Software Development Process

Author Name (骆文杰)*
Zhejiang Normal University
Software Project Management

Abstract

It mainly tells us how the software develpoment process is and the article mainly tells us.The software development methodology (also known as SDM) framework didn't emerge until the 1960s. According to Elliott (2004) the systems development life cycle (SDLC) can be considered to be the oldest formalized methodology framework for building information systems.

Keywords: software engineering, project management, planning, risk assessment,software development process

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.[1] Common methodologies include waterfall, prototyping, iterative and incremental development, spiral development, rapid application development, extreme programming and various types of agile methodology. Some people consider a life-cycle "model" a more general term for a category of methodologies and a software development "process" a more specific term to refer to a specific process chosen by a specific organization. For example, there are many specific software development processes that fit the spiral lifecycle model. ....

2 In practice

A variety of such frameworks have evolved over the years, each with its own recognized strengths and weaknesses. One software development methodology framework is not necessarily suitable for use by all projects. Each of the available methodology frameworks are best suited to specific kinds of projects, based on various technical, organizational, project and team considerations.[1] Software development organizations implement process methodologies to ease the process of development. Sometimes, contractors may require methodologies employed, an example is the U.S. defense industry, which requires a rating based on process models to obtain contracts. The international standard for describing the method of selecting, implementing and monitoring the life cycle for software is ISO/IEC 12207. A decades-long goal has been to find repeatable, predictable processes that improve productivity and quality. Some try to systematize or formalize the seemingly unruly task of designing software. Others apply project management techniques to designing software. Without effective project management, software projects can easily be delivered late or over budget. With large numbers

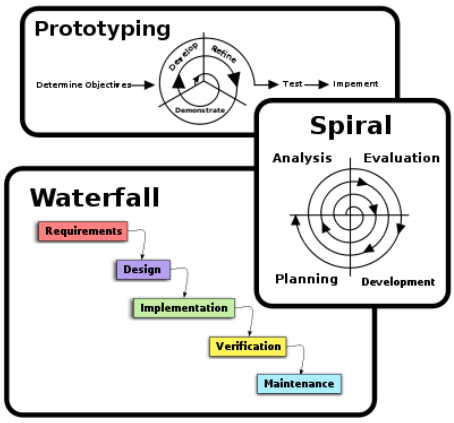

Figure 1: *The three basic approaches applied to software development methodology frameworks.*

of software projects not meeting their expectations in terms of functionality, cost, or delivery schedule,[citation needed] it is effective project management that appears to be lacking. Organizations may create a Software Engineering Process Group (SEPG), which is the focal point for process improvement. Composed of line practitioners who have varied skills, the group is at the center of the collaborative effort of everyone in the organization who is involved with software engineering process improvement. A particular development team may also agree to programming environment details, such as which integrated development environment is used, and one or more dominant programming paradigms, programming style rules, or choice of specific software libraries or software frameworks. These details are generally not dictated by the choice of model or general methodology.

3 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

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

- Technical Analysis
- Software design
- Implementation
- Testing
- Integration, if there are multiple subsystems
- Deployment (or Installation)
- Maintenance

*e-mail:530329021@qq.com

Software Project Management (2016/17)
Author Name: Author Name (骆文杰)
University: Zhejiang Normal University
Title: Software Development Process
Supervisor: Dr. Kenwright

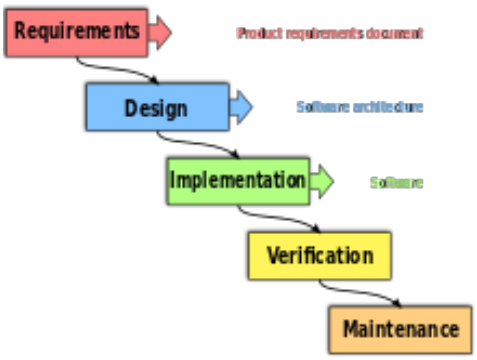

Figure 2: *The activities of the software development process represented in the waterfall model. There are several other models to represent this process.*

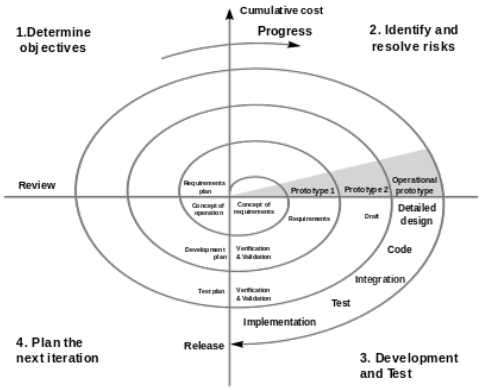

Figure 3: *Spiral model (Boehm, 1988)*

Spiral development: 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. The basic principles are:[1]

- Focus is on risk assessment and on minimizing project risk by breaking a project into smaller segments and providing more ease-of-change during the development process, as well as providing the opportunity to evaluate risks and weigh consideration of project continuation throughout the life cycle.
- "Each cycle involves a progression through the same sequence of steps, for each part of the product and for each of its levels of elaboration, from an overall concept-of-operation document down to the coding of each individual program."[2]
- Each trip around the spiral traverses four basic quadrants: (1) determine objectives, alternatives, and constraints of the iteration; (2) evaluate alternatives; Identify and resolve risks; (3) develop and verify deliverables from the iteration; and (4) plan the next iteration.[3]
- Begin each cycle with an identification of stakeholders and their "win conditions", and end each cycle with review and commitment.[4]

4 Conclusion

From the report, we should konw how the process is and how we can do to make it. we should know the process and try to use it in our cases.

References

1. Centers for Medicare Medicaid Services (CMS) Office of Information Service(2008) .Selecting a development approach. Webarticle. United States Department of Health and Human Services (HHS). Re-validated: March 27, 2008. Retrieved 27 Oct 2008.
2. Barry Boehm (1996., "A Spiral Model of Software Development and Enhancement". In: ACM SIGSOFT Software Engineering Notes (ACM) 11(4):14-24, August 1986
3. Richard H. Thayer, Barry W. Boehm (1986). Tutorial: software engineering project management. Computer Society Press of the IEEE. p.130
4. Barry W. Boehm (2000). Software cost estimation with Cocomo II: Volume 1.