Software Development Processes

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Abstract

This short report introduce a Software Development Processes.It also include software project plan estimation,software development models and software project plan schedule.The report has been formatted ,so whether or not you have professional knowledge,you can understand it well.This report has something for you,maybe it will help you to know this subject more comprehensive.obviously,we know that software project management has too much knowledge and involves a lot of practice.it gives a taste of the subject and a some views of core components.It’s not that we necessarily excluded anything from this report.For the sake of practicality, we discuss a variety of important aspects of Software Development Processes, such as, estimation,models and Schedule.

Key words: Software Development Processes,estimation,models,Schedule

1 introduction

In software engineering, a software development methodology (also known as a system development methodology, software development life cycle, software development process, software process) is a splitting of software development work into distinct phases (or stages) containing activities with the intent of better planning and management. It is often considered a subset of the systems development life cycle. The methodology may include the pre-definition of specific deliverables and artifacts that are created and completed by a project team to develop or maintain an application[CMS 2008].We address the following concepts in this report:

✔ What is Estimation?

✔ What is the relation between the Estimation and Risk?

✔ How do a project planing process be provides?

✔ Why do we need a software process model?

✔ When we develop a project,what should we consider about?

✔ List and description of four typical software development model.

Software Project Planning If we want to make a software project be successful.A good planning is very important.The job pattern of an IT company engaged in software project planning can be seen split in five activities:

- Estimation (of work, resources, time)
- Scheduling
- Risk Analysis

- Quality Management Planning
- Change Management Planning

Define:Software project planning is task, which is performed before the production of software actually starts. It is there for the software production but involves no concrete activity that has any direction connection with software production; rather it is a set of multiple processes, which facilitates software production.

Project Estimating activities Estimation is to determine how much money,efforts,resources and time will be cost.It is foundation for all project planning activities.Project Estimating may include:

- Estimating steps
- Estimating and risk
- Estimating expectations
- Accurate estimates
- Estimation Techniques
- Software project estimation

Software process models Software Process is the set of activities, methods, and practices that are used in the production and evolution of software.Software Process Model is one specific embodiment of a software process architecture.Here are a few typical model:

- Waterfall Model
- V Model
- Spiral Model
- Prototyping Model

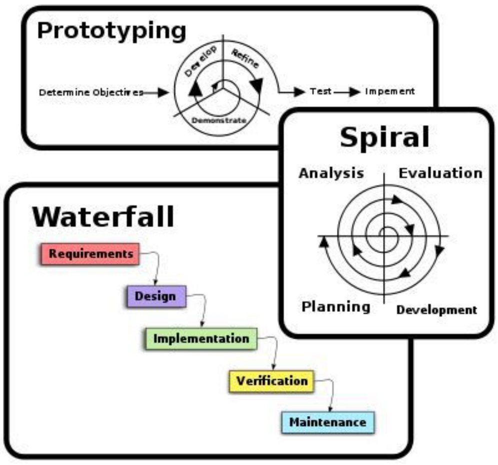

Figure 1: The three basic approaches applied to software development methodology frameworks.

Project Schedule The project schedule is a calendar that links the tasks to be done with the resources that will do them.Before a project schedule can be created,the project manager must have a work breakdown structure (WBS) and estimates.Two important techniques:

- Simple Sequencing (Suitable for small projects)
- Critical Path Method (CPM)Suitable for large software projects

2 Estimation Steps&Risk

For an effective management accurate estimation of various measures is a must. With correct estimation managers can manage and control the project more efficiently and effectively [Villafiorita 2014].

Estimation Steps may involve the following:

- Description of product scope
- Decomposition of problem into set of smaller problems
- Each sub problem is estimated using historical data, software metrics and experience (from past projects) as guides.
- Problem complexity and risks are considered before final estimate is made

There are three connection between estimation and risk:

- Estimation carries inherent risk & risk leads to uncertainty
- Estimation risk is measured by the degree of uncertainty in the quantitative estimates established for resources, cost, and schedule.
- Availability of comprehensive historical information and software metrics (from past projects) • helps establish better estimates and hence reduces risk factors

3 Accurate Estimates

Team members make assumptions about the work to be done in order to deal with incomplete information:

- Any time an estimate must be based on a decision that has not yet been made, team members can assume the answer for the sake of the estimate
- Assumptions must be written down so that if they prove to be incorrect and cause the estimate to be inaccurate, everyone understands what happened
- Assumptions bring the team together very early on in the project so they can make progress on important decisions that will affect development

4 Estimation Techniques

Wideband Delphi is a process that a team can use to generate an estimate:

- The project manager chooses an estimation team, and gains consensus among that team on the results
- Wideband Delphi is a repeatable estimation process because it consists of a straightforward set of steps that can be performed the same way each time

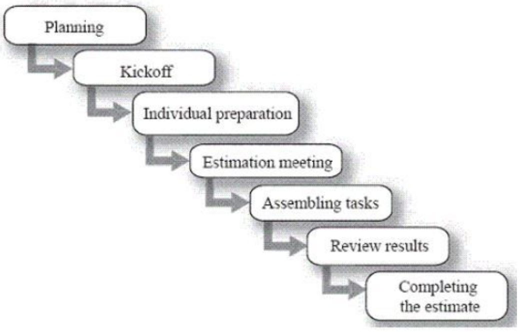

Figure 2: Process of The Wideband Delphi

5 software process model

The benefits of application software development model:

- To provide a common understanding
- To locate any inconsistencies, redundancies and omissions
- To reflect the development goals and provide early evaluation
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Waterfall Model

The first formal description of the method is often cited as an article published by Winston W. Royce in 1970 although Royce did not use the term "waterfall" in this article. The basic principles are:[CMS 2008]

- Project is divided into sequential phases, with some overlap and splashback acceptable between phases.
- Emphasis is on planning, time schedules, target dates, budgets and implementation of an entire system at one time.
- Tight control is maintained over the life of the project via extensive written documentation, formal reviews, and approval/signoff by the user and information technology management occurring at the end of most phases before beginning the next phase. Written documentation is an explicit deliverable of each phase.
- Iterate:- Create a prototype, then the real system. Repeat each phase using new information gained and the entire process at least once before delivering the live system.

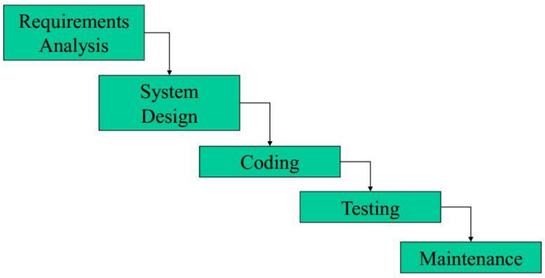

Figure 3: The activities of the software development process represented in the waterfall model.

V model The V-Model demonstrates the relationships between each phase of the development life cycle and its associated phase of testing .[Kevin Forsberg and Harold Mooz 1991]

- Additional validation process introduced
- Relate testing to analysis and design
- Loop back in case of discrepancy

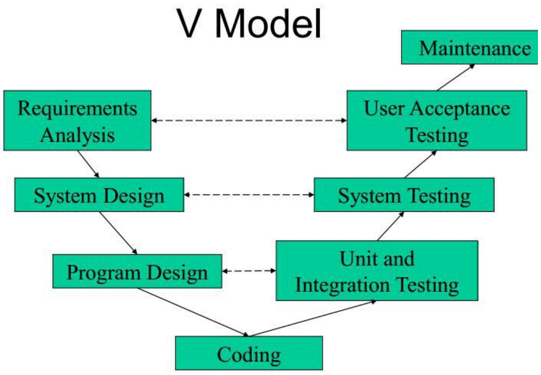

Figure 4: The V-model of the Systems Engineering Process.

Spiral model In 1988, Barry Boehm published a formal software system development "spiral model," which combines some key aspect of the waterfall model and rapid prototyping methodologies, in an effort to combine advantages of top-down and bottom-up concepts. It provided emphasis in a key area many felt had been neglected by other methodologies: deliberate iterative risk analysis, particularly suited to large-scale complex systems.[Kevin Forsberg and Harold Mooz 1991]

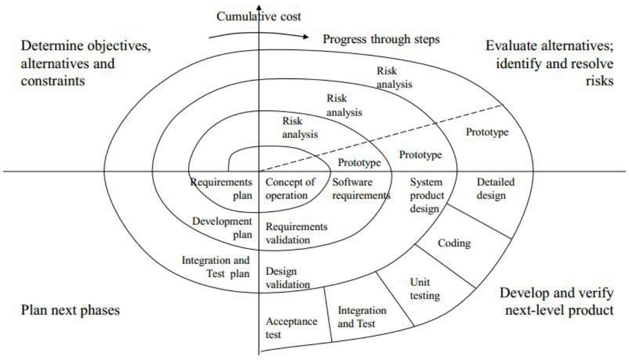

Figure 5: Spiral model

Prototyping model

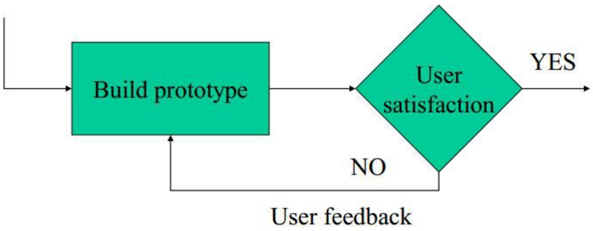

Figure 6:prototyping model

Benefits:

- Demonstration of the consistency and completeness of a specification
- Reduced need for documentation
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- Feature constraint
- Production of expected results for testing real system

Incremental Model First break system into small components,and implement and deliver small components in sequence,in the end Implement and deliver small components in sequence

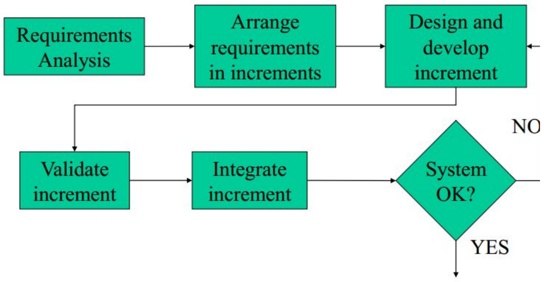

Figure 7: Incremental model

Iterative Model Deliver full system in the beginning, and Enhance functionality in new releases

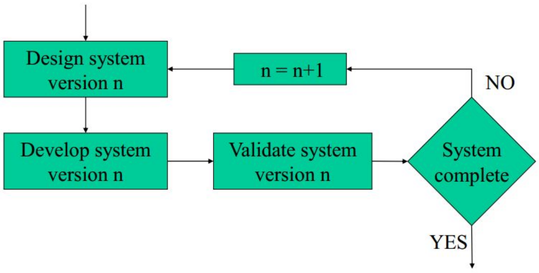

Figure 8: Iterative Model

6 Software Project Planning

Plan is in many states.Planning is an on-going process of refinement.Planning at different stages of the project has different emphases and purposes.

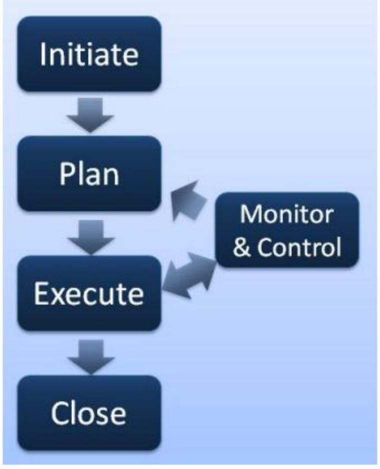

Figure 9: we control the project by updata plan.

Critical Path Method

• Primary objectives:

-Planning the project so that it can be completed as quickly as possible

-Identifying those activities where their delays is likely to affect the overall project completion date

• Capture the activities and their interrelationships using a graph

-Lines are used to represent the activities

-Nodes are used to represent the start and stop of activities

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