Software development process

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1 definition

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.

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 life-cycle model.

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.

1   Waterfall development
2   Prototyping
3   Incremental development
4   Iterative and incremental development
5   Spiral development
6   Rapid application development
7   Agile development
8   Lightweight methodologies
9   Other
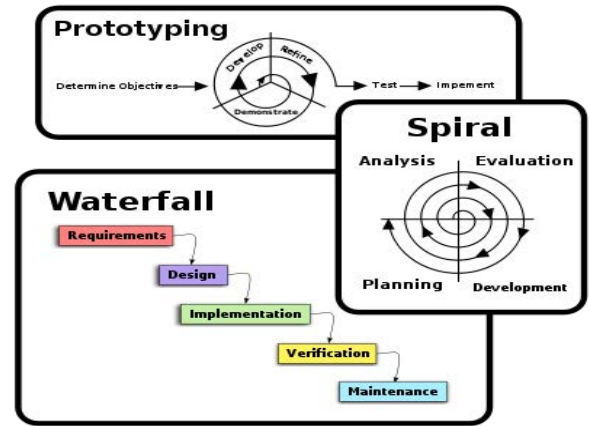
2.1 Waterfall development

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:

· 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.

2.2 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:

· 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."

· Each trip around the spiral traverses four basic quadrants: determine objectives, alternatives, and constraints of the iteration; evaluate alternatives; Identify and resolve risks; develop and verify deliverables from the iteration; and plan the next iteration.

· Begin each cycle with an identification of stakeholders and their "win conditions", and end each cycle with review and commitment.

3 References

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