Overview

Unit 3 is organized into nine sections. This overview and introduction are related to project management and are followed by a section on functions of senior management and the project manager. Section 3 discusses the causes of IS project failure. Section 4 is dedicated to process management. The following section covers the major aspects of project management — project planning, project estimation, project control. In Section 6, the project management techniques and tools are discussed. In Section 7, you will learn how to use Microsoft-Project® as a management tool in IS development projects. Because at any given time companies may have several IS projects under way, you will be introduced to the concept of portfolio management in Section 8 to learn how systems development projects are selected and initiated and how to manage risk associated with IS development projects. Finally, the last section contains a summary of Unit 3, a revisit of the Orient-Pacific Insurance Corporation, references and a glossary of terms.
Introduction

Unit 2 described a systems development life cycle methodology. The SDLC is not, in itself, a complete project management methodology. Formal and documented phases of the SDLC provide a framework for management control. However, they must be complemented by a project management process before that control can be realized. In practice, most commercial systems are too large to be developed by one person in an acceptable period of time. It is rare for a single user to understand an entire system well enough to be able to define all the requirements. Accordingly, systems development is typically undertaken by teams of developers who regularly review their progress with groups of users. Such complex co-ordination and interactions must be managed.

In this unit, you will learn about various aspects of planning, scheduling and controlling of IS development projects. These activities together constitute what is called project management. You should note that these management activities do not contribute directly to the production of a system, but are absolutely essential to the success of the system’s development. A systems development project can be thought of as two separate streams of activity. One stream focuses on the actual development, creating the system. The other focuses on managing that development process, ensuring that the system is developed efficiently and effectively. This management activity is often the responsibility of a senior developer, a project leader or project manager.

Project planning involves identifying development activities and estimating their effort and duration. Major phases are determined before being subdivided into the specific activities and individual tasks that are required to complete a project. Once activities and tasks are identified, the duration and effort that is required to actually perform them is estimated. Estimating is a difficult part of planning and will be described under a separate topic, project estimation.

Project scheduling involves allocating staff and resources to activities and determining a sequence in which activities are performed. The basic sequence is implicit in the SDLC, although this provides no more than a skeleton. An eventual schedule must take account of the effort and duration of each activity, relationships between different activities and availability of staff and resources that are required to complete each activity.

Project control involves coordinating development activities, monitoring progress and reviewing deliverables. Controlling requires comparing actual performance with planned performance, as a project progresses. When necessary, corrective action is required to return performance to plan or to change the plan.

Readings

‘What is project management’, pp. 123–131 in your text.
Objectives

By the end of Unit 3, you should be able to:

1. Define the functions and roles of senior management in IS development projects.
2. Explain the major functions of a project manager.
3. Explain why projects fail.
4. Explain the differences between project and process management.
5. Discuss the major activities involved in project management.
6. Describe the purpose of project estimation.
7. Discuss the purpose and objectives of project control.
8. Define the tasks and products associated with project control.
9. Describe project management techniques and tools.
10. Demonstrate the use of Gantt charts and critical path analysis.
11. Describe the capabilities of a project management software product (MS-Project®).
12. Discuss the concept of portfolio management.
Functions and roles of senior management and the project manager

Senior management’s roles

Executive or senior management plays several roles in systems development projects:

- They are interested in what might be developed and how it can make an organization work better.
- They are interested in what resources are required to develop a new system, how long it will take and how much it will cost.
- They make decisions about development efforts, selecting between alternatives and making trade-offs. They decide, at specific checkpoints, whether to abort or to continue a project.
- They need to assess the effectiveness of decisions which lead to the implementation of a system. When a project is complete, performance and success of the project must be measured and reviewed. This is the objective of the Review Phase.

Project manager’s roles

The project manager needs to have a set of skills different from those of an analyst. In particular he/she should be able to:

Define the project scope. Usually in written form, project definition contains a brief description of the problem or opportunity addressed by the project, its goals and objectives and projects assumptions and constraints.

Plan for project requirements. Estimating resource requirements — manpower, time, cost — is one of the main functions of the project manager.

Schedule and organize project efforts. The roles and responsibilities of the project team need to be outlined, time requirement for each task needs to be estimated, taking into account the deadlines.

Controlling the project. Control is one of the most important aspects of management. Projects usually fail if there are no adequate control mechanisms in place to evaluate the progress of the project. Control entails continuous monitoring of tasks, costs, schedules and expectations. Effective management of all these elements is crucial in the success of the project.

Reading


This reading helps you achieve Objective 2 of this unit.
Why projects fail

Like all other projects, IS development projects, if not managed properly, fail. The causes behind IS failure are numerous, ranging from bad planning, improper estimation, inappropriate methodology, etc. Sometimes IS projects fail because of technical issues; however, the majority fail due to behavioural, organizational, managerial or economic issues.

It is important to recognize that the majority of tasks and activities in an IS project are interdependent and, as such, a delay in one task may indeed lead to the delay of the whole project.

Fred Brooks (1975), in a very readable and amusing book, introduced the concept of the mythical man-month. The crux of his argument is that as a project falls behind schedule, the project manager usually tries to allocate more personnel to accelerate the rate of progress. But because extra effort is required to coordinate the activities of the additional personnel, the law of diminishing return presents itself, delaying the project even further. In other words, if a project misses the milestones set in different phases of a project, it is very difficult to catch up later on by simply adding additional human resources.

Perhaps one of the most common causes of IS failure is the attempt to cut corners by skipping requisite steps in a methodology. What do you usually do if you are late in one of your programming assignments? Would you most likely skip the documentation of the programme and focus your attention solely on coding? The problem with this strategy is that if somebody asks you to change some part of that programme at a later time, in the absence of proper documentation you would have a very hard time understanding the inner working and logic of the program! The same is true in real life. Taking shortcuts around a methodology will compromise the integrity and adaptability of an IS project, leading to its failure in the long-run.

One of the toughest parts of an IS project manager’s job is to manage changes caused by user expectations or business requirements over the course of a project. As discussed in Unit 1, IS are dynamic systems that need to be adaptable. This is particularly true when we are in the process of developing a system. Therefore, it is important to take appropriate management measures to take into account changes in system requirements in order to prevent slippage and delays. The slippage and delays are usually caused by scope creep and/or feature creep. Scope creep refers to changes in a project’s scope caused by changes in user expectations or business requirements. Feature creep, less severe than scope creep, but still a serious cause of cost overrun and schedule delay, refers to addition of new technical features without considering the impact of the additional work on the project’s budget and schedule. Both scope and feature creep need to be managed by adjusting periodically the project’s schedule and budget.
Reading

'The causes of failed projects', pp. 125–126 in your text.

This section outlines the sources of IS failure. This reading helps you achieve Objective 3 of this unit.
Process management

The early 1990s saw a surge of interest by companies to manage their business processes effectively. As we discussed in Unit 1, process reengineering and quality management go hand in hand. Like other business processes, IS development efforts need to be managed with the objective of streamlining business processes and adding value to business. In this context, then, process management refers to the establishment and application of a development methodology in order to achieve consistency in the IS development process and to enable adaptability to new situations.

You should note that the application of a consistent methodology does not ensure quality, something which starts with standards. Therefore, it is imperative to devise and adhere to standards devised particularly for IS development projects.

Reading

‘Process management’, p. 125 in your text.

This reading provides a further elaboration of the concept, its relation to quality management and the role of metrics and standards. This reading relates to Objective 4 of this unit.
Project management activities

Project planning

Planning is absolutely critical to managing a development process. Project planning has several objectives, depending on the stage of development:

- To provide a quick check for feasibility of the project.
- To provide a review of the project before its commencement; this is a detailed plan of an entire project (at activity level) which provides a detailed estimate of project costs and time-scale.
- To provide a review of a project prior to commencing each phase; this is a detailed plan (at task level) which provides a means of monitoring and controlling progress of that phase.

Successful planning requires that project milestones are established. A milestone is a planned point in a development process when a major deliverable is to be produced. Milestones mark the completion of major pieces of work. Successful planning also requires the participation of users. From the start of the project and throughout its existence, it is important that users have a complete understanding of project milestones and deliverables.

Planning may be an informal and almost spontaneous process. This can be appropriate, if a project planner is experienced and the project is small and well-defined. More often, systems development planning is a deliberate and formal process. Time is required to plan a project properly at the necessary level of detail. Whether a planning process is long or short, results should always be documented and distributed to both users and developers.

Planning tasks

Planning a systems development project means determining what must be done to create an installed working system, who is to be assigned to complete these activities and when these activities are to be done. Specifically, planning involves:

- **Deciding a development strategy.** In selecting a strategy, a project is partitioned into manageable phases. Reasons for partitioning are to maintain user interest, to improve communication and to control the development process. The time taken to complete long projects discourages users. Enthusiastic users become interested in other issues or a key user may be transferred to another position. Each phase of a project provides a checkpoint. These checkpoints provide for formal communication between developers and users. They also provide an opportunity to review progress to date and to determine the next course of action.

- **Establishing project milestones.** Initial milestones are determined by the phases described by an SDLC. The end of each phase forms a project milestone. Large, extensive phases require additional milestones to be established within them. Each milestone is identified by a physical product or deliverable.
• **Determining specific development activities and individual tasks.** Activities and tasks required to complete the development of a system and to manage this development process must now be determined. Again, the SDLC provides a framework for this planning task. Standard tasks are well known and established in advance as part of an SDLC. Individual project needs are met by identifying specific project tasks in relation to this standard structure (e.g., what needs to be done that cannot be achieved by standard tasks). This process results in a hierarchical list of activities and tasks. This list is known as a ‘work breakdown structure’.

• **Estimating effort and duration required to complete each activity and task.** You have to estimate effort and duration for each development activity and task. Effort is the amount of time required to complete a task, usually measured in person-days or person-weeks. Duration or elapsed time is the calendar time required to complete a task, usually measured in days or weeks. You should note that calendar time refers to ‘project days’ or ‘working days’.

• **Scheduling activities and tasks, allocating staff and resources to a development process.** Activities and tasks are scheduled in a time sequence. A project schedule must take account of:
  - estimated effort and duration of each task (e.g., how much calendar time is required for a task and how much work is involved in that task?)
  - relationships between tasks (e.g., which tasks can be scheduled simultaneously and which must be scheduled sequentially as they require outputs or products of a previous task?)
  - skills and resources required to accomplish each task (e.g., does a task require particular skills, experience or other resources?)
  - availability of skills and resources (e.g., are there limitations on the availability of particular staff and particular resources?)
  - need for training (e.g., are particular skills lacking and is training necessary?)

All these variables must be balanced in producing a project schedule. Staff and resources must be specifically allocated to tasks. Skills and experience must be matched with task requirements. At the same time, external constraints are taken into account. Such constraints include such items as a time deadline or limited staff resources. Ideally, system requirements should determine the project schedule (e.g., how much time and what resources are necessary to produce a system that meets these requirements?) In practice, deadlines are often imposed and staff resources are limited (e.g., which requirements can be met within the time and staff constraints allowed?)

• **Producing planning documentation for a project.** A planning process culminates in the generation of a number of reports and plans.
Work breakdown structure

A work breakdown structure is a hierarchical list of activities and tasks required to complete a project. Project phases are partitioned into activities; activities are then partitioned into tasks. An SDLC provides an initial work breakdown structure in the form of a checklist of standard project phases, activities and tasks. Such prescribed checklists are a useful starting point for a work breakdown structure. However, each development project is different and activities and tasks must be ‘customized’ to address particular objectives of a development. Checklists cannot substitute for experience in determining a final project plan. In the next section we will introduce several techniques that can facilitate various aspects of project management.

Project estimation

A project plan is a necessary part of project management. It is a ‘road map’ for development activity. To be useful a plan requires a reasonable estimate of effort and duration of project phases, activities and tasks. Also, management is unlikely to approve a plan without an estimate of development costs.

A major difficulty is that a plan and estimates of duration and cost are required early in a project—before detailed requirements are known, before team members and their abilities are known, before details of a systems architecture are known. You are required to estimate on the basis of little information. A phased approach allows you to revise estimates at the end of each phase, as more details of a system are developed. At each of these milestones, management has an opportunity to review revised estimates and to determine whether or not to proceed with a project.

Purpose of estimating

Estimates are required for many participants in a systems development project. While their requirements of estimates may overlap, they are not the same. Management needs estimates for making business decisions about approving a project. Users need estimates to make recommendations to management and for planning resources. Information systems management needs estimates to develop a detailed plan, assign work and control development activity. Systems developers need estimates to plan and control their individual work.

Also, estimates depend on the stage of a project. In the early stages, only approximate costs and duration are required. Later there is a need for more detailed estimates. Estimating is a difficult task. However, a carefully calculated estimate which is inaccurate can still be very useful. Analysis of the causes of inaccuracy can help improve the accuracy of estimates in future projects.

Project control

Project control has two aspects:
• **Controlling project performance.** This involves tracking actual progress, monitoring progress against plan and reporting project status; you identify deviations from plan and problems early enough to enable you to initiate corrective action.

• **Controlling changes to requirements.** This involves evaluating and approving requested changes to requirements; you ensure that only worthwhile and necessary changes are accepted and that project plans are altered to reflect any additional work.

**Tracking, monitoring and reporting**

*Project tracking* involves collecting data on actual progress. Typical reports that you use to track progress include time sheets, task completion reports, computer usage analysis, expense forms and invoices.

- Time sheets are submitted, usually weekly, by each individual team member. They indicate time spent on direct project tasks, indirect project activities (e.g., training, meetings), non-project activities (e.g., maintenance on another project or system) and indirect activities (e.g., illness, vacation). This is the source of information on effort expended on a project and is the basis for monitoring personnel cost and usage.

- Task completion reports are submitted, on completion of specific project tasks or work packages, by the individual responsible for that work. They record a task identifier, the person responsible and the date of completion. This is the basis for monitoring a project schedule.

- Computer usage analysis is submitted, usually weekly, by operations. It indicates computer resource usage. This is the basis for monitoring computer resource cost and usage.

- Expense forms are submitted, on incurring a project expense, by individual team members. They record specific expense items chargeable to a project (e.g., travel costs).

- Invoices are submitted, usually monthly, by external suppliers of resources, services or equipment. They record specific expense items chargeable to a project (e.g., contract programming, special hardware, special forms).

*Project monitoring* involves comparing actual progress to plan. Factors to be monitored include schedule, effort and cost:

- Schedule, for both individual team members and the project, is monitored on the basis of tasks or work packages completed; major inputs are task completion reports.

- Effort, for both individual team members and the project, is monitored on the basis of person-hours or person-days; major inputs are time sheets and invoices for contract labour.

- Cost is monitored on the basis of significant expense items; major inputs are time sheets, computer usage analysis, expense forms and invoices.
You monitor progress on a periodic basis and at major milestones. You identify deviations and problems early enough to enable you to initiate corrective action. Corrective action can include increasing development staff, reducing project scope or revising project plans and schedules.

**Project reporting** involves preparing periodic reports, usually monthly, on the progress of a project. You prepare these reports for all project participants: management, users and developers. You summarize actual progress versus plan and explain deviations and changes from the plan. Your report should cover schedule, effort and costs.

### Change control

Change during a project is inevitable. Change may be mandated as a result of changes to legal requirements, organizational policy, business environment or resources available for a project. Change may be optional as a result of a revised problem analysis, advances in technology or the impact of another project. Whatever its source, change is disruptive and costly; it cannot be ignored, but must be controlled.

A change control procedure is a standardized approach to handling changes to a project. This procedure documents how changes are initiated, evaluated, approved and implemented.

- Changes can be initiated by any participant in development. You submit a change request on a standard form. You are required to describe your requested change and the likely benefits.

- Detailed evaluation takes time and money (and takes development staff away from actual development activity!). Therefore, change requests are first evaluated by a project manager and user representatives. Only changes considered worthwhile are evaluated in detail. Detailed evaluation consists of an assessment of work that is necessary, documentation that is required and cost and schedule implications.

- Change approval depends upon the scope of a change. A minor change that does not affect date of completion, project costs or project scope can be accepted upon agreement by a project manager and user representatives. A major change that has an impact on any of these factors must be approved by a higher authority — management or a project steering committee.

- Upon approval, a change is implemented and documented. You alter project plans and assignments to reflect a change. Notice of a change should be communicated to all participants.

You should log all change requests to record their current status. You should also inform originators as to the progress of their change request.
Project management techniques

The main challenge of project planning and scheduling is in interrelationships between tasks. Tools for supporting planning and scheduling are directed towards dealing with these interrelationships. These tools are known generically as ‘network analysis’ techniques. Two examples presented in your textbook are project evaluation and review technique (PERT) and critical path method (CPM). Another standard technique for displaying project schedules is a Gantt chart or bar chart. All these techniques use a graphic method of representing the project schedule.

Network analysis

Network analysis is a graphic tool that shows a sequence of tasks, relationships between tasks and time requirements of a project. An example of basic notation is shown in Figure 3.1 (different techniques use slightly different notation).

![Network analysis notation](image)

Figure 3.1  Network analysis notation

Note that the critical path is not fixed. As a project progresses, actual times become available. Some tasks will be completed earlier, others later than planned. These changes could affect the critical path which should therefore be constantly recalculated. This is a tedious task if done manually. Numerous project management software packages for automating the analysis of project networks are available. A brief description of one of these packages, Microsoft-Project®, is provided in the next section.

Gantt chart

A Gantt chart is a graphic tool for planning, monitoring and controlling a project. It is a matrix showing project activities or tasks in rows and time periods, weeks or days, in columns. The duration of each activity or task is represented by a horizontal bar on the chart. Actual versus plan duration is shown by using two bars either of different colour or of different thickness. A sample Gantt chart is shown in Figure 3.2 (plan duration is shown with a thin line, actual duration with a thick line).
Figure 3.2  An example of a Gantt chart

Gantt charts are often generated from PERT or CPM diagrams:

- List all tasks in the first column — in chronological sequence determined by network analysis.
- Determine time period (days or weeks) for each ‘period’ column — show the actual dates at the top of appropriate columns.
- Draw horizontal bars to show planned duration of each task — each bar starts at the early start time determined from network analysis.
- Label each bar with estimated effort for that task.
- When known, list individual or individuals responsible for each task in the second column.
- As project progresses, draw horizontal bars to show the actual duration of each task.

Unlike PERT or CPM networks, Gantt charts do not directly show task dependencies. On the other hand, they do show actual time periods and have the advantage that the length of each bar is directly proportional to the duration of a task. Most project management software packages enable PERT or CPM networks to be printed as Gantt charts. Gantt charts and networks are not alternatives, they complement one another. They are used together to plan, schedule and control projects.

Reading


This reading helps you achieve Objectives 9 and 10 of this unit.
Project management software: MS-Project®

Project management software has become a requirement in any information systems development effort today. Project management software is but one type of CASE tool that is used throughout the life cycle planning and development of an IS. The techniques that you have learned in the previous sections on Gantt and PERT charts are implemented using project management tools.

Though there exists a number of software packages for project management, Project has been chosen as a representative example. The popularity of MS-Project® and the fact that it can be purchased through educational channels at academic pricing makes it an ideal choice for student use.

MS-Project® provides a number of views to your project. It has views for Gantt chart, PERT chart, calendar and resource allocation, to name a few. These graphical views are dependency related — so changes to information within one view will reflect in other views. See Figures 3.3 - 3.6 for examples.

Figure 3.3  Example of Gantt chart in MS-Project®
Figure 3.4  Example of PERT chart with critical path in MS-Project®

Figure 3.5  Example of Calendar view in MS-Project®
MS-Project® operates very much like a spreadsheet program. You can define tasks in each line of the task field and relevant information such as duration, start time, finish time, and task dependencies. Other inputs into MS-Project® can include the following:

- Multiple projects and tasks
- Resource requirements (labour, money and equipment) and allocation assignments per task
- Cost assignment per unit of resource

Afterwards, project management charts will be generated based upon the inputs. The chart can then be printed out or published on a project intranet site for group support.

These Gantt and PERT charts are expected to continually change, typically daily for short-term projects. We can expect delays, accelerated efforts, new tasks, additional resources, etc. to vary throughout the life cycle. Frequent update and analysis of the project information can serve to help the project manager to identify problem areas that need to be addressed in a timely manner. Thus software such as MS-Project® have become indispensable in managing IS development projects.

Beyond making simple Gantt and PERT charts, project management software packages have become more sophisticated in their capabilities.

**MS-Project® features/capabilities**

Consider the following capabilities found in this version of MS-Project®:

- critical path analysis
- wide selection of model templates for projects
• spell-checking capability
• third party add-on support, such as risk-analysis modules
• multi-project capability (to 80 projects)
• resource allocation
• support for 10,000 tasks per project
• support for workgroups
• publication of charts and data on internet/intranets
• cost tracking
• resource loading and levelling
• variety of graphs and reporting capability
• integration with other software such as MS-Office
• tutorial and advanced help system

As you can see, MS-Project®, like some other similar project management products, provide a rich set of features that go beyond just preparation of Gantt charts and determining critical paths. In reality, there are many calculable factors beyond just estimation of task times that are important for the overall management of an IS project. As such, project management software will continue to expand to support such needs from users.

Activity

Make a visit to the Microsoft homepage (http://www.microsoft.com) and navigate down to their MS-Project® web-pages. Review the capabilities of their latest release. This will give you a perspective on the trends and capabilities of project management tools. Additionally, on their site, they may periodically release ‘evaluation’ versions that you can download to try. In particular, you may wish to run their tutorial to get a feel for its capability and ease-of-use.
Portfolio management

Any organization with a mature information systems department has many computer-based information systems: e.g., accounts payable, accounts receivable, general ledger, order handling, inventory control. This set of systems is known as a ‘portfolio’. Portfolio management refers to the selection of an IS development portfolio taking into account risks inherent in projects.

Before a new system is born, it must be conceived. Ideas for new systems are usually expressed in a ‘project proposal’. Senior management may receive many project proposals. It selects one or more of these for further investigation. This selection takes account of the current portfolio (What systems are already in place? What is missing?) and the risks associated with each proposal.

Project proposals

Project proposals or requests can come from many sources. They may be raised as a result of pressures on an organization, exerted externally or internally. External pressures include government regulations, industry requirements and competitors’ activities. All of these may necessitate systems development. Internal pressures include management policies or strategies, user-identified problems or opportunities and responses to new technology. Senior management or users may recognize an opportunity to serve new markets or to add new services. Users may identify deficiencies in an existing system as it currently operates or in anticipation of future growth. Whatever the reason, a project proposal is generated, requesting development of a new system or modification to an existing one.

Risk analysis

Some projects are more risky than others. Risk analysis attempts to identify risks associated with a project so that they can be reduced and controlled. Risk is concerned with future events where outcomes are in doubt. It is related to the probability that an outcome will not be achieved (e.g., risk associated with project duration is related to the probability that a project will not meet its due date). However, risk analysis is not simply about probability. The loss associated with a particular risk is also important (e.g., if being late incurs only a small cost, then a project is low risk; if being late incurs a high additional cost, then a project is high risk). Risk is not usually measured absolutely, but relative to other project proposals, using a Risk Assessment Questionnaire (RAQ). An RAQ addresses specific attributes of a project that have been determined to contribute to risk. Each attribute is assigned a weight in proportion to its importance as a predictor of risk. Attributes and weights vary from organization to organization.

Cash et al. (1992) provide a useful RAQ. They also identify the following three major project dimensions that influence risk:

- [RAQ dimension 1]
- [RAQ dimension 2]
- [RAQ dimension 3]
**Project size.** In general, larger projects are riskier than smaller ones. Related to this factor is the size of an IT department: a small project in a large company may be a large project in a small company.

**Project structure.** The more structured a project, the less risky it is to manage it. Less structured projects are usually riskier than structured ones because of the ambiguity related to the scope of the project and user expectation.

**Experience with technology.** Familiarity with certain hardware and software technology reduces the risk of a project that is based on those technologies. Imagine you, as a Unix programmer, are asked to develop a system in the MS-Windows® environment. It is not difficult to see that such development project will be riskier than the one developed in the Unix environment.

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**Self-test**

**MATCHING**

Match the following definitions:

A  Reverse scheduling
B  Forward scheduling
C  Work breakdown structure
D  Milestones
E  Calendar

1  Every business operates on this
2  Events that signify major accomplishments or events during a project
3  Establishes a project start date and then schedules forward from that date
4  Establishes a project deadline and then schedules backward from that date
5  A hierarchical decomposition of the project into phases, activities, and tasks

1  Explain the four functions of project management.
2  Define the tasks and products of project planning and scheduling.
3  Draw a work breakdown structure for an SDLC detailing the activities to be done in each phase.
4  What are the purposes of estimating at different stages of a systems development project?
5 What are the purposes of project control?
6 What are the major tasks involved in project control?
7 What are the causes of project failure?
8 What is meant by portfolio management?
9 What is process management?
10 What are some of the inputs to project management software such as MS-Project®?
11 What can project management software such as MS-Project® do for you?
Summary

Project management is an integral part of systems development. It involves planning, estimating, scheduling and controlling a systems development project. Project management is usually separated from direct development activities such as analysis and design. It is often the responsibility of a senior developer, a project leader or project manager.

Planning, estimating and scheduling are iterative activities. You usually carry them out prior to a project or project phase commencing. Network analysis and Gantt charts are tools used in planning and scheduling.

Controlling requires comparing actual performance with planned performance, as a project progresses. When necessary, corrective action is required to return performance to plan or to change the plan.

In this unit you were also introduced to project management techniques. These techniques do not contribute directly to the production of a system, but are absolutely essential to the success of a system development. You focused on techniques that ensure that a system is developed efficiently and effectively.

In the next unit of this course, Unit 4, you will explore concepts related to systems analysis.
References


Glossary

This glossary provides brief definitions of the main technical terms you encountered in Unit 3. The definitions given here are offered in addition to, or in place of those found in your textbook.

**Feature creep:** The uncontrolled addition of technical features to a system under development without regard to schedule and budget.

**Milestones:** Events that signify major accomplishments or events during a project.

**MS-Project:** A project management software that is routinely used to help project managers plan projects, develop schedules, develop budgets, monitor progress and costs, generate management reports and effect change.

**Mythical man-month:** The idea is that as a project falls behind schedule, the project manager usually tries to allocate more personnel to accelerate the rate of progress. But because extra effort is required to co-ordinate the activities of the additional personnel, the law of diminishing return presents itself, delaying the project even further.

**Portfolio management:** The selection of an IS development portfolio taking into account risks inherent in projects.

**Process management:** The planning, selection, deployment and consistent application of standard system development methods, tools, techniques and technologies to all information system projects.

**Project:** A sequence of unique, complex and connected activities having one goal or purpose and is finite.

**Project structure:** This is the initial understanding of user requirements. High structure refers to good understanding and low structure refers to limited understanding.

**Project control:** Management of the co-ordinating development activities, monitoring progress and reviewing deliverables.

**Project estimation:** The approximation of the time, effort, costs and benefits of the project.

**Project management:** The process of defining, planning, directing, monitoring and controlling the development of an acceptable system at a minimum cost within a specified time frame.

**Project monitoring:** Management aspect of comparing actual progress to plan.

**Project planning:** Management aspect of identifying development activities and estimating their effort and duration.
Answer key for self-test questions

MATCHING

E 1 Every business operates on this

D 2 Events that signify major accomplishments or events during a project

B 3 Establishes a project start date and then schedules forward from that date

A 4 Establishes a project deadline and then schedules backward from that date

C 5 A hierarchical decomposition of the project into phases, activities, and tasks

1 Planning. Study and development of projected courses of action for meeting goals or dealing with anticipated problems.

Estimating. Process of predicting project variables such as effort, duration, cost and resources.

Scheduling. Relating project activities that must be completed in a time sequence.

Controlling. Coordinating development activities, monitoring progress and reviewing deliverables; requires comparing actual performance with planned performance, as a project progresses. When necessary, corrective action is required to return performance to plan or to change the plan.

2 Planning and scheduling involve:

• deciding a development strategy (i.e., determining which SDLC is appropriate for this application)
• establishing project milestones
• determining specific development activities and individual tasks that are required to complete a project (i.e., developing a work breakdown structure)
• estimating effort and duration required to complete each identified activity and task
• scheduling activities and tasks, allocating staff and resources to a development process
• producing planning documentation for a project.

Deliverables of planning and scheduling are written plans detailing what is to be done, when it is going to be done and who is going to do it.

3 The work breakdown structure (from your set textbook) is:

1 The Preliminary Investigation Phase
1.1 Survey problems and opportunities  
1.2 Negotiate project scope  
1.3 Plan the project  
1.4 Present the project  

2 The Problem Analysis Phase  
2.1 Model the current system  
2.2 Analyse the business processes  
2.3 Analyse problems and opportunities  
2.4 Establish system improvement objectives  
2.5 Modify project and scope plan  
2.6 Present the project  
2.7 Problem statement  

3 The Requirements Analysis Phase  
3.1 Outline business requirements  
3.2 Model business system requirements  
3.3 Build prototypes  
3.4 Prioritize business requirements  
3.5 Modify project plan and scope  
3.6 Requirements statement  

4 The Decision Analysis Phase  
4.1 Define candidate solutions  
4.2 Analyse feasibility of candidate solutions  
4.3 Recommend a system solution  
4.4 System recommendation  

5 The Design Phase  
5.1 Analyse and distribute data  
5.2 Analyse and distribute processes  
5.3 Design database  
5.4 Design outputs and inputs  
5.5 Baseline design  
5.6 Design online user interface  
5.7 Present and review design  

6 The Construction Phase  
6.1 Construct the databases  
6.2 Construct the inputs  
6.3 Construct the outputs
6.4 Construct the user interface
6.5 Write and unit test programs
6.6 Version sign-off

7 The Implementation Phase
7.1 Install the system test version
7.2 Conduct the system test
7.3 Train users
7.4 Conduct the production test
7.5 Deploy the system
7.6 Operational system

4 Purposes of estimating at different stages of development are:
  • The Preliminary Investigation Phase, Initial Investigation — broad estimates of effort, cost and duration to establish feasibility of a project.
  • The Problem Analysis Phase, Feasibility Study — approximate estimates of effort, cost and duration to enable management to decide whether or not to commit resources to the project.
  • The Problem Analysis Phase, Existing System Review — detailed estimates of effort and duration to enable information systems management to control the later phases.
  • The Requirements Analysis Phase, Build Discovery Prototypes — confirmation of cost and duration estimates to enable management to decide whether or not to commit resources to the later phases.
  • The Decision Analysis Phase, Implementation and Installation Planning — detailed estimates of effort and duration to enable information systems management to control the later phases.
  • The Implementation Phase, Test Specifications and Planning — detailed estimates of effort and duration to enable information systems management to control testing and installation.

5 The purpose of project control is to ensure that the objectives of a project are actually met. It will answer the following questions: Will a system meet predefined requirements? Will a system be delivered within budget? Will a system be delivered within schedule?

6 The tasks involved in project control are:
  • Project tracking involves collecting data on actual progress.
  • Project monitoring involves comparing actual progress to plan.
  • Project reporting involves preparing periodic reports, usually monthly, on the progress of a project.
  • Change control is a standardized approach to handling changes to a project.
7 The reasons of project failure are as follows:

• Many systems analysts and information technologists are unfamiliar with or undisciplined in using the tools and techniques of systems analysis and design.
• Poor leadership and people management.
• Taking shortcuts around or through the methodology because the project is behind schedule, the cost exceeds the authorized budget, and/or team members are not trained and skilled in some of the activities and requirements.
• Poor expectations management that leads to scope creep and feature creep. Scope creep is the unexpected growth of user expectations and business requirements for an information system as the project progresses. Feature creep is the uncontrolled addition of technical features to a system under development without regard to schedule and budget.
• Poor estimation techniques so that cost overruns and schedules are delayed.
• The business is in a constant state of change, such that a project becomes incompatible with the new user expectations and business requirements.

8 A portfolio is a set of computer-based information systems such as accounts payable, general ledger, order handling and inventory control within an organization. In order to survive in the competitive and fast-changing world, the current portfolio has to be constantly updated. Therefore, senior management needs to review project proposals and make decisions on systems development by taking the current portfolio and risks into account. In short, portfolio management is the selection of an IS development portfolio taking into account risks inherent in projects.

9 Process management is an ongoing activity that establishes standards for activities, methods, tools and deliverables of the life cycle. It is also the planning, selection, deployment and consistent application of standard system development methods, tools, techniques and technologies to all information systems projects.

10 Typical inputs into the system are:

• Project and task definition
• Project/task duration, start times and finish times
• Task dependencies (e.g., which tasks must be done before others can be started)
• Resource allocation (e.g., personnel, money and equipment)
• Cost values per unit of resource

11 Project management software such as MS-Project® can help me define the projects and identify individual tasks for each project. In addition, information such as task dependencies, time values (duration, start and end times) and resource becomes a real boost in productivity from the ability to make frequent updates of information and generate new charts and graphs instantly.
Unit 3

Project and process management and MS-Project
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