

Tools and Analysis

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Cost Classifications

- Costs can be classified as tangible or intangible, direct or indirect, fixed or variable, and developmental or operational.

Cost Classifications

- **Tangible Costs** are costs for which you can assign a specific dollar value.
- **Intangible Costs** are costs whose dollar value cannot be calculated easily.
- **Direct Costs** are costs that can be associated with the development of a specific system.
- **Indirect Costs, or Overhead Expenses**, cannot be attributed to the development of a particular information system.

Cost Classifications

- **Fixed Costs** are costs that are relatively constant and do not depend on a level of activity or effort.
- **Variable Costs** are costs that vary depending on the level of activity.
- **Developmental Costs** are incurred only once at the time the system is developed or acquire.
- **Operational Costs** are incurred after the system is implemented and continue while the system is in use.

Benefit Classifications

- In addition to classifying costs, you must classify the benefits that the company expects from a project.
- Benefits can be classified as tangible or intangible, fixed or variable, and direct or indirect.
- Another useful benefit classification relates to the nature of the benefit: positive benefits versus cost-avoidance benefits.
- Cost-avoidance benefits are just as important as positive benefits, and you must consider both types when performing cost-benefits analysis.

Nature of Benefits

- Positive Benefits
 - ◆ Increase revenues, improve services, or otherwise contribute to the organization as a direct result of the new information system.
- Cost-avoidance Benefits
 - ◆ Refer to expenses that would be necessary if the new system is not installed.

Cost-Benefits Analysis

- Cost-benefits analysis is the process of comparing the anticipated costs of an information system to the anticipated benefits.
- Cost-benefit analysis is performed throughout the SDLC to determine the economic feasibility of an information system project and to compare alternative solutions.

Three Common Cost-Benefits Analysis Methods

- Payback analysis
- Return on investment analysis
- Present value analysis.

Payback Analysis

- Payback analysis is the process of determining how long it takes an information system to pay for itself.
- The time it takes to recover the system's cost is called the payback period.

Step for Payback Analysis

1. Determine the initial development cost of the system.
2. Estimate annual benefits.
3. Determine annual operating costs.
4. Find the payback period by comparing total development and operating costs to the accumulated value of the benefits produced by the system.

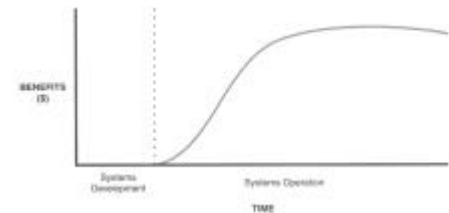
System Costs over the Potential Life of the System

- After the system is operational, costs decrease rapidly and remain relatively low for a period of time.
- As the system requires more maintenance, costs begin to increase.



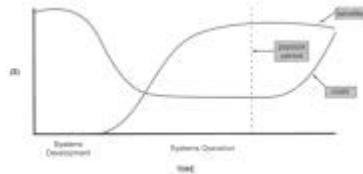
Benefits provided by an Information System against Time

- Benefits start to appear when the system becomes operational, might increase for a time, and then level off or begin to decline



Conducting a Payback Analysis

- Calculate the time it takes for the accumulated benefits of an information system to equal the accumulated costs of developing and operating the system.
- Payback period corresponds to the time at which the areas under the two curves are equal.



Read P.10-4

Return on Investment Analysis

- Return on investment (ROI) is a percentage rate that measures profitability by comparing, total net benefits (the return) received from a project to the total costs (the investment) of project.
- ROI is calculated as follows:
 - ◆ $ROI = (\text{total benefits} - \text{total costs}) / \text{total costs}$
- Read P.10-5

Present Value Analysis

- The Present Value of a future dollar is the amount of money that, when invested today at a specified interest rate, grows to exactly one dollar at a certain point in the future.
- The Specified Interest Rate is called the Discount Rate.

Steps for Present Value Analysis

1. Multiply each of the projected benefits and costs by the proper present value factor
2. Sum all the time-adjusted benefits and time-adjusted costs.
3. Calculate the net present value (NPV) of the project:
 - ◆ Total present value of benefits minus the total present value of the costs.

Project Management Tools

- Project management is the process of defining, planning, organizing, leading, and controlling the development of an information system.
- Project management is important throughout the entire SDLC.

Developing Time and Cost Estimates

- Programming activities represent a significant part of the project, it is important to estimate the time required for those tasks and develop a budget.
- Project managers must consider four main factors:
 - ◆ Project Size And Scope
 - ◆ IT Resources
 - ◆ Prior Experience
 - ◆ Constraints

Considered Factors

- Project Size And Scope
 - ◆ To develop accurate time estimates, you must identify all project activities and tasks, from initial fact-finding to application development.
- IT Resources
 - ◆ In many areas, skilled IT professionals are in great demand, and firms must work hard to attract and retain the talent they need.

Considered Factors

- Prior Experience
 - ◆ Develop time and cost estimates based on the resources used for similar, previously developed information systems.
- Constraints
 - ◆ Given those limitations, the project manager must define the system requirements that can be achieved realistically within the required constraints.

Project Scheduling

- When project scheduling, the project manager must know:
 - ◆ Duration of each activity.
 - ◆ Order of which the activities will be performed.
 - ◆ Start and end times for each activity
 - ◆ Who will be assigned to each specific task.
 - ◆ Tasks that are dependent on other activities.
- Several graphical planning aids can help a project manager in the scheduling process:
 - ◆ Gantt charts
 - ◆ PERT/CPM charts

Gantt Charts

- A Gantt chart is a horizontal bar chart that illustrates a schedule.
- In the Gantt chart the analyst displays time on the horizontal axis and arranges the activities vertically, from top to bottom, in the order of their start dates.
- The horizontal position of the bar shows the start and end of the activity, and the length of the bar indicates its duration.

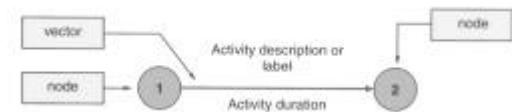
ID	Task Name	Duration	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1	Planning	2w	1/26	2/6						
2	Analysis	12w	2/9				5/1			
3	Design	12w			3/23				6/12	
4	Implementation	5w					6/15			8/7

PERT/CPM

- A PERT/CPM chart shows a project as a network diagram.
- The activities are shown as **Vectors**, and the events are displayed graphically as **Nodes**.

PERT/CPM

- Each event is identified by a number - event 1 is the beginning of the activity, and event 2 marks the end.
- Each activity is identified by a short description above the vector, or with a letter or code explained in a table.



Dummy Activities

- A dummy activity indicates an event dependency, but does not require any resources or completion time.



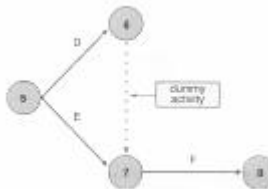
Dependent / Serial Activities

- When tasks must be completed in sequence, they are called dependent, or serial activities.
- Activity A must end before activity B can begin. Event 3, which marks the end of activity B, must occur before activity C can start.

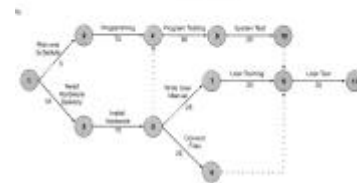
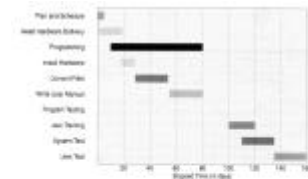


Concurrent / Parallel Activities

- When activities can be completed at the same time, they are called concurrent, or parallel activities.
- Activities D and E are parallel activities that can be done at the same time, but the length of the two tasks may be different.



Example



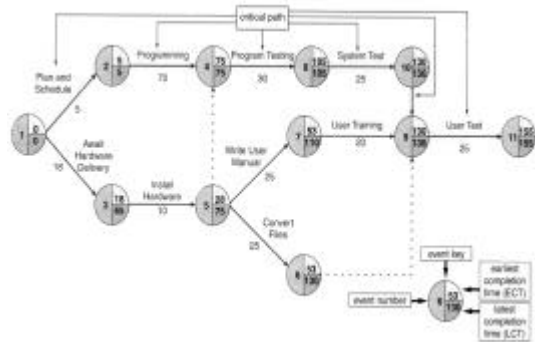
Example

- After identifying the tasks and durations, the project manager determines the overall length of the project.
- Determine the earliest completion time (ECT) for each event, which is the minimum amount of time necessary to complete all the activities that precede the event..
- Determine the latest completion time (LCT) for an event, which is the latest time at which the event can occur without delaying the project.

Example

- At least one complete path will exist through a PERT/CPM network for which every node has equal ECTs and LCTS. That path is called the critical.
- A critical path is a series of events and activities with no slack time.

Example



Gantt Charts vs. PERT/CPM

- PERT/CPM charts differ from Gantt charts in two aspects:
 - ◆ A PERT/CPM chart for even a small project can be rather complicated, and the degree of complexity increases significantly for larger projects.
 - ◆ The picture presented by a PERT/CPM chart is not as clear as a Gantt chart, which graphically displays the timing and duration of the activities.
- PERT/CPM and Gantt charts are not mutually exclusive techniques. Project managers often use both methods.

Project Monitoring and Controlling

- A project must be planned, organized, and scheduled before the work actually starts. After the project activities begin, the project manager concentrates on monitoring and controlling the project.
- To help ensure that quality standards are met, many project managers institute structured walkthroughs.
- A structured walkthrough is a review of a project team member's work by other members of the team.

Project Reporting

- Project Status Meetings
 - ◆ Most project managers schedule regular status meetings with the entire project team. At those meetings, each team member updates the group and identifies any problems or delays.
- Project Status Reports
 - ◆ A project manager must report regularly to his or her immediate supervisor, upper management, and users. Gantt charts often are included in progress reports to show project status graphically.

Project Management Software

- Project management software can assist you in project planning, estimating, scheduling, monitoring, and reporting.
- Powerful project management packages offer many features, including:
 - ◆ PERT/CPM
 - ◆ Gantt charts
 - ◆ Resource scheduling
 - ◆ Project calendars
 - ◆ Cost tracking, and
 - ◆ Cost-benefit analysis.
- Example of a popular project management software is Microsoft Project.

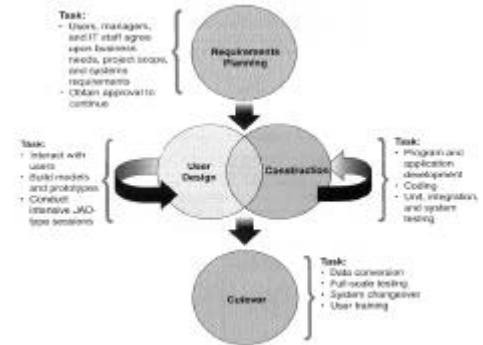
Alternative System Development Tools

- In addition to understanding structured analysis and 0-0 methodologies, systems analysts should know about two other systems development strategies: Rapid Application Development (RAD) and Microsoft Solutions Framework (MSF).

Rapid Application Development

- Rapid application development (RAD) is a team-based technique that speeds up information systems development and produces a functioning information system.
- RAD is a complete methodology, with a four-phase life cycle that parallels the traditional SDLC phases.
- The end product of RAD is the new information system.

RAD Phases and Activities



Requirements Planning

- The requirements planning phase combines elements of the systems planning and systems analysis phases of the SDLC.
- The requirements planning phase ends when the team agrees on the key issues and obtains management authorization to continue.

User Design

- During the user design phase, users interact with systems analysts and develop models and prototypes that represent all system processes, outputs, and inputs.
- Typically use a combination of JAD techniques and CASE tools to translate user needs into working models.
- User design is a continuous, interactive process that allows users to understand, modify, and eventually approve a working model of the system that meets their needs.

Construction

- The construction phase focuses on program and application development tasks similar to the SDLC.
- In RAD, however, users continue to participate and can still suggest changes or improvements as actual screens or reports are developed.

Cutover

- The cutover phase resembles the final tasks in the SDLC implementation phase, including data conversion, testing, changeover to the new system, and user training.
- Compared with traditional methods, the entire process is compressed.
- As a result, the new system is built, delivered, and placed in operation much sooner.

Overview of Microsoft Solutions Framework (MSF)

- The objective is to define and analyze business requirements and provide IT solutions.

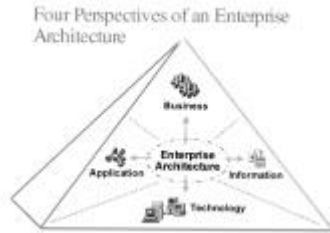


Microsoft Solutions Framework

- Microsoft Solutions Framework is the plan and build phase of the Enterprise Services Framework, which is Microsoft's version of a systems development life cycle.
- Microsoft Solutions Framework is only one component of the Enterprise Services Framework, which is an overall model of how to prepare, plan, build, and manage information systems.

Four Perspectives

- Microsoft looks at a system from four separate perspectives, but interdependent viewpoints:
 - ◆ Business
 - ◆ Applications
 - ◆ Information
 - ◆ Technology



Microsoft Solutions Framework

- Microsoft developed Microsoft Solutions Framework by documenting the experience of its own IT teams in analyzing information system requirements and creating solution architectures.
- Microsoft Solutions Framework includes a series of models to build:
 - ◆ A Risk Management Model
 - ◆ A Team Model
 - ◆ A Process Model

Microsoft Solution Framework Model

- Each model has a specific purpose and contributes to the overall design and implementation of the system.
- A set of Microsoft Solutions Framework models taken together describes an information system and provides an overall systems development methodology.