Software Development Processes

Author Name ： Li Guangyi

Zhejiang Normal university

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Abstract:

the traditional software engineering methods focus on software technology and software development process itself, the software item of success or failure depends on the personal quality of a project. The data mining technology is introduced into software engineering can help the lack of experience in the field of engineering personnel to more effectively predict and manage progress, on the premise of not affect software quality shorten the software development cycle, ultimately reduce the cost of software development.

Keywords: data mining; Software engineering; The software development process

Software development process is to point to the user's requirements into the process of software products, are used to develop and maintain software and related products (the project plan, design documents, programming code, test, user manual) of a series of activities, methods and practice, in brief is to use a set of tools, methods and practices to create software. The goal is to improve the quality of software and software engineering productivity and eventually realize the industrialization of the software production [1].

Software development organizations and other groups, in the beginning make a plan, plan specified in the need to implement the specific steps in the process of main goals and achieve their goals. In the process of the implementation of the plan, the continuous improvement of the software product, the implementation of the necessary adjustments to the plan, but all of the plan have three ultimate goal: software products of high quality, low cost and delivery time as early as possible [1], as a result, in does not affect the final software product quality under the premise of try to shorten the software development cycle as the basic goal, the user not only hope so, developers from the perspective of cost reduction hope so, too.

Software developers hope for the software product can be summarized as three aspects: the product of the business cycle is longer, the original products in the case of without modification can use longer, allows to quickly to the latest technology into the software project [1].

In order to achieve the above goals and requirements, there will be a variety of thoughts and ideas into the software development process, such as traditional software development models (waterfall model, evolutionary model, spiral model, etc.) [2], software maturity model (CMM, unified software development process (RUP), and so on. In the concrete implementation of a software project, it introduces a variety of management

methods, and each link in the process of software development a detailed management and control, such as cost management, demand management, risk management, schedule management, quality management, configuration management, fault management, personnel management and so on. The introduction of the ideas and methods, to a great extent, solve the various problems encountered in the process of software development, such as version control problem, the coordination with the user, internal communication problem, configuration, confusion, inefficiencies and so on. But these development thought and software development methods are mostly focus on the technology itself, focusing on the development process of how to improve and optimize the development steps and details, software project success or failure is still largely depends on the quality of software developers, especially the personal quality of the project manager.

2 the introduction of data mining technology

Data mining process, that is, from a large amount of data to extract implicit, previously unknown, has potential application value of information. The process of data mining techniques mainly include the association rule mining, classification and prediction, cluster analysis, etc. By using association rule mining, can find fun from the data set classification and prediction of the model [3] allowed according to the experience of the past data to predict and analysis and properties of new project; Clustering analysis is a grouping of the completed project [4], the new project can be determined and where that boy some old projects more similar.

Due to the introduction of the advanced idea of software development, software development of each link will produce large amounts of data [5], the data for the use of data mining technology in the process of software development has paved the way. Through the data mining technology can find the relationship between the various data, analyze the various factors in the software development process, the quality of product development costs, and the effects of the delivery time. In addition, each completed project leaves a large amount of data, such as the stages of the document, the function module of the input, output, completion time, the corresponding error report, such as investment of manpower and the change of personnel. The data mining technology can be conducted on the data mining, to help the project manager to predict the development of the new project, avoid the previous problems in the current project.

To ensure software quality, the project manager needs to forecast software project analysis in several ways, for example, the need to develop a line of code, need the number of documents submitted to customers, complete all stages of software development process requires specific time, etc. At present although there are several tools that can help the project manager in the software design phase to complete these predictions, but few tools can be used in software design phase and at the same time the software development phase, the project members can only rely on their own experience to complete the forecast work, if the current project is not familiar

with areas, predicted results are more cannot meet the need.

In general, before the start of the project, the software project manager is very difficult to accurately predict the project completion time, it is hard to analyze and solve the problem of beyond his experience and ability. The applications of data mining technology to software development, can help the inexperienced project managers make the right decisions in the software development process.

Even in strict accordance with the standard software development process of the organization progress of the project, some problems are still hard to solve, for example, in the process of project, the user needs to improve or increase the software functions and features, the project team after knowing demand, to adjust the software architecture or refactoring, but so often repeated down, source of demand is not clear, the software specifications can't response demand change, or receive demand but not adjust the overall progress of the project, easy to cause some confusion. If the project has been completed in the requirements analysis phase from the data and its changes in mining to form a training data set, and the requirements analysis phase formation of the data analysis process, time limit for a project can be predicted more accurately and workload; Or to find some useful rules, such as what kind of requirements on what time is most likely to be changed? What types of requirements change after the most serious consequences? Wrong what is the relationship between production and demand change, etc. In the process of software development based on the instance form error report, how to apply data mining technology to the software development process.

3 the instance data mining

Modify the errors in the software is laborious work, if developers find the errors in the software, but not sure how long it will take to correct mistakes, may directly affect the success of a software project. If in the early stages of software development process is to accurately predict the time required to correct mistakes, you can save a lot of money and manpower, and achieve more accurate control for the whole project. In addition, in the software development process, the error in the software is modified, just keep the error report, not for further analysis and use, if use data mining technology to solve the problem

Analysis report, to help developers to find the methods to solve the problem quickly. So the mining of error report can help developers to more effectively implement forecast analysis, properly adjust the development plan and shorten the development cycle of software.

In a large software project, the problems existing in the software should be described very detailed, errors in the software may have the following

Properties:

(source: 1 > error of belonging to a component or report an error

The door.

(2) abstract: the main content of the error.

(3) the person in charge: specify who to deal with this error.

(4) submit: who found this mistake.

(5) credibility: this error is really wrong?

(6) environment: there is an error of the module.

(7) remarks: modify the wrong advice.

(8) submit time: the deadline of the bug report.

(9) closing time: the error report the closing time.

(10) description: describe in detail what is wrong, and for the whole department

The influence of the system.

(11) priority:

High: mistakes should be corrected immediately.

Medium: error correction must be within the prescribed time.

Low: error must be corrected within the software development cycle.

Severity (12) :

High: have an impact on the entire system.

Medium: subprojects.

Low: for the module.

(13) :

Open: error have been submitted but has not been authorized.

Active: error is effective and has defined responsibility.

Errors are analysed: the examination and approval.

Suspended: error does not handle temporarily for some reason.

Closed: closed, regardless of whether the error has been corrected, the work related to the error is over.

Resolved: the error has been successfully modified.

Feedback: error defined responsibility is waiting for the feedback from the third party, according to the feedback, errors can be further subdivided into resovled

Active and suspended state.

(14) categories:

Sw - bug: errors in the code.

Doc - bug: errors in the document.

Change request: a change in the demand of users.

Support: this error is due to the tool, have no direct relationship with the software product.

Duplicate: this error is included in another bug report.

The goal of data mining from the completed tasks in the data to find useful knowledge, all the mistakes must be in a closed state (closed, unsure of error reporting data sets cannot be elected to mining. Determine after data set, you can choose one or more mining strategy to deal with the data, which may find similar knowledge.

(1) the severity of the error report is low, the priority is medium, the confidence level 70. 72 o, support degree of 6.500.

(2) the error correction term at 21 between 108 days a year, the severity of the error report is low and priority is medium, confidence, 8200, 3% support.

Under the rules of the find, project managers can make the following judgment: a new error report submitted, it is high priority and severity is high, 3 days have been the possibility of a correction for 7500, if the time limit for a project is very tight, small personnel adjustment is necessary.

4 conclusion

A lot of research results show that the data mining technology can provide powerful

decision support in the process of software development, supplement the standard software development process from the side of disadvantages. The application of data mining technology in the field of software engineering is still in the exploratory stage, there is no molding ideas and products, at present in most CASE tools is not the concept of data mining, so it is a worth studying further.

[1] [beauty} ROGER s. PRESSMAN, software engineering practitioner road [M], Beijing: Tsinghua teach press, 2001.193 217.

2] Zhang Haifan, software engineering. EY theory [M], Beijing: tsinghua university study press, 2000. 5-12.

[3] [and] JIAWEI HAN, MICHELINE KAMBER. The concept of data mining Technology [M], thorgrim xiao-feng meng, Beijing: mechanical industry press 2003.150-178

[4] AGUILAR J, RAMOS h RIQUELME-SANTOS J C, et al. An evolutionary approach to estimating software development projects [J]，Information and software technology, 2001, 43(14):875-882.

[5] RICHI NAYAK, TIAN QIU.A data mining application; analysis of roblems occurring during a software project development provess[J]，International journal of software engineering and