Software Development Processes

Max
Zhejiang Normal University
Software Projects Management

Abstract

This report covers the basic definitions, different kinds of modeling, techniques and approaches in software development process, with their advantages and disadvantages. Then, it talks about what is project schedule and the Work Breakdown Structure (WBS) which is related to scheduling. Finally, it discusses scheduling techniques such as Simple Sequencing and Critical Path Method (CPM).

Keywords: Software Process, Software Process Model, Project Schedules, WBS, CPM

1 Introduction

Software Process is the set of activities, methods, and practices that are used in the production and evolution of software. In the development process of a software, it means splitting various software development work into distinct phases containing activities with the intent of better planning and management. Therefore, it is also considered a subset of the system development life cycle (SDLC)[for Medicare and of Information Service (2008) 2008]

2 Software Process Model

Software Process Model is one specific embodiment of a software process architecture, which is also named software development approaches. The development team will choose one or more approaches before the software process start. There has two main categories, one is "traditional" modeling such as waterfall model, prototyping. The other defines the process of iteration like Agile model.

Waterfall model The waterfall model is a sequential design process used in software development process. As can be seen from Figure 1, there is a sequence of activities to do from top to bottom. The good point of waterfall model is that it creates natural milestones at the end of each phase.[Hughes and Cotterell 1999] However, it is not an appropriate approach when meets uncertain and flexible needs.

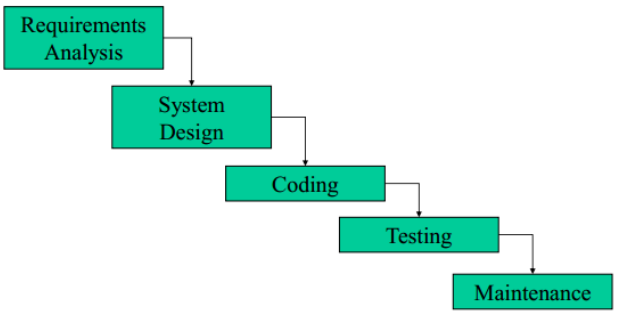

Figure 1: *Waterfall Model - progress flows from the top to the bottom.*

Sprial model Some software development need a greater level of detail consideration at each stage of the whole project in order to lead to the success of the project. So this can be portrayed as a spiral where each activity can be implemented in more detail. So this is a risk-driven process model. [Wikipedia b]

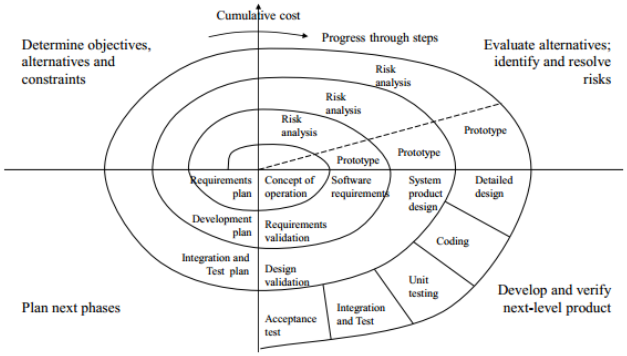

Figure 2: *Sprial Model - spend more on each stage to reducec uncertainty*

Prototyping A prototype is a working model of one or more aspects of the system. It is a way that meet some user requirements at an early stage and aims at reducing risk and uncertainty of a software project. Prototypes can be classified as:

- Throw-away, after users agree the requirements of the system, the prototype will be discarded.
- Evolutionary, modifications are based on the existing prototype.
- Incremental, functions will be arranged and built accordingly.

3 Project Schedule

The project schedule is a plan that must be developed to the level of showing dates when each activity should start and finish. Before a project schedule can be created, a hierarchical description of all the tasks should to be performed, which is called work breakdown structure (WBS).

4 Scheduling Techniques

There are two types of scheduling techniques.

Simple Sequencing This is a simple sequencing of the tasks and the responsible personal taken into account of the resources. It is easily presented in a simple bar chart and suitable for allocating individuals to particular tasks at an early stage.

Critical Path Method The critical path method (CPM) is a project modeling technique developed to plan the project so that

it can be completed as quickly as possible. Besides, it can be used to identify those activities where their delays is likely to affect the overall project completion date. [Wikipedia a]

5 Conclusion

Software development approach can differ from system to sytem. Choosing a proper development approach is critical and can make a huge difference on the success of software development.

References

FOR MEDICARE, C., AND OF INFORMATION SERVICE (2008), M. S. O. 2008. Selecting a development approach. 1

HUGHES, B., AND COTTERELL, M. 1999. *Software Project Management(Second Edition)*. McGraw-Hill Publishing Company. 1

WIKIPEDIA. Critical path method. `https://en.wikipedia.org/wiki/Critical_path_method`. Accessed: 2016-03-06. 2

WIKIPEDIA. Spiral model. `https://en.wikipedia.org/wiki/Spiral_model`. Accessed: 2016-03-06. 1