Software Project Management

we will learn about:

- *software project management in software engineering*

- *important duty for a software project management*

- *project planning activities*

- ***Software project management*** in software engineering is an important factor driving the project from product conception till completion.

- A software project, however, big or small employs project manager.

- The *important duty for a software project management* is:
- To write project proposal,
- Prepare project cost estimation, schedule and staffing
- Help and keep the group of software developers motivated
- Building up teams morale
- Steer project towards successful completion
- An effective *software project management* requires proper project planning, project monitoring and project control.

Project planning

- After feasibility study phase if a project is found to be feasible then the project manager begins project planning.

- Project manager completes this activity before development work starts.

- There are various activities involved in *project planning* as listed below:
- **Project estimation** → When a project is finalized then several estimations need to be made. A proper ***cost estimation*** is required that would be required for project. ***Time estimation*** is needed that would propose the time in which the project would be in deliverable position. ***Effort estimation*** is needed to finalize the resource available and required for the project.
- **Project Schedules** → Schedules for manpower and several other resources has to be prepared that would be needed as the project progress.
- **Project staffing** → Staff needs to be organized and planned. Analysis has to be done to find out if the existing staff is sufficient for the project or new recruitment is required.
- **Project risks and management** → Possible risks to the project needs to identified and its solution needs to found to let project progress smoothly.
- **Project miscellaneous management** → Quality of the product, configuration management plan, etc are some miscellenous task that needs to be planned accordingly.

- Project Size Estimation
- *Project size estimation in software engineering*
- *metrics for project size estimation* - LOC and Function point
- It's important to understand that **project size estimation** is the most fundamental parameter. If this is estimated accurately then all other parameters like effort, duration, cost, etc can be determined easily.

- At present two *techniques* that are used to estimate project size are:
- **Lines of code or LOC**
- **Function point**

- Both of the above serves as important *project size estimation metrics*. Lets study about them.
- **Lines of code**
- **Lines of code** or **LOC** is the most popular and used metrics to estimate size.
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- LOC determination is simple as well. LOC measures the project size in terms of number of lines of statements or instructions written in the source code.

- In LOC count, comments and headers are ignored.

Shortcomings of LOC

- Estimating LOC by analyzing the problem specification is difficult. Estimation of accurate LOC is only possible once the complete code has been developed. As project planning needs to be done before the development work begins so this metrics is of little use for project managers.

- Two different source files having same number of lines may not require same effort. The file having complex logic would require more effort than one with simple logic. Based on LOC proper estimation may not be possible.

- LOC is the numerical measurement of problem size. This metrics will vary to a large extent from programmer to programmer. An experienced professional may write same logic in less number of lines than a novice programmer.

Function point metrics

- **Function point metrics** overcomes many of the shortcomings of LOC.

- Function point metrics proposes that size of the software project is directly dependent on various functionalities it supports. More the features supported the more would be the size.

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- This technique helps determine size of the project directly from the problem specification so is really helpful to project managers during project planning while determining size.

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- Software Project Scheduling

software project scheduling in software engineering
- *project scheduling activities in software engineering*

definition of critical path, work breakdown structure, milestone
- *chart needed for resource allocation, project monitoring and control*

What is software project scheduling?

- **Software Project Scheduling** is a significant project planning step.

- It becomes so important as this decide the time-frame for each task that would be undertaken. It judges the whole plan and points down what would possibly be needed at which time of software project development.

- As part of *project scheduling activities in software engineering*, the *project manager* does following:
- Points out the various tasks that would be done during project.
- Divide the large works into smaller activities or module.
- Find out the dependency among various activities of the software project.
- Determine the probable time that would be needed to complete each tasks.
- Allocate the resources to each activities.
- Plan when to start and when to end each activities.
- Determine the critical path of the project.

- *A critical path is the chain of important activities that would help in determining the duration of the project.*

- So from the above, we can see that determining necessary activities to complete the project is the first step. If the project manager has good experience then this step would be effectively completed. Next the task are broken down into several module following **Work Breakdown Structure**.

- Next dependencies among various activities are determined. Dependencies among various activities are represented in the form of **activity networks**.

- ***After finding dependencies***:
- *resource allocation* is done using **Gantt chart**.
- After resource alloaction, **PERT chart** is prepared for *project monitoring and control activity*.
- The point at which each activity completes is termed as **milestone**.