SPM
SOFTWARE PROJECT MANAGEMENT
—

By SHWETA TIWARI

SOFTWARE PROJECT MANAGEMENT

What is a software process?

Both hardware and software are required to run a system. This world of technology cannot operate without software. Just like intelligence is needed to run a body, in the same way we need software systems to operate all industries, financial systems, scientific labs, infrastructures and utilities, games, films, television, all such things properly. is needed.

Now the question arises, what is the process of making these software, that is, how can they be made.

What is this software process? Whereas a process is needed to make all things, in the same way there is a process to make software which we call Software Process. You may have a little knowledge about Softwares, but do you know what this software process is? If not then you,

today we will learn about software as well as software process, its models and characteristics.

Then without delay let's start.

A software process (also called software methodology) is a set of related activities that ultimately help in the production of a software. In these activities, either the software is developed from scratch or a simple system is modified.

What is Software?

A software is a type of computer program that contains associated documents as well as configuration data that helps the programs to operate properly.

A program is also a set of instructions (written in human-readable code) and it performs only one specific task.

There are mainly four activities in any software process.

There are mainly four activities in any software process. Let us know about the four activities of Software Process.

1. **Software Specification:** It defines the main functionalities of the software and the constraints around them. In this, the customer and engineers collect and analyze the features, workflow, operational constraints or limitations of any final software product. This part is very common in all software process, whether it is big or small or no matter how complex.

What is Application Software?

What is MS Word and how to learn

What is a Desktop Computer and when did it come?

2. **Software Design and Implementation:** Software is designed and programmed.

 After doing all the specifications, the goal of the software product is now fixed, the engineers now have to develop the software in which they have to implement all the artworks, audio and visual elements required along with the coding in that software product. .

3. **Software Verification and Validation:** Software should work according to its specification and it should also fulfill the needs of the customers.

The software product has to be checked first for bugs, incomplete for unavailable features etc. At the same time, software validation can be done in small software after software development,

and can also be done multiple times (milestones) if needed, during the software development phase.

4. **Software Evolution (or software maintenance):** In this, the software is modified keeping in view the customer demand and market requirements changes.

A software product can take up to several years to develop completely. Meanwhile, the specifications, feature requirements etc. can be changed as per the requirement. Some of those features can be added, removed or changed. This is the process where software is developed and made even better.

What is Software Process Models

A software process model is an abstract representation of the software process. In this, many general process models are introduced and they are presented from an architectural point of view. These models are used to explain different approaches. These are also considered process frameworks which are extended and adapted to create more specific software engineering processes.

Types of Software Process Models

Let us know about the different process models of Software Process.

1. ***<u>The Waterfall Model</u>***

In this model of software process, software processes the fundamental process activities of specification, development, validation and evolution and they are represented on the basis of sequential process phases such as requirements specification, software design, implementation, testing etc.

2. ***Evolutionary Development***

In this approach, it interleaves the rest of the activities of specification, development and validation. An initial system develops very rapidly from abstract specifications. After that the initial system is further refined to produce such system from customer inputs which will satisfy the needs of the customer.

3. ***Component-Based Software Engineering***

The process models that follow this approach are based on the existence of a significant number of reusable components. In this, the system development process focuses more on integrating these components into a system and not in developing them.

The three generic process models mentioned above are widely used in current software engineering practice. These are not mutually exclusive and they are mostly used together, especially for large systems development. Sub-systems are developed within a larger system using different approaches. So even though it is convenient to discuss them separately, but, in practice they are often combined.

What are the Characteristics of Software Process

Characteristics of software processes

CharacteristicDescription

Understandability: To the extent that the process can be defined explicitly and easily so that the process definition can be understood.

Visibility: In this process activities are fully culminated in clear results so that the progress of the process can be visible externally.

Supportability: To the extent that the CASE tools are supported by the process activities.

Acceptability: To the extent that the process is acceptable and usable, the engineers are also responsible for producing the software product.

Reliability: is called the manner in which the process is designed in such a way that errors in the process are avoided or trapped so that they do not appear in the final products.

Robustness Process: It is prepared in such a way that the process can continue even if there are no unexpected problems.

Maintainability Process: It has been designed in such a way that it can evolve itself and reflect the changing organizational requirements as well as identify process improvements.

Rapidity: It is called the speed by which complete software can be delivered with given specifications.

<u>What are the components of software process</u>

The main objective of a software process is to develop a product that fulfills all the requirements of the user. The major components of a software process are a process management process and a product engineering process.

The main aim of **Process Management Process (PMP)** is to improve software processes, so that a cost-effective and high-quality product can be developed. For this, the existing processes of Completed Projects are examined.

The following tasks are done in the ***Process Management Process such as***

Comprehending the existing process, analyzing their properties, determining how they can be improved, and subsequently affecting improvement. All these processes are done in PMP. A group also called ***Software Engineering Process Group (SEPG)*** performs all activities of process management.

Whereas, according to the above-mentioned analysis, the product engineering processes are improved, so that the software process is improved.

The aim of the product engineering process is how to develop the product according to the user requirements.

There are mainly three major components in this product engineering process, which are listed below.

1. ### <u>Development Process</u>

This is a process that is used during the development of the software. They specify the development and quality assurance activities to be performed. Programmers, designers, testing personnel, etc. perform these processes.

2. *Project Management Process*

 It is concerned with the set of activities that are used to accomplish a set of goals. It provides means so that the allocated resources can be planned, organized and controlled and so that the project cost, time and performance objectives can be met. To do this, many processes, techniques and tools are used to achieve the objectives of projectcs. Project Management team performs all the activities for this process.

3. *Configuration Control Process*

 It manages the changes that occur as a result of modifying the requirements. At the same time, they also maintain the integrity of the products when changes are made in the requirements. Here the activities of Configuration Control Processes are performed by a group also called Configuration Control Board (CCB).

 Note Both Project Management Process and Configuration Control Process depend on the development process. Where the goal of the management process is to control the development process, in which it depends on the activities of the development process.

What is Process Framework

Process framework determines which processes are essential to complete a complex software project. This framework identifies some activities, which are also called framework activities, it is applicable to all software projects irrespective of their type and complexity.

What are the activities of Process Framework

If seen, there are many activities of the process framework, but we will know about some activities here.

1. Communication: In this communication is done properly with the users so that they can understand the requirements properly.

2. Planning: In this, a plan is established to accomplish that project. In which the schedule of the project is described, technical tasks used, expected risks, and resources needed etc.

3. Modeling: In this, attention is also paid to the creation of models, so that the developer and user are allowed to understand what the software requirements are and all the designs so that those requirements can be fulfilled.

4. Construction: In this, the generation of code is combined with testing so that it can uncover all the errors in the code.

 5. Deployment: It implies that the final product (software) should be properly delivered to the user. Then the user evaluates that delivered product and provides feedback on the basis of that evaluation.