Software Development Processes

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Abstract

Software development processes refers to the structural framework of the whole process, activities and tasks of the software development. Software development, including requirements, design, encoding and testing phase, and sometimes including the maintenance phase. The software development model can express the whole process of software development clearly and intuitively, and it clearly stipulates the main activities and tasks to be completed, which is used as the basis for the software project.

Keywords: software development, requirements, design, encoding, testing phase, maintenance phase

1 Introduction

Software development processes has several different models, including waterfall model, V model, spiral model, prototyping model and so on. For different software systems can use different development methods, use different programming languages and various skills of personnel to participate in the work, the use of different management methods and means, and allowing the use of different software tools and different software engineering environment.

2 Approaches

Several software development approaches have been used since the origin of information technology, in two main categories. Typically an approach or a combination of approaches is chosen by management or a development team. "Traditional" methodologies such as waterfall that have distinct phases are sometimes known as software development life cycle (SDLC) methodologies, though this term could also be used more generally to refer to any methodology. A "life cycle" approach with distinct phases is in contrast to Agile approaches which define a process of iteration, but where design, construction, and deployment of different pieces can occur simultaneously.

3 Software Process Models

3.1 Waterfall Model

The waterfall model is a sequential development approach, in which development is seen as flowing steadily downwards (like a waterfall) through several phases, typically:

1. Requirements analysis resulting in a software requirements specification
2. Software design
3. Implementation
4. Testing
5. Integration, if there are multiple subsystems
6. Deployment (or Installation)
7. Maintenance

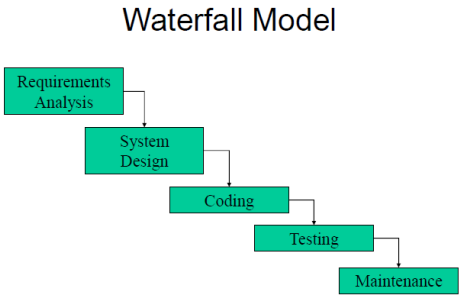

Figure 1: *Waterfall Model*

3.2 V Model

The V-model is a term applied to a range of models, from a conceptual model designed to produce a simplified understanding of the complexity associated with systems development to detailed, rigorous development lifecycle models and project management models. The V-model is a graphical representation of the systems development lifecycle. It summarizes the main steps to be taken in conjunction with the corresponding deliverables within computerized system validation framework.

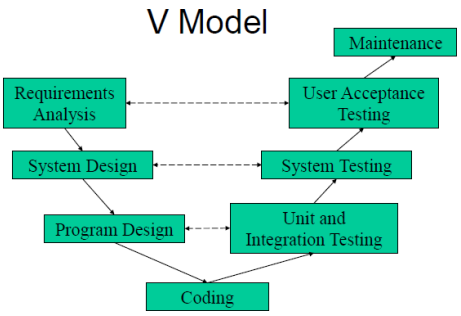

Figure 2: *V model*

3.3 Spiral Model

The spiral model is a risk-driven process model generator for software projects. Based on the unique risk patterns of a given project, the spiral model guides a team to adopt elements of one or more process models, such as incremental, waterfall, or evolutionary prototyping. Four major activities

- Planning
- Risk analysis
- Engineering
- Evaluation

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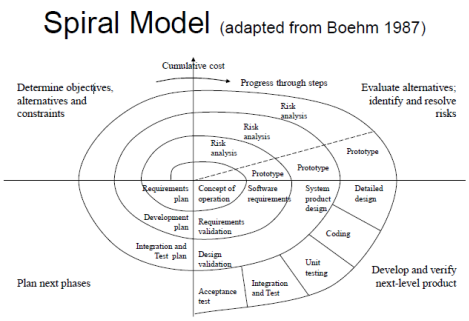

Figure 3: *Spiral Model*

3.4 Prototyping Model

Software prototyping is the development approach of activities during software development, the creation of prototypes, incomplete versions of the software program being developed. Goals

- meet (some) user requirements at an early stage
- reduce risk and uncertainty
- verify a design or implementation approach

Prototyping Sequences

- Requirements gathering
- Quick design
- Prototype construction
- Customer evaluation
- Refinement
- Loop back to quick design for fine tuning
- Product engineering

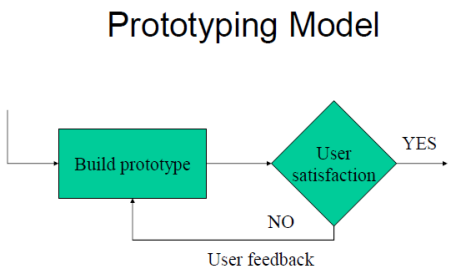

Figure 4: *Prototyping Model*

4 Conclusion

Software development process is made up of those models. It can provide the software engineering management milestone and the progress chart, provides the principle and the method for the software development. A variety of software development process models have been developed, most of which focus on the process of software life cycle from requirement analysis to software verification testing.

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