi-platform computer software testing method, which can make up for defects in traditional testing methods to improve test accuracy. Firstly, this paper illustrates the connotation and features of software testing. Secondly, common software testing platforms and their requirements are analyzed. Finally, this paper proposes software testing method based on multiple platforms.

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1. Introduction

Computer as well as Internet is one of the essential conditions in the operation of modern society. When people use them, many application software will be installed in computers. Hence, software development and testing industry emerges accordingly. To improve the quality of software, software development companies routinely test the software after designing process so as to identify bugs in it. However, due to its particularity, perfect software does not exist in reality. The more complex the software is, the more likely bugs exist. In this case, the purpose of software testing is not to eliminate all bugs, but to fix the identified problems. In order to identify more bugs, it is common to choose multiple platforms for software testing. At present, there are many platforms used in software testing, so the optimal platform should be selected according to features of software. Only in this way can we ensure that as many bugs as possible will be identified to guarantee the security of software applications.

2. The Concept and Features of Software Testing

2.1 The Concept of Software Testing

Software testing appears as software development industry develops. At the initial stage of software development, software features small scale and less complexity [1].

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There are many problems such as disordered process and randomness in the development while the corresponding test connotation is relatively narrow. Developers directly consider the testing as debugging, whose purpose is to correct the identified bugs in the software, and most developers complete the work by themselves. In this stage, software companies lack necessary attention to the testing. Meanwhile, the testing, which is relatively late, is carried out when the code is formed and the product is basically completed in most cases [2].

With further development of software industry, the software is gradually promoted to large-scale and complex development. In this stage, some basic theories and techniques of software testing are gradually formed, and people began to design a lot of flow tables and management plans for software development. The software has evolved from disordered development to structured development, mainly featuring structured analysis and design, structured review and so on. At this stage, the concept of quality is incorporated into software development and testing, so the definition of software testing changes accordingly. Testing is not simply a behavior of identifying errors, but also the main part of software quality assurance, covering the content of software quality evaluation [3].

Software testing was defined in software engineering terminology proposed by IEEE in 1983. Specifically, the process of a certain software system should be operated or measured manually or automatically. The function of software measurement is to find out whether the software meets the design requirements or to ascertain the differences between expected results and actual results [4]. This definition further clarifies the purpose of software testing. It’s no longer a one-time event, but an integral part of the development process.

2.2 Features of Software Testing

During software testing conducted by software testing platforms, relevant workers need to build a good operating environment to ensure that no trouble will appear during the process [5]. Meanwhile, software test platforms’ accuracy of results and rate of process will be improved. In addition, hidden bugs in the software can also be identified and fixed in time. Workers should be aware that the operating environment has an important impact on smooth implementation of software testing. All software should be tested before actual application [6]. However, with the rapid development of modern information technology, software updates at a very fast speed and software functions become increasingly complex. These facts greatly increase the difficulty of software testing and put forward higher requirements for software testing platforms. During software testing, for one thing, relevant workers need to compare and access the test setting for a function. For another, they also need to avoid interfering with other functions of the software. The above specifications aim to continuously improve efficiency and quality of software test platforms. With the rapid development of information technology, software testing will be applied to various testing platforms. Then the increase of platforms can improve efficiency and accuracy of software testing. It can also perform unified tests on all functions of software to maximize the value of identifying software bugs [7].

Testing principles, specifically the incomplete principle, should be followed before software testing. The incomplete principle means that if the test is not complete and there are many parts with immunity principle in the testing, it can play a positive role in the software testing [8]. Owing to immunity of such factors in software testing, there is a positive correlation between testing content performed by testers and software testing immunity. If people want to make software testing smoother and more accurate, these principles must be followed and be integrated into the whole software development process to achieve continuous testing rather than one-time whole-process testing.

3. Analysis of Software Testing Platforms

3.1 Common Software Testing Platforms

In order to meet the demands of software testing in the maximum degree, the number of platforms applied in the testing process keeps increasing. In recent years, during software testing, software testing platforms such as PARASOFT ALM RUAN, Test Center and so on are commonly used. At the early stage of software testing industry development, PARASOFT carried out various software testings and obtained remarkable fruits[9]. PARASOFT ALM RUAN, successfully developed by the company, is recognized by people among integrated software test platforms. It is mainly because of its comprehensive software testing and the application of this platform by some internationally renowned software testing companies. Test Center, as a general test platform, can perform testing for various types of software. Test Center has the advantages of strong stability and high efficiency during the application, so it is mostly used in software development. Using Test Center can greatly shorten the time of software development, thus improving

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the efficiency of software development and attracting more attention in software testing industry[10].

3.2 Requirements of the Test Based on Multiple Platforms

Based on different characteristics of software, if it is only tested by a specific platform, the obtained test results are bound to lack comprehensiveness. As the software development become more diversified and complex, software testing based on multiple platforms can better meet the development requirements of the whole industry. Software testing based on multiple platforms can effectively detect existing defects that affect user experience in application process on a single platform. During software testing based on multiple platforms, developers need to divide the software operation into various steps in advance, and gradually complete the testing on different platforms. Hence, bugs in various aspects such as functionality and logic can be identified with higher efficiency and accuracy.

4. Specific Methods of Software Testing Based on Multiple Platforms

4.1 Steps of Software Testing Based on Multiple Platforms

The first step is designing and planning, during which appropriate test methods should be chosen according to computer software requirements. The second step is building the model. The required testing model should be built by applying existing computer software testing methods. Based on the logic characteristics of computer software itself, the model building in this period should pay attention to compatibility of software operation from the perspective of logic operation, and build relevant framework to ensure that all testing methods are carried out normally. The third step is managing applications. After model building, the test tasks should be refined in combination with differences among test methods. The differences of test software should be referenced in order to detail the test methods and corresponding tasks, ensuring that all test tasks can run smoothly. The fourth step is practicing. During the operation, attention should paid to the collection of all kinds of information. Combining with the obtained information of errors, people should provide reference for subsequent adjustment of the software.

4.2 Software Testing Standards Based on Multiple Platforms

First, the balance between different platforms should be paid attention to. Given that different test platforms have different developers, it is inevitable that differences of test environments exist, which will lead to problems of software operation adaptability between people during software testing. During testing, coordination between platforms should be ensured in order to choose the best way for testing. Second, due to the complexity of the software, key monitoring points should be selected in advance to improve the efficiency during the test, and the core functions of the software should be defined, based on which the most suitable platform can be selected. In environment of testing with the help of a network platform, the identified problems should be fixed in time, then subsequent inspection should be carried out. All the testing work can be completed only when all problems are solved. Third, during the normal operation of software, its fluency will be affected by the system environment to some extent. Software can vary on different system environments during operation. In view of this, one of the premises for software testing based on multiple platforms should be a good network configuration environment.

5. Conclusion

Modern software updates quickly. Testing, as the key step of its development, requires high efficiency and accuracy. In the past, the software testing on a single platform may incompletely identify bugs or operate with relatively low efficiency. Consequently, this paper proposes software testing patterns based on multiple platforms. It can be seen from the above analysis that software testing based on multiple platforms works more efficiently and comprehensively, being able to get involved in software development in the early stage. Additionally, computer software testing method based on multiple platforms can further improve software stability if it is applied to appropriate software testing platform, thus having great significance for ensuring that the designed software meets requirements.

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