



Software Project Management

By : PRATEEK SRIVASTAVA

Project

A project is **well-defined task**, which is a **collection of several operations** done in order to **achieve a goal** (for example, software development and delivery). A Project can be characterized as:

Every project may has a unique and distinct goal.

Project is not routine activity or day-to-day operations.

Project comes with a start time and end time.

Project ends when its goal is achieved hence it is a temporary phase in the lifetime of an organization.

Project needs adequate resources in terms of time, manpower, finance, material and knowledge-bank.

Software Project

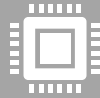
- A Software Project is the complete procedure of software development **from requirement gathering to testing and maintenance**, carried out according to the execution methodologies, in a specified period of time to achieve intended software product.



Need of software project management



Software is said to be an **intangible** product.



Software development is a kind of all new stream in world business and there's very little experience in building software products.



Most software products are **taylor made to fit client's requirements**.

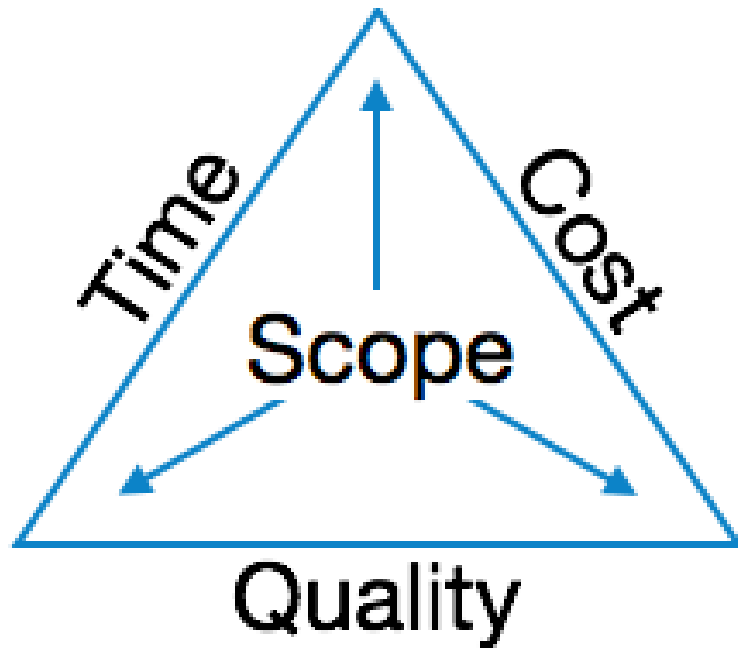


The most important is that the **underlying technology changes and advances so frequently and rapidly** that experience of one product may not be applied to the other one.



All such business and environmental constraints bring risk in software development hence it is essential to manage software projects efficiently.

Triple constraints for software projects



- It is an essential part of software organization to deliver **quality** product, keeping the **cost** within client's budget constrain and deliver the project as per **scheduled**.
- There are several factors, both internal and external, which may impact this triple constrain triangle. Any of three factor can severely impact the other two.
- Therefore, software project management is essential to incorporate user requirements along with budget and time constraints.

Software Project Manager



- A software project manager is a person who undertakes the **responsibility** of executing the software project.
- Software project manager is thoroughly **aware of all the phases of SDLC** that the software would go through.
- Project manager **may never directly involve in producing the end product** but he controls and manages the activities involved in production.
- A project manager closely monitors the development process, prepares and executes various plans, arranges necessary and adequate resources, maintains communication among all team members in order to address issues of cost, budget, resources, time, quality and customer satisfaction.


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Few responsibilities that a project manager shoulders

Managing People

- Act as project leader
- Liaison with stakeholders
- Managing human resources
- Setting up reporting hierarchy etc.

Managing Project

- Defining and setting up project scope
 - Managing project management activities
 - Monitoring progress and performance
 - Risk analysis at every phase
 - Take necessary step to avoid or come out of problems
 - Act as project spokesperson
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Software Management Activities

- Software project management comprises of a number of activities, which contains planning of project, deciding scope of software product, estimation of cost in various terms, scheduling of tasks and events, and resource management. Project management activities may include:
 - Project Planning
 - Scope Management
 - Project Estimation



Project Planning

- Software project planning is task, which is performed **before the production of software actually starts.**
- It is there for the software production but involves no concrete activity that has any direction connection with software production; rather **it is a set of multiple processes, which facilitates software production.**





Scope Management

- It defines the scope of project; this **includes all the activities, process need to be done in order to make a deliverable software product.**
- Scope management is essential because **it creates boundaries of the project** by clearly defining what **would be done in the project and what would not be done.**
- This makes project to contain limited and quantifiable tasks, which can easily be documented and in turn **avoids cost and time overrun.**

During Project Scope management, it is necessary to -

1. Define the scope
2. Decide its verification and control
3. Divide the project into various smaller parts for ease of management.
4. Verify the scope
5. Control the scope by incorporating changes to the scope

Project Estimation

- For an effective management accurate estimation of various measures is a must. With correct estimation managers can manage and control the project more efficiently and effectively.
- Project estimation may involve the following:

Software size estimation

- Software size may be estimated either in terms of KLOC (Kilo Line of Code) or by calculating number of function points in the software. Lines of code depend upon coding practices and Function points vary according to the user or software requirement.

Effort estimation

- The managers estimate efforts in terms of personnel requirement and man-hour required to produce the software. For effort estimation software size should be known. This can either be derived by managers' experience, organization's historical data or software size can be converted into efforts by using some standard formulae.

Project Estimation

- **Time estimation**

Once size and efforts are estimated, the time required to produce the software can be estimated. Efforts required is segregated into sub categories as per the requirement specifications and interdependency of various components of software.

Software tasks are divided into smaller tasks, activities or events by Work Breakthrough Structure (WBS). The tasks are scheduled on day-to-day basis or in calendar months.

The sum of time required to complete all tasks in hours or days is the total time invested to complete the project.

- **Cost estimation**

This might be considered as the most difficult of all because it depends on more elements than any of the previous ones. For estimating project cost, it is required to consider -

- Size of software
- Software quality
- Hardware
- Additional software or tools, licenses etc.
- Skilled personnel with task-specific skills
- Travel involved
- Communication
- Training and support



Software and Software Product

- **Software** is more than just a program code.
- A program is an executable code, which serves some computational purpose.
- Software is considered to be collection of executable programming code, associated libraries and documentations.
- Software, when made for a specific requirement is called **software product**.




Software engineering

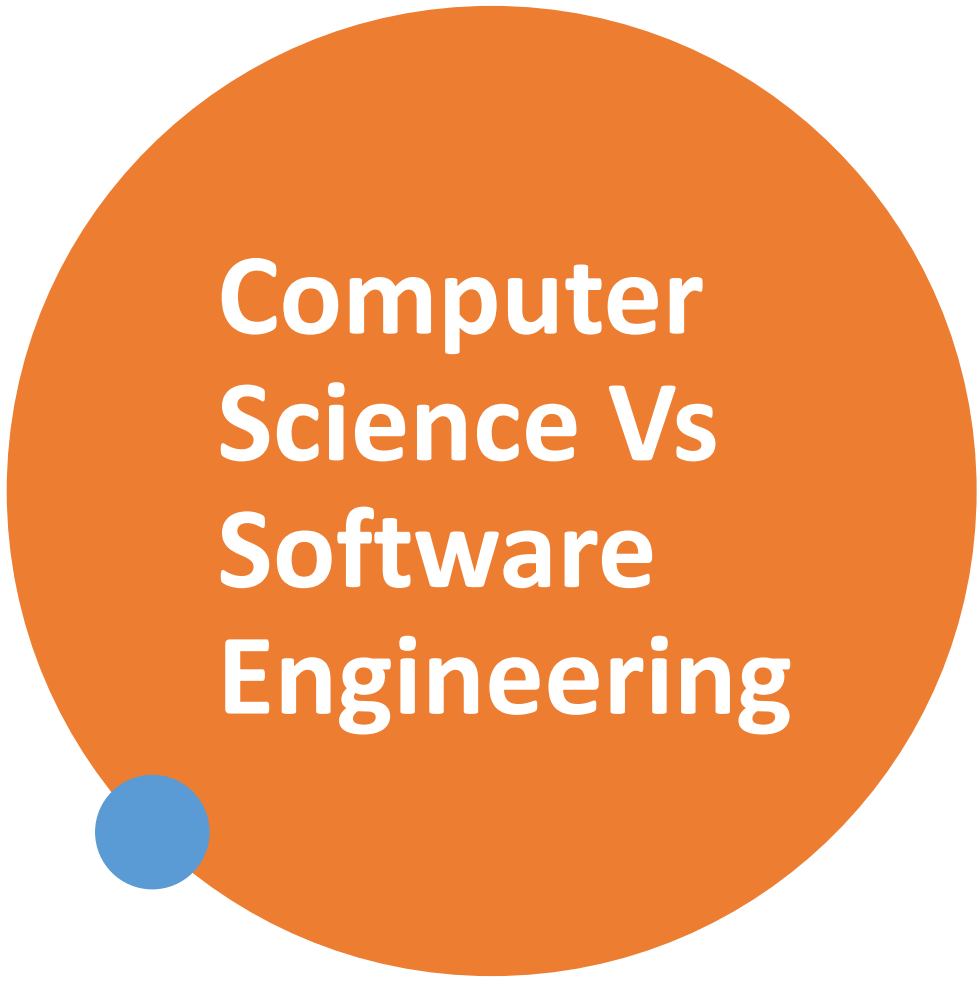
Engineering on the other hand, is all about developing products, using well-defined, scientific principles and methods.



Software engineering is an engineering branch associated with development of software product using well-defined scientific principles, methods and procedures.



The outcome of software engineering is an efficient and reliable software product.



Computer Science Vs Software Engineering

- Computer science focuses on the theory and fundamentals, like algorithms, programming languages, theories of computing, artificial intelligence, and hardware design, while software engineering is concerned with the activities of developing and managing a software.