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Managing Projects

Chapter Overview

At the start of your engineering career, you will likely only be responsible for a part of a project. However, as you become more experienced, your responsibilities will expand and you may be asked to manage one or more projects. As such, the ability to manage projects effectively is crucial for your success as an engineer.

The textbook defines a project as an activity with a defined start and end point, a defined set of deliverables, and a set of constraints and objectives. Typically, project management consists of five phases: [1] initiation, [2] gathering information, [3] planning, [4] implementation, and [5] finalization. After the initiation of a project, you will need to determine the overall objective of the project, as well as the constraints on the project that must be respected. You will also need to gather information regarding what steps must to be taken, how long each step will take, how many resources each step will take, and what are the sequences of the steps.

During the planning phase, you will construct an activity network diagram using the information you have gathered. You will use the diagram to determine the "critical path" of the project, and plan resource allocation to meet project objectives and constraints. Typically, all projects involve as least two types of resources: time and money. It is often possible to spend more of one resource to save another resource. For example, it is possible to spend money to save time. For example, it is possible to hire external consultants or additional personnel to speed up a project. During the planning phase, you will also create deadlines distributed throughout the project.

It is not possible to plan a project just once. Every project involves uncertainties, and unexpected situations and difficulties can arise. As such, project management is an iterative process. During implementation, the project plan is revisited every time a major deadline is reached. Because modern project management is a complex endeavour involving a lot of data, tools such as Gantt

charts and project management software can be very useful to project managers.

The nature and emphasis of project management can differ between industries, and different project management approaches may be appropriate for different projects. The textbook focuses on a project management approach called "Waterfall". This approach is useful when project objectives and constraints, including resource availabilities, are known or knowable at the beginning of the project. The alternative "Agile" management approach is often used in software engineering and start-up settings.

Learning Objectives

In this chapter, you will:

- learn about the major steps of project management;
- learn about two resources common to most projects: money and time; and
- learn about spending more of one resource to save another resource.