



LECTURE 08

Project Planning

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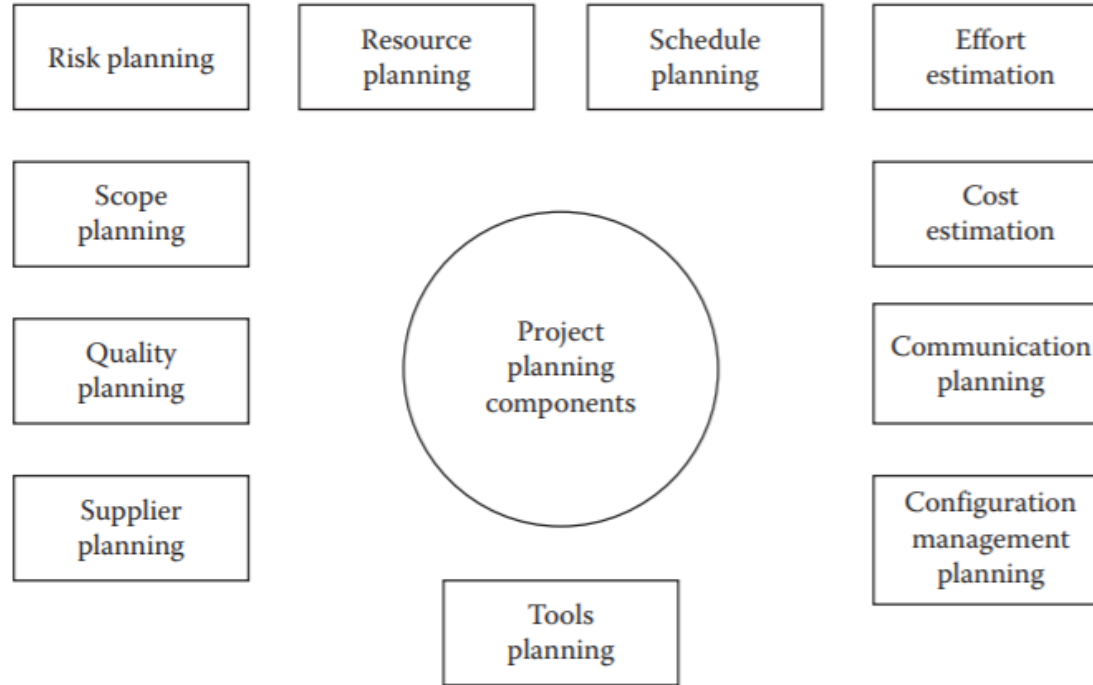
What is Project Planning?

- Project planning for any software project involves making the best trade-off among quality, schedule, cost, and organization benefits which can build up from the project.
- Planning is defined as the intelligent estimate of resources required to perform a predefined project successfully at a future date within a defined environment. This definition of planning contains several key terms.

Components of Project Planning

- The project plan itself consists of a large number of planning components.
- It includes risk planning, resource planning, task planning, effort estimation, cost estimation, communication planning, configuration management planning, tool planning, supplier management planning, quality planning, and scope planning.

The components of Project Planning



Software project planning components.

Types of Project Planning

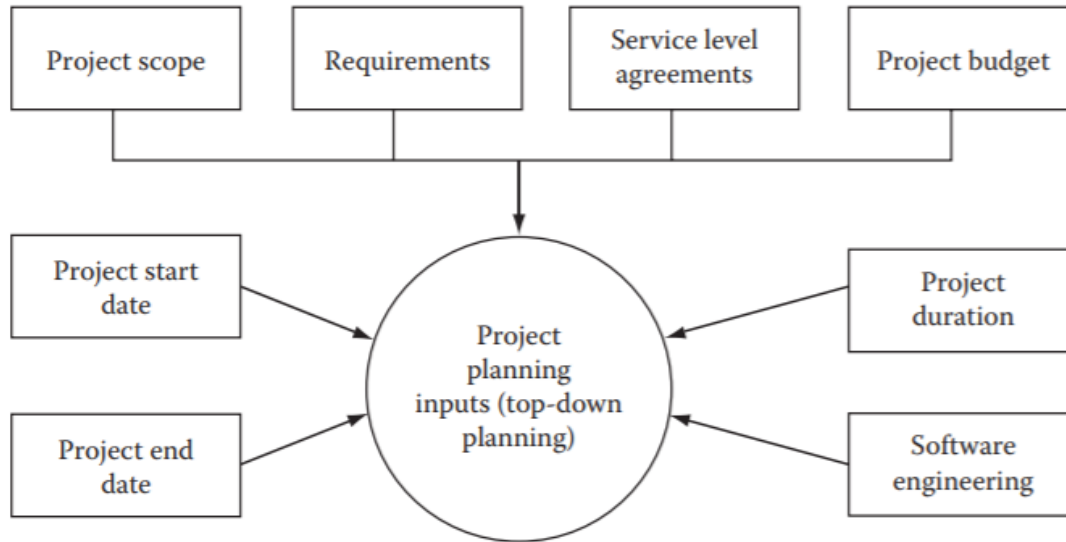
- Depending on time frame requirement of a project, it can be either a top-down project planning or a bottom-up project planning.
- Generally, in the case of product development by software vendors, the project management is a top-down approach, and in the case of custom software development, it is a bottom-up approach.

Types of Project Planning

- Top – down plan:
 - There are a large number of inputs in the case of planning top-down projects.
 - Apart from project scope, and chosen software engineering model and requirements, we have project start date, project end date, project duration, and project budget. All of these details are available to the project team before the start of the project.

Types of Project Planning

- Top – down plan:
 - Input for top – down approach:



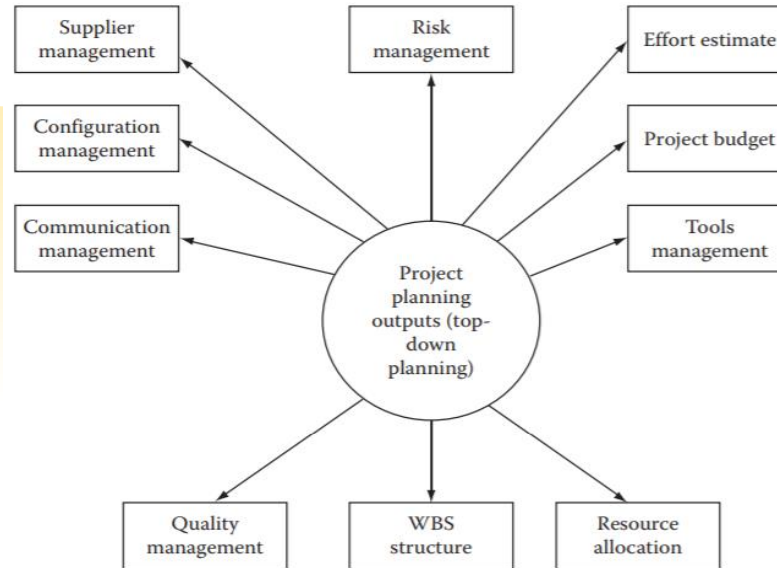
Software project planning inputs for top-down approach.

Types of Project Planning

- Top – down plan:
 - The plan outputs include supplier management, configuration management, communication management, defect prevention strategy, WBS structure, resource allocation, tool management, scope management, effort estimate, and risk management.

Types of Project Planning

- Top – down plan:
 - Output for top – down approach:



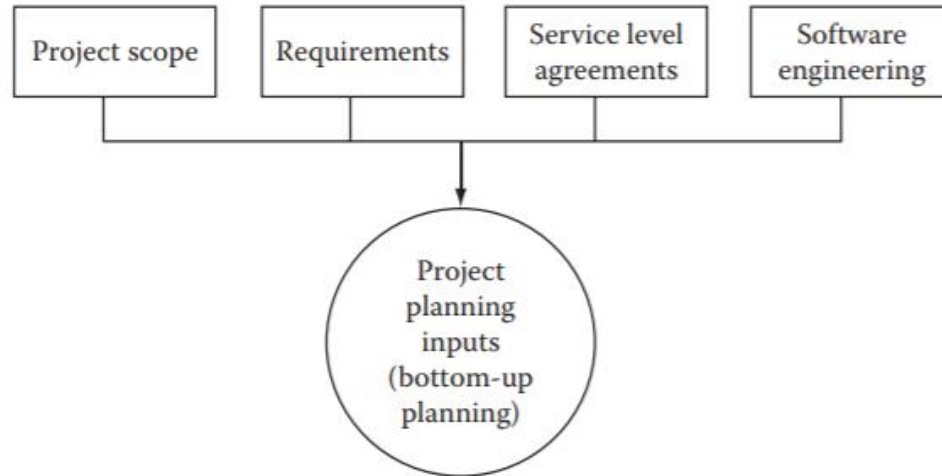
Software project planning outputs for top-down approach.

Types of Project Planning

- Bottom – up plan:
 - Large software projects devoid of much clarity at the beginning of the project tend to have a bottom-up approach for their project planning.
 - At the beginning of the project, effort is made to find out what tasks should be involved in the project and how the project may span out.
 - Project planning requires inputs based on which outputs will be created in form of project plan. Inputs for project planning for bottom-up approach include project scope, SLAs, and chosen software engineering model, along with the all important software requirements.

Types of Project Planning

- Bottom – up plan:
 - Input for bottom – up approach:



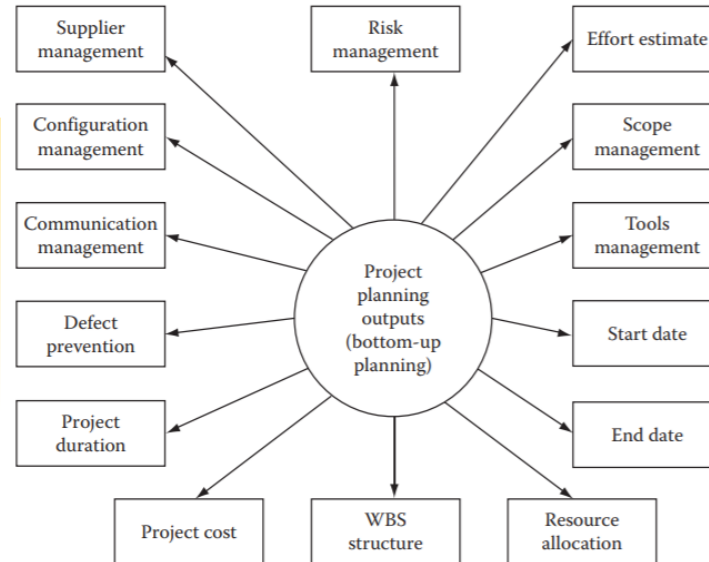
Software project planning inputs for bottom-up approach.

Types of Project Planning

- Bottom – up plan:
 - The project plan output includes supplier management, configuration management, communication management, defect prevention strategy, project duration, project cost, work breakdown structure (WBS), resource allocation, project start and end dates, tool management, scope management, effort estimate, and risk management.

Types of Project Planning

- Bottom – up plan:
 - Output for bottom – up approach:



Software project planning outputs for bottom-up approach.

Techniques of Project Planning

- Project planning is performed through a series of six steps that utilize a number of project management techniques:
 - Work breakdown
 - Time estimates
 - Milestone identification
 - Activity sequencing (Activity networks)
 - Scheduling (Gantt chart)
 - Re-planning
- Three techniques that are suitable for this stage are Work Breakdown Structures, Activity Networks and Gantt Charts.

Techniques of Project Planning

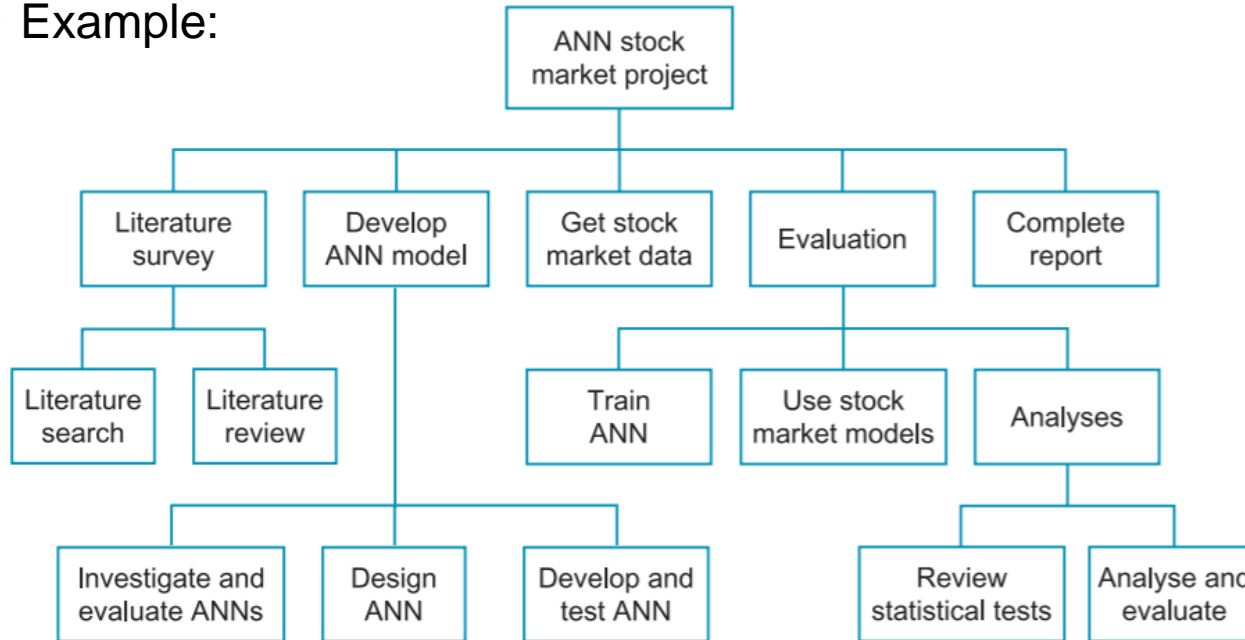
- **Work breakdown:**

- Work breakdown structures (WBSs) are used to break your project down into lower and lower levels of detail to reveal exactly what work you will need to do to complete your project.
- You should begin a WBS by breaking your project down into its main objectives that you identified during your project's definition.
- You might only be able to break your project down into two or three main areas of work or you might be able to identify several broad areas of activity.

Techniques of Project Planning

- **Work breakdown:**

➤ Example:



An example of a work breakdown structure

Techniques of Project Planning

- **Time Estimates:**

- The project is broken down into a number of tasks it is much easier to estimate how long the project will take.
- Focusing now on the lowest level of the WBS it is possible to make reasonably accurate predictions of the effort needed to perform these activities (in example WBS) and consequently the project as a whole.
- You should be reasonably happy with this estimate of the total project effort as it is much more accurate than you could have achieved working from the project's title alone.

Techniques of Project Planning

- **Time Estimates:**

- You might decide to allocate yourself less time to complete particular activities if you feel your estimates for these tasks were conservative.

Techniques of Project Planning

- **Time Estimates:**

- **Example:**

Activity	Estimated duration
Literature search	8 weeks
Literature review	4 weeks
Investigate and evaluate ANNs	4 weeks
Design ANN	4 weeks
Develop and test ANN	2 weeks
Get stock market data	1 week
Train ANN	1 week
Use stock market models	2 weeks
Review statistical tests	2 weeks
Analyse and evaluate	4 weeks
Complete report	8 weeks
Total effort	40 weeks (approximately 10 months)

• Time estimates for example stock market ANN project

Techniques of Project Planning

- **Identify milestones:**

- Milestones are significant steps towards the completion of a project. They help you to appreciate your progress by providing you with intermediate reference points.
- Because you know these milestones are leading you towards the ultimate goal of your project, you can use these as intermediate goals at which to aim.
- To identify milestones you should focus on your project's WBS and identify any key stages that appear to be significant breakthroughs in your project's progress.
- It is best to do this at the top level of the WBS and use some (if not all) of your project's objectives as milestones.

Techniques of Project Planning

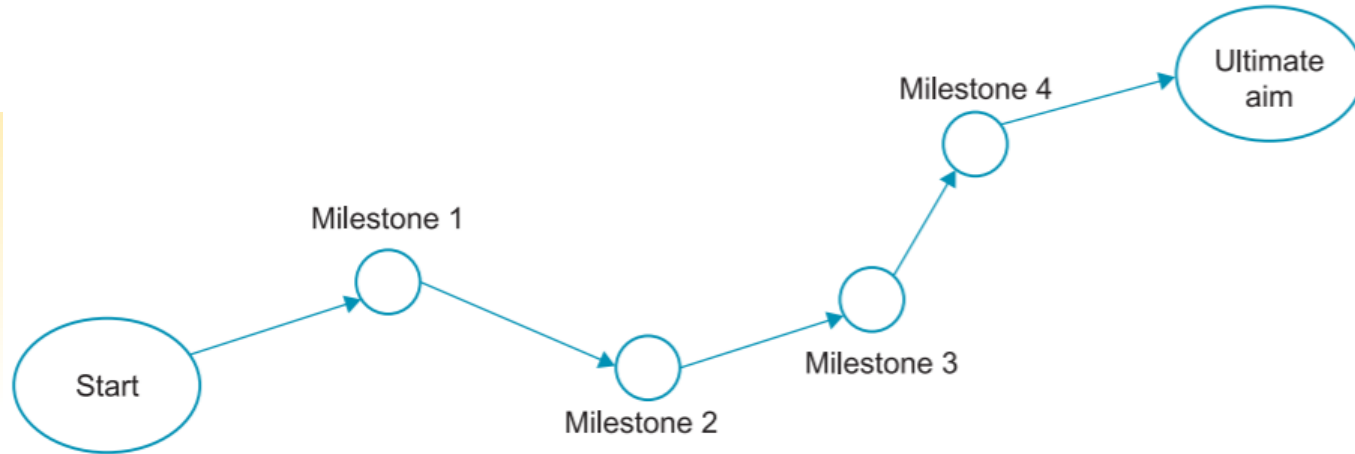
- **Identify milestones:**

- These milestones then identify areas of work that, when completed, indicate you have achieved a significant step along the way.
- The number of milestones that you will identify for your project will vary depending on the project's size.
- For a year-long project, six or seven milestones should be more than adequate as these would represent, on average, the completion of approximately two months' work.
- Milestones can also be associated with the production of various reports, documents or subsystems.

Techniques of Project Planning

- **Identify milestones:**

- Example:



Milestones leading to the project's ultimate aim

Techniques of Project Planning

- **Activity sequencing:**

- Now, we have an understanding of the work you need to perform in the project and the effort required to complete the individual tasks involved.
- An activity network can now be used to identify the order in which you should perform that work.
- Activity networks were first developed towards the end of the 1950s and are sometimes referred to as PERT networks (program evaluation and review technique), CPM (critical path method) or network diagrams.

Techniques of Project Planning

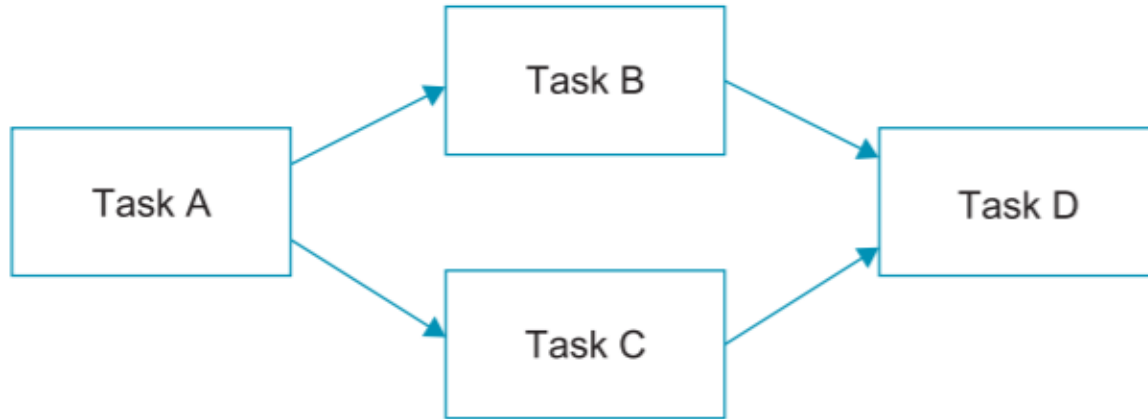
- **Activity sequencing:**

- Two forms of activity network were developed at that time: *Activity on the arrow networks* and *Activity on the node networks*
- We will look at the simplest form of these diagrams in which activities are represented by rectangles or nodes – the activity-on-the-node network.
- Activity-on-the-node diagrams represent the tasks you are performing in your project as nodes connected by arrows.
- The arrows show the order in which activities must be performed

Techniques of Project Planning

- **Activity sequencing:**

- Example:



An example of a simple activity-on-the-node diagram