Traditional Software Development Processes

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Abstract

The software development process is often considered a subset of the systems development life cycle. The development of software process model reflects people's understanding of software process. And it also shows the great improvement of software development process. The successful team always use software process model to design and build the software. It ensure that everyone in the team agrees up front on how they will build software and the software will be built in a way that works for the team and the organization.

Keywords: software development process, waterfall model, prototyping, incremental model, rational unified 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 [for Medicare Medicaid Services (CMS) Office of Information Service (2008)].

2 History

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. The main idea of the SDLC has been "to pursue the development of information systems in a very deliberate, structured and methodical way, requiring each stage of the life cyclefrom inception of the idea to delivery of the final systemto be carried out rigidly and sequentially"[Fischer 2001] within the context of the framework being applied. The main target of this methodology framework in the 1960s was "to develop large scale functional business systems in an age of large scale business conglomerates. Information systems activities revolved around heavy data processing and number crunching routines".[Fischer 2001]

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3 Process Model

3.1 Waterfall Model

The waterfall model is a sequential software development model in which development is seen as flowing steadily downwards (like a waterfall) through phases of analysis, design, coding, testing and maintenance. It is the 'classical' model of system development and we can see an example in Figure 1.

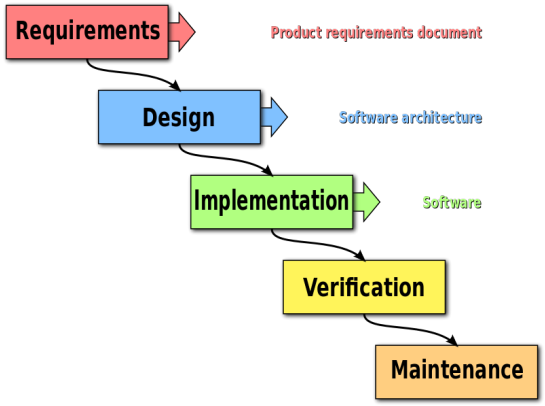

Figure 1: *The unmodified "waterfall model". Progress flows from the top to the bottom, like a cascading waterfall.*

The first description of this approach is said to be that of H.D.Bennington in 'Production of Large Computer Programs' in 1956. This was reprinted in 1983 in Annals of the History of Computing 5(4).[Bob Hughes].

The waterfall model maintains that one should move to a phase only when its preceding phase is completed and perfected. Phases of development in the waterfall model are thus discrete, and there is no jumping back and forth or overlap between them.

3.2 Prototyping

Software prototyping is the activity of creating prototypes of software applications. It is an activity that can occur in software development and is comparable to prototyping as known from other fields. A prototype is a working model of one or more aspects of the projected system. It is constructed and tested quickly and inexpensively in order to test out assumptions.(see Figure 2)

The original purpose of a prototype is to allow users of the software to evaluate developers' proposals for the design of the eventual product by always answering the specific questions and identifying the goals.

Prototyping can improve the quality of requirements and specifications provided to developers. Companies cost less and save time by well using the prototyping. It improved and increased user involvement. However, users sometimes misunderstand the role of the prototype and the project lack of control.

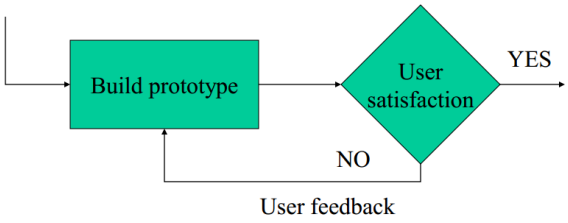

Figure 2: *Prototyping Model*

3.3 Incremental Model

Various methods are acceptable for combining linear and iterative systems development methodologies, with the primary objective of each being to reduce inherent project risk by breaking a project into smaller segments and providing more ease-of-change during the development process.(see Figure 3)

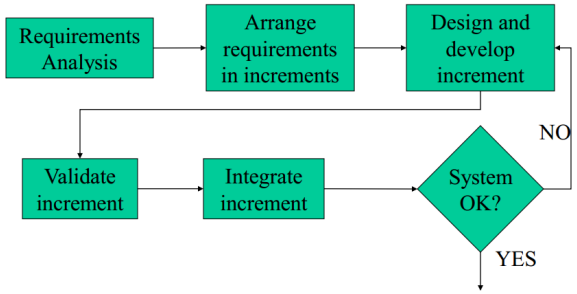

Figure 3: *Incremental Model*

The incremental model always combined with iterative model, so every new release includes extra functionality and the enhancement of existing functionality.

3.4 Rational Unified Process (RUP)

The Rational Unified Process (RUP) is a software engineering process that provides a disciplined approach to assigning and managing tasks and responsibilities within a development organization. The Rational Unified Process uses the Unified Modeling Language visual notation and provides you with guidelines on how to use the UML effectively.[RUP](see Figure 4)

It is an iterative software development process framework created by the Rational Software Corporation, a division of IBM since 2003.[IBM]

4 Conclusion

Over the years, the software developers solve a lot of serious problems by using the software development process in the practice of designing a software. With the rapid development of other fields in software engineering and the continuous accumulation of experience, the software process model is also improved.

It is important to use software development model well when designing a software. However, there is no model could be claimed to be perfect. There is still a long way to go for people learning the concept and usability of software development process model.

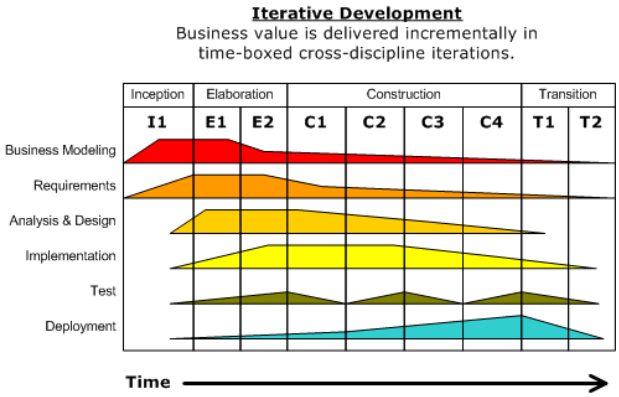

Figure 4: *RUP phases and disciplines*

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