

(SPM) PERIOD 3,4  
MS. SHWETA TIWARI  
February 04, 2022 And February 07, 2022

# SPM

# SOFTWARE PROJECT MANAGEMENT

---

By SHWETA TIWARI

## SOFTWARE PROJECT MANAGEMENT

### *What is a software process?*

As we all know, both hardware and software are required to run any system. Software is useless without hardware and hardware is useless without software.

No hardware can operate without software. Just like our brain is needed to run our body. In the same way, software is required to run every hardware system.

But the question is, how do we make these software so that it works in perfect sync with the hardware. It is very important and important that the software created by us should work properly with the hardware for which we have developed that software.

So the question is, what is the process of making these software? The way there is a process to make everything or every product. In the same way, there is also a process to create a software. Which we call software process.

### **Software Process**

A software process is one that consists of a set of related activities. Which goes towards software production, it is also known as software methodology. These activities may include developing any software or modifying an existing system.

To develop or update any software, one has to follow the four activities mentioned below. Which is something like this:

#### **Software specification or engineering requirements:**

In this step all the main functionalities and constraints of the software are defined.

***Software design and implementation:*** In this process the software is designed and programmed.

**Software verification and validation:** In this step the software is completed on the basis of specification according to the needs of the customer.

**Software evolution or software maintenance:** In this step the software is modified and maintained on the basis of customer and market requirements.

Apart from this, sub-activities such as requirements validation, architectural design, unit testing etc. are included in this practice.

Apart from this, supporting activities like configuration, change management, quality assurance, project management, user experience are also included.

Whenever we talk about the software process, in reality we are talking about nothing else but the activities that take place in it.

**However, process description is also included in this process, which is as follows –**

**Products:** In this, what will be the results of any activity, it is told. As such the result of an architectural design will probably be a model for a software architecture.

**Roles:** In this it is told that what are the responsibilities of the people involved in this process. Such as project manager, programmer etc.

***Pre and post conditions:*** In this, those activities are told, which should be correct before and after any activity. As the precondition of the architectural design, approved by the customer is his requirements. Whereas there are reviews describing the condition of the post architectural diagrams.

## **Software Methodology**

Methodology is one such framework in software engineering. Using which the structure of the process of the information system is made, so that it can be planned and controlled.

If you understand it in other words, then it is actually an approach. In which a particular work is completed on the basis of group of rules, methods, tests activities and process.

Many types of methodology are used in doing this work. for example -

### **Agile Software Development**

#### **Crystal Methods**

#### **Dynamic Systems Development Model (DSDM)**

**Extreme Programming (XP)**

**Feature Driven Development (FDD)**

**Joint Application Development (JAD)**

**Lean Development (LD)**

**Rapid Application Development (RAD)**

**Rational Unified Process (RUP)**

**Scrum**

**Spiral**

**Systems Development Life Cycle (SDLC)**

**Waterfall**

**Software Process Models**

A software process model is nothing but a simplified representation of the software process. In which each model represents a single process as a specific perspective.

This is going to be kept as a point of view about general process models. These generic models are nothing but the essence of that process.

Which can be used to explain different approaches to software development. Apart from this, it can be used to create and extend even more specific processes.

Sometimes some methodologies are known as software development life cycle (SDLC) methodologies. But this word can be used as a general reference for almost every methodology.

### **Waterfall Model**

If we talk about the waterfall model, then it is actually a sequential approach. In which every fundamental activity of each process is represented in a separate phase. Which is arranged in a linear order.

That is why it is very important that before you start your work on the waterfall model. Before that, in the waterfall model, it is very important to plan all the activities and schedules.

**Plan-driven process** is a process where first all activities are planned, and then progress is measured against the plan. Whereas in **agile process** on the other hand, planning is incremental and it is easy to change the process to reflect requirement changes.

The phases of the Waterfall Model are in the following order: Requirements, Design, Implementation, Testing, and Maintenance.

### **Incremental Development**

Let us now know, about the incremental development, basically it is based on the idea of developing an initial implementation. Which is exposed through user feedback, then after that, it evolves to many versions till an acceptable system is developed and develops into many versions.

In this, the activities of a process cannot be separated from each other. But those activities are interleaved with the feedback involved.

In this, each system increment reflects a part of the required functionality according to the need of the customer. Typically, the system's initial increments should have included the most important or most urgently required functionality.

This means that the customer can evaluate the system at an early stage of development. To see this, what else is needed in it, if not.

So in this case only the current increment will need to be changed. Then perhaps new functionality will be defined for subsequent increments.

### **Component-Based Software Engineering**

This is the process model under which an existing design or code (which has already been tested) is tried again to be reused. Which is similar and is the one which is really needed. After which it is modified and included in the new system.

Although the initial “requirements specification” phase and “validation” phase are comparable to other software processes. But, in a reuse-oriented process, the intermediate phases can be different from each other.



Everything about the phases we are telling you is as follows – Component analysis, Requirements modification, System design with reuse and Development and integration.

By the way, basically three types of software components are used in a reuse-oriented process. Such as Web services, Collections of objects and Standalone software systems

So in this way, these three generic process models mentioned above are most commonly used in current software engineering. These process models are especially used for large system development.

A sub-system is developed into a larger system using different approaches. So even though it is convenient to discuss them separately. But on the other hand they are often combined at the time of practice.

### **What is the Components of Software Process**

As we all know that the main objective of any software process is. To develop a product that meets all the requirements of the users.

**There are two main components** of any software process, one is the **Process Management Process** and the other is the **Product Engineering Process**.

In this, the purpose of the process management process is to improve such a software process. With the help of which a cost effective and high quality product can be developed.

On the other hand, the main purpose of the Product Engineering Process. How can such a product or software be developed? Which fully fills all the requirements of the users.

There are three more components in the same product engineering process. Out of which the first is the development process, the second is the project management process and the third is the configuration control process.

### ***Development Process***

This is the process that is run at the time of software development. These processes are performed by programmers, designers and testing personnel using this process. The development process specifies the development of quality assurance activities to be performed in the programs.

### ***Project Management Process***

Project management process is the process of leading a team work to achieve goals and meet success criteria at a specified time. The first challenge of the project management process is to achieve all the goals of the project within the given constraints.

### **Configuration Control Process**

The configuration control process, as the name suggests, works. Whenever any changes are made according to the requirements of the customer, it manages all those changes. It configures all kinds of modifications to happen.

### **What is Software Process Framework**

Framework is a standard way to build and deploy applications. Apart from this, the Software Process Framework is a complete foundation of the software engineering process.

All umbrella activities have been included in the software process framework. Apart from this, it also includes the numbers of all those framework activities. Which is applied to all software projects. Below we are telling you about those five activities of Software Process Framework.

**Communication:** Under this activity, heavy communication requirement has to be collected with customers and other stakeholders.

**Planning:** In this activity we all discuss about technical related task, work schedule, risks, required resources etc.

**Modeling:** Modeling is about creating representations of things in the real world. In modeling activities, a product is modeled for better understanding and requirements.

**Construction:** Software engineering is the application of construction processes that are required to assemble a product. In this activity we generate code and test it to improve the product.

**Deployment:** In this activity, a complete or non-complete product or software is evaluated by the customers and their feedback is represented. On the basis of customer feedback, we modify our products so that we can supply better products.