



Research and Application of Software Testing Method Improvement Based on Big Data Information

Peng Gao¹, GuoXing Chi¹, YuLing Liu², and WeiPeng Sun¹(✉)

¹ College of Mathematics and Data Science (Software College), Minjiang University, Fuzhou 350108, Fujian, China

3197102140@stu.mju.edu.cn

² New Huadu Business School, Minjiang University, Fuzhou 350108, Fujian, China

Abstract. In order to improve traditional software testing methods, this paper will study from the perspective of big data information. Firstly, it discusses the necessity of improving software testing methods, then analyzes the application requirements of big data information, and finally puts forward the improvement strategies of software testing methods. Adopting the strategy in this paper can give full play to the role of big data information and improve the software testing method. The improved testing method is more effective, which indicates that the improved strategy in this paper is effective.

Keywords: Big data information · Software testing method · Methods to improve

1 Introduction

With the development of the network, information technology and popularization, people live, work and other places full of all kinds of software, people also need a variety of software to an activity, so the software on the quality of life of modern people, work efficiency has a great influence, such as in this case the software itself at least to do not make a mistake, can according to the standard process running smoothly, Therefore, in order to ensure this, every software needs to accept software testing before it is put into market application, and the test results determine whether the software can be put into influence. However, in view of the current situation, the software testing methods mainly adopted in China are relatively traditional, and the test results inevitably have the problem of insufficient accuracy, which is also the main reason why many software often need maintenance after being put into market application, and may cause serious impact. Therefore, in order to change the status quo, software testing methods must be improved. The current hot big data technology is the main way to achieve method improvement. How to give full play to the role of big data information to carry out improvement work is a problem worth thinking, and it is necessary to carry out relevant research.

2 The Necessity of Improving Software Testing Methods

Software as an important tool in modern life and work, often the quality problems or errors, is bound to cause many inconvenience to people, so in order to avoid problems, software design need to be after completion of software testing, software according to the result, whether there is a problem, if there is a problem is to adjust, otherwise can into practical application. This background, the software test result must have higher accuracy, but the defect of traditional software testing method, testing various parameter Settings in the lack of mathematical basis, is dependent on subjective experience, at the same time, the test algorithm efficiency is generally low, and explain the process of traditional methods in the accuracy of the results and efficiency of two aspects flaws, It is impossible to guarantee that software can be used smoothly after it is put into practical application, and problems are still easy to occur in actual situations. From this point of view, traditional software testing methods must be improved, which is also the goal that related fields have been pursuing for years, and this goal can finally be realized under the background of big data. Taking the program P as an example, z is the self-variable vector and T is the input function based on the big data information, when $T = T_1, T_2, \dots, T_n (n > 1)$, the output expected value is $T' = T'_1, T'_2, \dots, T'_n$, o are program specifications s at $T = T_1, T_2, \dots$. When T_n , the actual output value is expressed as $o' = O'_1, O'_2, \dots, o'_n$, if $o' = o'_1, o'_2, \dots, o'_n$, o and $T = T_1, 2, T \dots, T'_n$ is the same, or the difference is not big, then it shows that the software test is correct, this test logic finds the actual relationship between the software test, can output accurate test results [1–3]. Figure 1 shows the

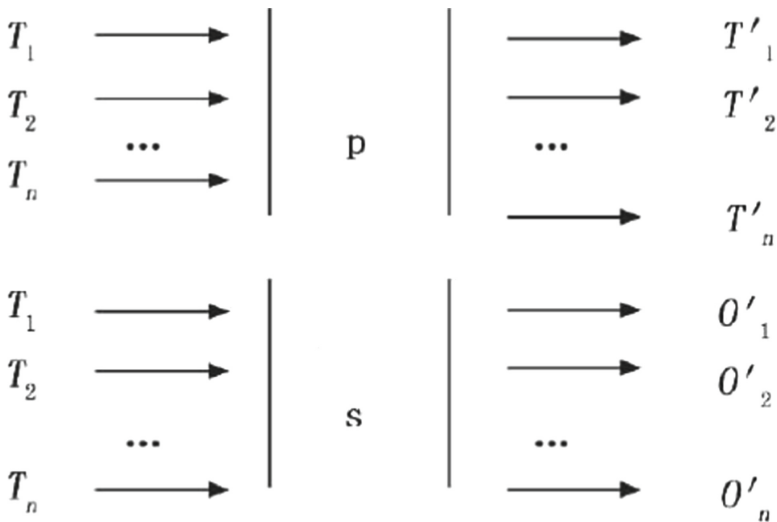


Fig. 1. The relationship between input and output in big data software testing

It is worth noting that the big data information of software testing the basic logic of basic logic and traditional software testing method has no evident difference in form,

but they cannot confuse STH with STH else in the parameter, the traditional software testing methods lack the support of mathematical theory can't set the scope of o, o have no restrictions in the process of calculation, therefore, This kind of software test does not have normative, natural falloff test results, but the big data information based on software process model is based on the reality of the data of feedback, which involves various physical and chemical reaction, namely physical reaction is to point to in the case of no loss of test conditions reduce the amount of test data, Then without changing data on the basis of data collection, sampling and filtering operation method and so on, it can generate data, more clear understanding of the software on the "physical" whether can operation stability, and chemical reaction is to point to in no loss test conditions on the basis of the data extraction, and then to environmental testing of software data logic, Test whether it can operate in different environments, and each environment should be as close as possible to the environment when people use the software, so as to successfully teach and research whether the software has applicability. In the physical and chemical reactions based on big data information, o in the test has a clear range of values, test standardization is improved, and the accuracy of test results can be guaranteed naturally [4–6].

Big data information application requirements.

To transform software testing through big data information, it is necessary to master the basic application requirements of big data information in software testing. Therefore, relevant discussions will be carried out below.

2.1 Application of Big Data Information Mining Technology

Big data information in the main function of software testing is to provide the powerful data support, according to the data to deeply analyze the software running mode, find out the problem, but the big data information itself is just pure data integration of body, does not have the ability to actively play a role, so you need to solve the external means to mining, However, the huge amount of data information inside the big data information and the intricate relationship between the data information make it impossible to be mined by ordinary means, let alone effectively processed by manual, so special mining technology must be used, which is called the big data information mining technology. So-called data mining technology, in the modern theory will be classified as a kind of intelligent technology, this technology has a unique intelligent logic, can according to the known condition of the human input from huge data information extraction all eligible data in the body, after preprocessing will dig deep for extracting data from information, clarify the relationship between the data and information, This technology is the foundation of big data information application because it can be used to know how the software behaves in various data logic to detect problems [7]. Figure 2 shows the application flow of big data information mining technology.

2.2 Application of Big Data Information Storage

The most important feature of big data information is its huge amount of data, which can even reach hundreds of millions of levels, and its growth and update speed is extremely

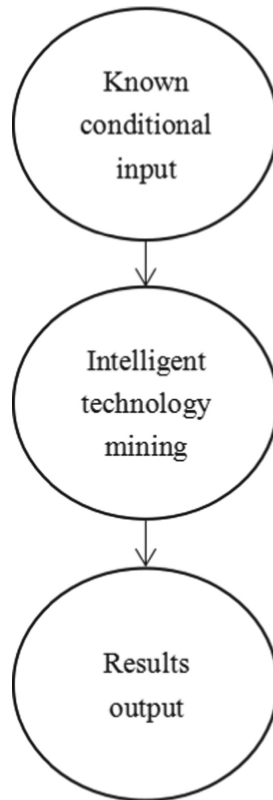


Fig. 2. Application flow of big data information mining technology

fast. Therefore, in order to play its role in improving the traditional software testing methods, it must meet the storage requirements of its huge amount of data. Based on this, common database storage capacity is limited, and the expansion has the certain difficulty, also can bring some cost, even if will meet the demand of storage, the short term will be in the big data information level growth reached its limits, illustrate common database does not meet the demand of large data storage, result in large data information application could satisfy the requirement of storage must be found in the database. According to this requirement, can satisfy the current big data information storage requirements of the database is cloud database, the database is the total storage capacity of the infinite (because of the cloud data is the data stored in the network environment, so the total capacity is infinite), and the expansion operation is very convenient in practical application, also won't bring too much cost, cloud database is a good choice to large data storage, It should be widely used. In addition, the cloud data under the unlimited storage capacity expansion is needed for operation, because the original cloud database data storage environment with openness, which may lead to data were leaked, it must be conducted on the basis of the original environment application in the enclosed storage, to

ensure the security of data, for the current expansion of the reentry after storage capacity limits [8]. Figure 3 shows the basic application flow of cloud database.

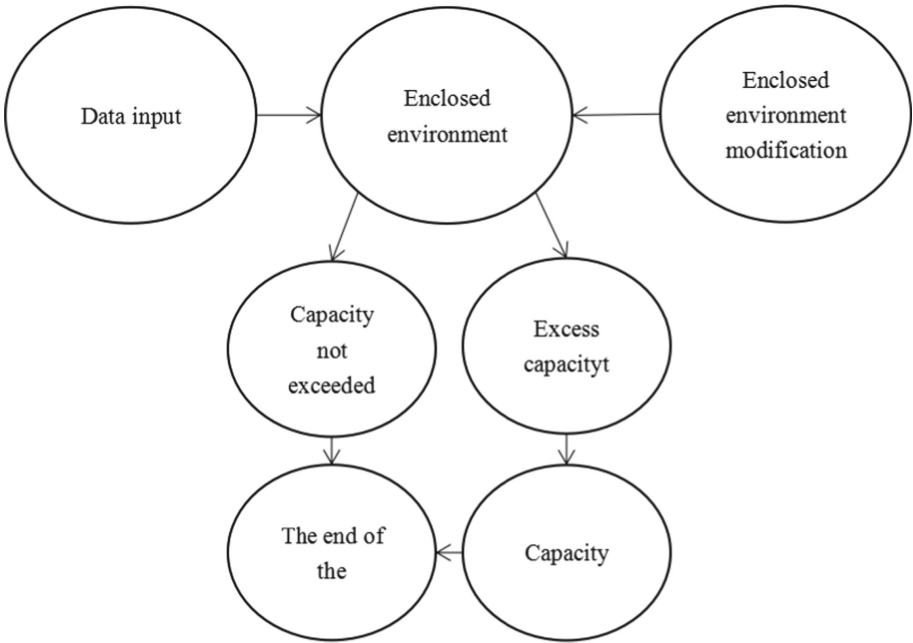


Fig. 3. Basic application flow of cloud database

3 Improvement Strategy of Software Testing Method Under Big Data Information

There are many improvement strategies for software testing methods under big data information, among which there are three representative ones, as follows.

3.1 Improvement of Particle Swarm Optimization and Ant Colony Algorithm

Using big data information to software testing is the purpose of the improvement in order to enhance the test method of intelligent, so that more accurate results, according to this purpose can use particle swarm - ant colony algorithm to improve, the method is mainly to provide mathematical logic to the software testing, data generated can be more accurate test software. The method steps are as follows: First, establish the basic framework of particle swarm optimization (pso), play a particle swarm can be found in the global optimal solution of advantage in preliminary tests, namely particle swarm optimization

(pso) algorithm is a mimic the behavior of birds for food and create the algorithm, each particle in the algorithm is the equivalent of a bird in the flock, every bird know the general direction of food, so know the range of foods, too, Thus formed the global, but every bird doesn't know the location of the food, so it will be through the search for the way to the surrounding area in search of food, food represents the optimal solution, and when a bird confirm food after the general location of all the birds can to the bird and the nearest food, and in the search area, eventually find food, algorithm and get the optimal solution, Therefore, particle swarm optimization algorithm can effectively obtain the test index standard, according to the software data results and the comparison of the standard, the basic situation of the software; Second, ant colony algorithm is a typical probability algorithm, the main role is random optimization, in software testing can be further optimized particle swarm optimization results, in order to get better results. As the name implies, ant colony algorithm is an algorithm designed to imitate the collective behavior of ants. Logically, it is assumed that each ant in the ant colony has its own trajectory, according to which it can roughly infer the direction that the ant may go next (the direction is complex) and the probability that the ant enters each direction next. Which is based on the ant's current location and the target location in the distance, the distance between all sorts of unpredictable factors, and ants are social creatures, so when an ant current direction faster close to food, other ants would have to close here, this process will continue to cycle, until touch the food, with unpredictable factors during the period of change, The direction of the ant's movement will also change randomly, so that the optimal path can be obtained, so that the result is constantly optimized [9, 10].

3.2 Improvement of Modeling Processing

By big data information to test software, test personnel shall realize that big data information under the software testing can commence from multi-azimuth, is no longer a single test process, namely the past testers also tried different azimuth of software testing, but which involves the calculation of the amount is too big, can't get accurate data test results, The relationship between input data and output data cannot be well judged, and the process will be limited by various factors. However, the software testing under big data information has strong data support and can also be mined by technical means, so the multi-directional testing can be realized. Under the concept of multi-directional testing, modeling processing strategy can be adopted to improve the software testing method. See Fig. 4 for the specific operation process.

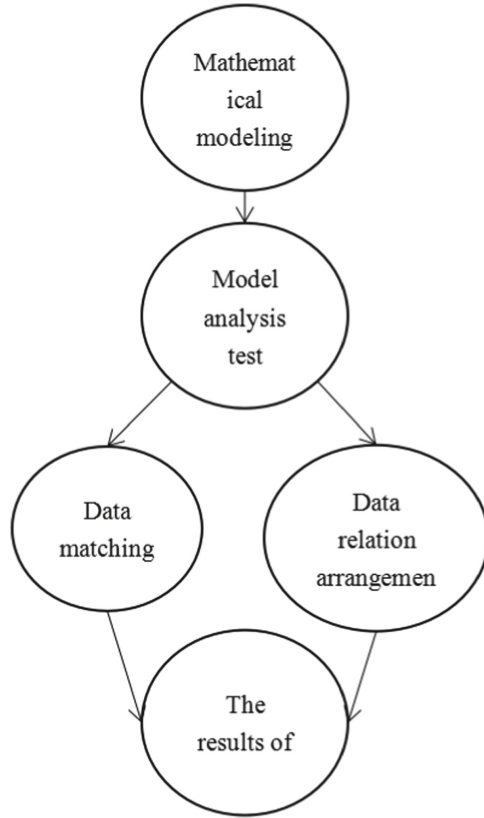


Fig. 4. Models the processing operation flow

According to Fig. 4, the software testing foundation is firstly established through data modeling, then data matching and data relation sorting and calculation are carried out on the model, and finally the results are obtained. According to the results, it can be known whether the actual software testing data matches the standard data of the model. The higher the matching degree, the better the software testing results. At the same time, the software performance level and software error rate can be judged according to the data relationship. The test results are not only of high accuracy, but also involve a wide range of areas.

3.3 Improvement Strategy of Big Data Simulation Test

Simulation software is a kind of general-purpose tools, the main function is based on user needs and the original data to create a virtual simulation environment, highly, the environment can testing various programming model, so long as the process model can basically normal operation in the simulation environment, so it can be put into use, shows that the simulation software is better software testing tools. From this point of view, the original data needed for simulation can be mined in the database by mining technology,

and then the software model can be imported into the database, and the decision can be made according to the results. This method is simple to use, accurate results, and worth popularizing.

4 Conclusion

To sum up, big data technology is obviously helpful to basketball teaching in colleges and universities. Using this technology to establish an online platform can improve the theoretical teaching of basketball, develop students' interests through theoretical teaching, give full play to the role of physical education, and improve students' physical fitness. At the same time, the platform can also improve the teaching efficiency, promote the basketball teaching can be more smoothly.

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