Unit 1: Introduction to Software Project Management

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Objectives

After studying this unit, you will be able to:

- Recognize project
- Describe software project vs. other types
- Explain activities by software project management
- Discuss problems with software projects

Introduction

Software project management includes the tools, techniques, and knowledge essential to deal with the growth of software products. In Software Project Management, the end users and developers require to know the cost of the project, duration and length. It is a process of managing, allocating and timing resources to develop computer software that meets necessities. It consists of eight tasks:

- Problem Identification
- Problem Definition

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- Project Planning
- Project Organization
- Resource Allocation
- Project Scheduling
- Tracking, Reporting and Controlling
- Project Termination

In problem identification and definition, the conclusions are made as approving, declining or prioritizing projects. In problem identification, project is recognized, defined and justified. In problem definition, the use of the project is clarified. The main product is project proposal.

In project planning, it explains a series of actions or steps that are needed to for the growth of work product. In project organization, the functions of the personnel are incorporated. It is done in corresponding with project planning.

In resource allocation, the resources are allocated to a project in order that the goals and objectives are attained. In project scheduling, resources are allocated so that project objectives are attained within a sensible time span.

In tracking, reporting and controlling, the process engage whether the project results are in accordance with project plans and performance specification. In controlling, suitable action is taken to correct improper deviations. In project termination, the concluding report is submitted or a release order is signed.

Did u know? What is Project Management?

The methods and regulation used to define goals, plan and monitor tasks and resources, identify and resolve issues, and control costs and budgets for a specific project is known as project management.

1.1 What is Project?

A project is a sequence of unique, complex, and connected activities having one goal or purpose and that must be completed by a specific time, within budget, and according to specification. This definition tells us quite a bit about a project. To appreciate just what constitutes a project let's look at each part of the definition.

1.1.1 Sequence of Activities

A project includes a number of activities that must be completed in some particular order, or sequence. An activity is a defined chunk of work. The chain of the activities is based on technical requirements, not on management concern. To conclude the sequence, it is helpful to think in terms of inputs and outputs as follows:

- What is needed as input in order to begin working on this activity?
- What activities produce those as output?

Notes The output of one activity or set of activities becomes the input to another activity or set of activities.

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Unique Activities

The activities in a project must be unique. A project has never happened before, and it will never happen again under the same conditions. Something is always different each time the activities of a project are repeated. Usually, the variations are random in nature—for example, a part is delayed, someone is sick, a power failure occurs. These are random events that can happen, but we never are sure of when, how, and with what impact on the schedule. These random variations are the challenge for the project manager.

Complex Activities

The activities that make up the project are not simple, repetitive acts, such as mowing the lawn, painting the house, washing the car, or loading the delivery truck. They are complex. For example, designing an intuitive user interface to an application system is a complex activity.

Connected Activities

Connectedness implies that there is a logical or technical relationship between pairs of activities. There is an order to the sequence in which the activities that make up the project must be completed. They are considered connected because the output from one activity is the input to another. For example, we must design the computer program before we can program it.

Unconnected Activities

You could have a list of unconnected activities that must all be complete in order to complete the project. For example, consider of developing a payroll system. With some exceptions, the different modules of payroll system like, data entry module, updation module, calculation module, etc. can be developed separately in any order. But the pay roll system as a whole cannot be completed until all its modules are completely developed, but the different modules may be developed in any order. So developing a payroll system with various modules in which the modules can be developed in any order is not considered a project according to the definition.

1.1.2 One Goal

Projects must have a single goal.

Example: Consider the development of Management Information System (MIS) project for an institute. Each module of the MIS like, Personal information system accounting system, administration control system, examination system can be consider as a subproject, each of which is a project in its own right.

This division makes for better management control. This artificial decomposition of a complex project into subprojects often simplifies the scheduling of resources and reduces the need for interdepartmental communications while a specific activity is worked on. The downside is that the projects are now interdependent. Even though interdependency adds another layer of complexity and communication, it can be handled.

1.1.3 Specified Time

Projects have a specified completion date. This date can be self-imposed by management or externally specified by a customer or government agency. The deadline is beyond the control of anyone working on the project. The project is over on the specified completion date whether or not the project work has been completed.

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1.1.4 Within Budget

Projects also have resource limits, such as a limited amount of people, money, or machines that are dedicated to the project. While these resources can be adjusted up or down by management, they are considered fixed resources to the project manager.

Example: Suppose a company has only one Web designer at the moment. That is the fixed resource that is available to project managers. Senior management can change the number of resources, but that luxury is not available to the project manager. If the one Web designer is fully scheduled, the project manager has a resource conflict that he or she cannot resolve.

1.1.5 According to Specification

The customer, or the recipient of the project's deliverables, expects a certain level of functionality and quality from the project. These expectations can be self-imposed, such as the specification of the project completion date, or customer-specified, such as producing the sales report on a weekly basis.

Although the project manager treats the specification as fixed, the reality of the situation is that any number of factors can cause the specification to change. For example, the customer may not have defined the requirements completely, or the business situation may have changed (this happens in long projects). It is unrealistic to expect the specification to remain fixed through the life of the project. Systems specification can and will change, thereby presenting special challenges to the project manager.

Task Connectedness implies that there is a logical or technical relationship between pairs of activities. Explain

Self Assessment

Fill in the blanks:

1. In project planning, it explains a series of actions or steps that are needed to for the growth of ..... product.
2. A project has never happened before, and it will never happen again under the …… conditions.
3. In project scheduling, resources are allocated so that project objectives are attained within a sensible .....
4. The chain of the activities is based on technical requirements, not on management .....

1.2 Software Projects vs. Other Types

Software Projects

Software projects are disreputably hard to define. Unlike a house, you can't see software or touch it or feel it or visualize it and it's hard for the layman to get a theoretical grip of its size or cost or how long it might take to construct. Software projects have numerous properties that make them exceptionally different to other kinds of engineering project. The properties of Software Projects are as follows:

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- ***The technology changes very rapidly:*** Most large software projects utilize new technology; for many projects.
- ***The product is intangible:*** It's very difficult to declare a bridge is 90% complete if there is not 90% of the bridge there. It is easy to declare that a software project is 90% complete, even if there are no visible outcomes.
- ***Large software projects are generally modified:*** Most large software systems are one-off, with experience gained in one project being of little help in another.
- ***We don't have much knowledge:*** Software engineering is a new discipline, and so we basically don't have much understanding of how to engineer large scale software projects.

Examples:

- Freshmeat
- Apache Software Foundation
- CPAN
- CTAN
- CRAN

Construction Projects

The project produces an artifact. The worth generated by the project is implanted in the artifact. The artifact may be a compound system with human and mechanical components.

Examples:

- Warship
- Jubilee line extension
- Millennium dome
- Customer call centre
- Method guidebook
- IT system

Research Projects

The project generates information. The information may be formally symbolized as models, patterns or patents. Or the information may be embedded in a working process or artifact.

Examples:

- Business modeling
- Developing a model of the UK economy
- Developing a new species of wheat
- Developing novel approaches to project management.
- Military intelligence/code breaking.
- The analysis, testing, QA or evaluation portions of a larger project.

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Reengineering Projects

The project generates a desired change in some system or process.

Examples:

- Taking sterling into the Euro
- Renumbering the UK telephone system
- Implementing PRINCE project management practices into a large organization.
- Designing and installing an Intranet.

Procurement Projects

The project create a business relationship contractually based with a chosen supplier for a describe product or service based on a fixed specification and/or a described specification process.

Examples:

- Outsourcing a specific construction or research project
- Outsourcing a complete business function (such as IT).
- Imposing new rules and measures on a regulated industry.

Business Implementation Projects

The project constructs an operationally effective process. The value generated by the project is embedded in the process.

Examples:

- Developing a new business process to repackage and exploit existing assets.
- Installing e-commerce

Some Projects are difficult to classify under this Scheme

Nationalized symbolic programmes:

- Putting a man on the moon by the end of the decade.
- Mitterrand's Grandes Projects.
- New Labour

Huge medical programmes:

- Creating an artificial heart.
- Mass inoculation programmes.

Other hybrid or interdisciplinary projects

- Pilot projects
- Moving offices

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Caution In most cases, this complexity occurs from an ambiguity about the primary purpose of the project.

Where do we start? How do we know when to stop? When can (should) we evaluate the results?

Each type of project yields miscellaneous answers to these questions - and this implies that each type of project needs a somewhat different process and management style.

	Start	**Stop**	**Evaluate**
Construction	With a set of requirements. With a defined solution.	When the artifact is "complete". When the requirements are satisfied.	On delivery of the artifact. Over the lifetime of the artifact.
Research	With a hypothesis. With a problem.	When the time runs out. When we detect diminishing returns.	When the knowledge is confirmed or disconfirmed by later work. When the knowledge is used by later work.
Reengineering	With a problem. With an opportunity. With an (imported) solution.	When we seem to be ahead of the game. When some higher process changes the game we're playing.	At any time.
Procurement	With a set of requirements. With a defined solution.	We construct a tender document that is "complete". We sign a contract with the supplier who seems to be ahead at the end of the tender period.	Over the lifetime of the contract. On completion of the contract.
Business Implementation	With an opportunity. With a business concept.	When the process is operational. When the process has been running smoothly for a defined period. When the business benefits are starting to become visible.	When the process has been running smoothly for a defined period. When the business benefits are starting to become visible. Over the lifetime of the process.

1.3 Activities by Software Project Management

1.3.1 Planning

Project planning is a feature of Project Management, which includes of various processes. The aim of these processes is to make sure that various Project tasks are well coordinated and they meet the various project goals including timely completion of the project. Project Planning is a feature of Project Management that focuses a lot on Project Integration. The project plan shows the current status of all project activities and is used to observe and control the project.

The Project Planning tasks ensure that various elements of the Project are coordinated and therefore guide the project execution.