Software Development Processes

Virgil(Student NO.13211218)

Zhejiang Normal University

Software Project Management

Abstract

Software is something that connects user to hardware. People need software to finish work. Software crisis happened quickly after software was born. People realized that they needed a systematized way to help them manage the software projects. The processes of software development must be more logical. It was summarized that software development process includes analysis, requirements analysis, designing, implementing, testing and maintenance. The logical software development process helps programmers to develop quality software and hand in the software on time. The software development processes will become more and more important because it helps programmers know the structure of a software well.

Introduction

In 1969, Lehman, a software engineer, spent more than a year on studying the programming practices of IBM. He presented a new concept, “Programming Process”. Programming process is a collection of all activities and techniques for transforming an idea into a binary program. It is the basement of software development processes.

Software is a relation between users and hardware. It is a process that an idea changes to a software. Before the concept of software development processes is presented, people take the process as a black box. A software product only bases on the requirements. In this model, the time and resources for developing a software are unpredictable. The requirements are also ambiguous in the initial stages of projects[Zhichang Qi 2012].

For reducing the risk of developing software, people need to learn the software development process clearly. Some researchers presented the Software Life Circle. For examples, Royce presented the Waterfall Model, Boehm presented the Sprial Model.

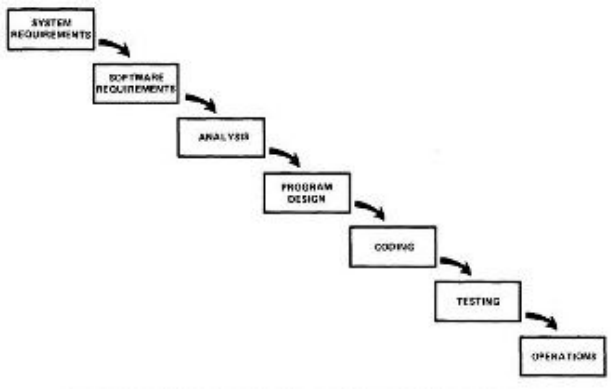

Figure 1: Waterfall Model

Software Life Circle

Software Life Circle defined the different stages of software development. It includes requirements analysis, designing, implement, testing, delivering and maintenance.The Software Life Circle also provides guidance to all stages of software development[Ian Sommerville 2011].

In a word, the Software Life Circle defines the structure and principles of software development processes, but it hasn’t presented the activities, management, tools and rules of software development processes.

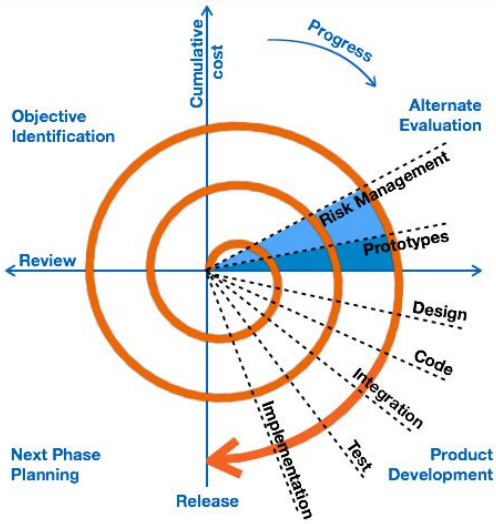

Figure 2: Software Life Circle

Software Development Processes

Software Life Circle soon developed into Software Development Processes. In 1980s, Software Development Processes became an independent discipline.

The significances of software development processes are :

- Estimate the schedule and cost of development
- Use resources efficiently and reducing cost
- Ensure that the software product is stable enough
- Monitor the development of software
- Find out problems earlier and solve them
- Use the experiences to manage the whole project
- Ensure the profit of all stakeholders

After the software development processes concept became, the software development processes standards and models are presented. The most famous three standards and models are CMM/PSP/TSP, ISO9000 and ISO/IEC15504[Min Guan 2013].

A standard software development process can be divided into some stages which are very similar to the Software Life Circle, but the first stage changes to feasibility analysis[Yongtao Ma 2014].

The stages of a standard software development process are

Feasibility Analysis

The developers need to estimate the feasibility of the project and finish a feasibility report. They need to consider the facts both from market and the company itself.

Requirements Analysis

In this stage, designers need to learn the requirements of users. Users and designers need to get a common view of the software.

Designing

This is a stage that designers begin to design how will the software be. They will decide what ideas will be used in the software, decide the structure of the software, decide the modules and interfaces of the software and so on.

Implement

In implement stage, designers will begin to write codes, build modules and put all modules together to construct the software.

Testing

Designers begin to test the software by using test use cases and find bugs in testing stage. They will write testing report and analyze the reasons of those bugs.

Delivering

In this stage, the product will be delivered to the users. It includes delivering and installing.

Maintenance

Designers need to solve problems that users are faced with when they are using the software. Designers need to update the software to solve the problems which they didn't find in testing stage.

Reference

Ian Sommerville 2011, *Software Engineering* China Machine Press

Zhichang Qi 2012, *Software Engineering* Higher Education Press

Min Guan 2013, *Computer Science* Chongqing Tianxu Press

Yongtao Ma 2014, *Software Development Processes* China Machine Press