



Param Pujya Dr. Babasaheb Ambedkar Smarak Samiti's

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Unit II

Risk identification

Programme Educational Objectives

Our program will create graduates who:

- 1. Will be recognized as a creative and an enterprising team leader.*
- 2. Will be a flexible, adaptable and an ethical individual.*
- 3. Will have a holistic approach to problem solving in the dynamic business environment.*

Project Management Course Outcomes

- CO1-Given a project example (construction, organizing event), student manager will be able to construct and explain project life cycle of the project.
- CO2-Given a construction project example, the student manager will be able to identify the probable risks in the project and explain the steps of risk response planning process of the project.
- CO3-Given the time duration and cost estimates for various activities in a project, the student manager will be able to construct a Gantt chart of the project.

CO4- Given a condition (Early project delivery, project delay, shifting to new project, cost escalation), the student manager will be able to identify the reason for fast tracking the project and explain the process of fast tracking that project.

CO5- Given an organizational project example, the Student manager will be able to select and explain the type of project organization structure of a given project.

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Managerial Economics Course Outcomes

- CO1-Given the changes in the price of a commodity, substitute or complementary goods and services, consumers' income in addition to the changes in quantity demanded, the student manager will be able to establish the interrelationship between the independent variable and demand that would aid in decision making.
- CO2-Given a set of historical & current demand data the student manager will be able to estimate future demand for goods and services using survey and statistical techniques (such as Consumer survey, Sales force opinion, Expert opinion and Delphi technique; times series analysis and regression technique).
- CO3-Given the scale of inputs in a production scenario, the student manager will be able to comment on the output and categorize the reasons for economies and diseconomies of scale.

- CO4-Given the structural details of a market (Monopoly, Oligopoly, Monopolistic competition and Perfect competition) the student manager will be able to determine the price and output for a given market structure.
- CO5-Given the components of national income, the student managers will be able to ascertain the GDP, GNP, NDP & NNP at factor cost and market prices using the product, income and expenditure method and vice-versa.
- CO6-Given the components of monetary and fiscal policy, the student manager will be able to explain the impact of the same on the business activities.

Risk identification

- Identifying the risks
- Predicting their consequence

Managers attitude

- Risk averse
- Risk takers

Risk in project typically stems from..

- Using an unusual approach
- Attempting to further technology
- Training for new tasks
- Developing and testing of new skills

Sources of risks

- Market risks
- Technical risks
- Government regulations
- Market conditions
- Suppliers relations
- Weather

Identification techniques

- Analogy
- Checklist
- WBS analysis
- Process flow charts
- brainstorming



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Unit II

Risk assessment

Risk Likelihood

Risk assessment

- Risk likelihood
- It is the probability that a hazard or risk factor will actually materialize.
- It can be expressed as a numerical value between 1.0 (certain to happen) and 0(impossible)
- Qualitative ratings such as high, medium, or low.

Risk likelihood

Table 10.2 Risk Likelihood: Qualitative Ratings for Quantitative Values

QUALITATIVE	NUMERICAL
Low	0–0.20
Medium	0.21–0.50
High	0.51–1.00

Composite likelihood factor (CLF)

Table 10.3 Sources of Failure and Likelihood*

LIKELIHOOD	M_H	M_S	C_H	C_S	D
0.1 (Low)	Existing	Existing	Simple design	Simple design	Independent
0.3 (Minor)	Minor redesign	Minor redesign	Minor complexity	Minor complexity	Schedule dependent on existing system
0.5 (Moderate)	Major change feasible	Major change feasible	Moderate complexity	Moderate	Performance dependent on existing system
0.7 (Significant)	Complex design; technology exists	New, but similar to existing software	Significant complexity	Significant complexity	Schedule dependent on new system
0.9 (High)	State of the art; some research done	State of the art; never done	Extreme complexity	Extreme complexity	Performance dependent on new system

Contd....

- **MS**, failure likelihood due to immaturity of software;
- **CS**, failure likelihood due to complexity of software;
- **MH**, failure likelihood due to immaturity of hardware;
- **CH**, failure likelihood due to complexity of hardware;
- **D**, failure likelihood due to dependency on external factors.



Unit II

Risk assessment

Risk Impact



RISK IMPACT

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Risk impact

- Risk impact in projects is specified in terms of...
- Time
- Cost
- Performance measures

Risk impact

- Quantitative and qualitative rating
- Composite impact factor
- Recover

Risk consequence

- There are two ways of expressing risk consequence....
- Numerical ratings
- Expected value



Unit II

Risk Response Planning

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Risk response planning

- Risk response planning addresses the matter of how to deal with risk.
- Once risks are identified.
- And it is assessed with data.

Transfer the risks

- Risks can be transferred partly or fully from the customer to the contractor.
- Tools used are...
- Contractual incentives
- Warranties
- Penalties attached to the projects.

Avoid risks

- Altering the original project concept
- Eliminating risky activities
- Minimizing system complexity

Reduce risks

- Employ the best technical team
- Use computer assisted tools
- Provide the technical team
- Hire outside technical team
- Perform extensive tests
- Minimize system complexity
- Design margin application



Unit II

Cost Estimating

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Introduction

- When the cost of the work package can not be estimated because it is too complex, the work package is broken down further until it can.
- When the cost can not be estimated because of uncertainties about the work, the estimate is initially based upon opinions and judgement, and is then refined as information becomes available.

Contd....

- It is necessary in projects to **put practical constraints on cost** so that realistic budgets can be established..
- **Failing to do so** results in **projects that are prematurely terminated for lack of funds, or are completed but at exorbitant expense.**
- Cost estimating sometimes are thought to be the exclusive concerns of project planners and accountants, but in project they should be concern of everyone.

Cost escalation

The amount by which actual costs grow to exceed initial estimates is referred to as cost escalation.

Cost escalation projects

- The **Concorde supersonic airliner** exceeded the original estimate by a factor of five,
- **Nuclear power plants** often exceed estimates by a factor of two or three, and
- **NASA spacecraft** often exceed estimates by a factor of
- four to five.

HOW UNCERTAINTY BEHAVES

- **For example**, suppose we estimate **“Paint Bedroom”** at **3 days**, with an uncertainty factor of 2.
- **The most likely case is 3 days.**
- **The best case is 1.5 days**, which is 1.5 days under the estimate.
- **The worst case is 6 days**, which is 3 days over the estimate.

Changes in Requirements or Design

- Cost escalation also occurs due to discretionary, non-essential changes to system requirements and plans.
- These changes come from a change in mind, not from oversights, mistakes, or environmental mandates that would make them imperative.
- The routine tendency is for users and contractors alike to want to modify systems and procedures—to make “improvements” to original plans throughout the project life cycle.

Contd....

- Any change, however, no matter how small, causes escalation;
- **it usually involves a combination of**
 - redesign or reorganizing work,
 - acquiring new or different resources,
 - altering plans, and
 - undoing or scrapping earlier work.
- The further along the project is, the more costly the change.

Economic and Social Factors

- Even with good initial estimates and few changes, cost escalation occurs because of...
- social and economic forces beyond the contractor's or user's influence.
- Labor strikes,
- legal action by interest groups,
- trade embargoes, and
- materials shortages
- Inflation and exchange rate
- all serve to stifle progress and increase costs,

Project Contract types

The two basic kinds of contracts:

fixed price and
cost-plus.

Bias and Ambition

- ⦿ It is human nature for the champions of projects to be optimistic about their projects.
- ⦿ That optimism, however, can lead to overestimating benefits and underestimating costs.
- ⦿ Promoters of big projects know that if a project is important enough, sufficient funding to complete it will materialize, no matter the size of the overrun.

Cost estimating process

- Classifying work tasks and costs
- Expert opinion
- Analogy estimate
- Parametric estimate
- Cost engineering
- Contingency amount

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Unit II

Budget Estimates

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Elements of budget and estimates

- Direct labour expenses
- Direct non labour expenses
- Overhead, General and administrative expenses
- Profit Total billing

Direct Labor Expenses

- *Direct labor* expense is the labor charge for the project.
- For each task or work package, an estimate is made of the number of people needed in each labor grade, and the number of hours or days for each.
- This gives the distribution of labor hours or days required per labor grade.

Typical 6-month budget for a work package.

Project <u>CASTLE</u>		Date <u>April 1, 1592</u>							
Department <u>Excavating</u>		Work package <u>Moat</u>							
Charge	Rate	Months ⁺						Totals	
		1	2	3	4	5	6	Hours	Cost
Direct labor									
Professional	\$35/hour	50				50		100	3,500
Associate	\$30/hour		100	100	100	100		400	8,000
Assistant	\$20/hour								
Direct labor cost		1,750	2,000	2,000	2,000	3,750			11,500
Labor overhead	75%	1,312	1,500	1,500	1,500	2,813			8,625
Other direct cost*			100						100
Total direct cost		3,062	3,600	3,500	3,500	6,563			20,225
General/administrative	10%	306	360	350	350	657			2,023
Total costs		3,368	3,960	3,850	3,850	7,220			22,248
Profit	15%								
Billing total									

⁺ Should extend for as many months as required by the project.

*Should be itemized to include costs for materials, freight, subcontracts, travel, and all other nonlabor direct costs.

Direct Non-Labor Expense

- *Direct non-labor* expense is the total expense of non-labor charges applied directly to the task.
- **It includes**
- subcontractors,
- consultants,
- travel,
- telephone calls,
- computer
- time, material costs, purchased parts, and freight.

Contd....

- **Direct non-labor expenses also include**
- necessities for installation and operation,
- such as instruction and maintenance manuals,
- engineering and programming documentation,
- drawings, and
- spare parts.

PROJECT COST ACCOUNTING SYSTEMS

- To expedite the process, reduce confusion, and improve accuracy, you need another system;
- in particular, one to help compute estimates, create, store and process budgets, and track costs.
- Such a system, called a *project cost accounting system (PCAS)*, is initially set up by the project manager, project accountant or PMO.

Contd...

- While the main focus of the PCAS is on project costs,
- the system also assists tracking and controlling schedules and work progress.
-
- When a PCAS is combined with other project planning, control, and reporting functions, the whole system is referred to as the *project management information system (PMIS)*.

PROJECT MANAGEMENT INFORMATION SYSTEMS

A *system*—for collecting, organizing, storing, processing, and disseminating that information.

Such a framework or tool is the *PMIS*—*project management information system*.

Features of PMIS Software

- Scheduling and network planning
- Resource management
- Budgeting
- Managing multiple projects and project portfolios
- Cost control and performance analysis
- Reporting, graphics, and communication
- Interface, flexibility, and ease of use

Web-Enabled Project Management

- Web-enabled technology is well suited for situations where the project team and stakeholders are situated at different sites.
- Putting information on a project website or other network utilizing the Internet affords the benefits of immediate information availability, rapid and easy communication between workers, and information that is reliable and current because it is communicated in real time.

Group Productivity

- With an intranet, it is easy to access *group productivity software* and to store reports, profiles, calendars, and schedules.
- It is also easy for users to locate information in these documents using special *document-sharing tools*, such as newsgroups, chat rooms, and electronic whiteboards.
- These tools are especially useful for sharing pictorial information about product design requirements and descriptions.

Contd...

- **E-mail** is another important communication tool, although experienced project managers advise it is no substitute for face-to-face or telephone meetings.
- Other means for collectively sharing information on-line include **discussion forums** and **chat rooms**.
- Members of a discussion forum can view others' contributions and add comments.
- Chat rooms are similar to e-mail and discussion forums, but permit immediate response by participants to incoming messages.



Unit II

Project Controls

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Author Daniel Roman defines the project control process as:

- Assessing actual against planned technical accomplishment,
- Reviewing and verifying the validity of technical objectives,
- Confirming the continued need for the project,
- Timing it to coincide with operational requirements,
- Overseeing resource expenditures, and
- Comparing the anticipated value with the costs incurred.

The control process can be.....

- (1) set the performance standards,
- (2) compare these standards with actual performance, and
- (3) take necessary corrective action.
- (4) report actions to all relevant stakeholders.

Set Performance Standards

- It happens **during the definition phase.**
- These standards include
- user requirements,
- technical specifications,
- budgeted costs,
- schedules, and
- resource requirements set in the project plan.

Actual Project Performance

- Compare the standards with *actual project performance*,
- Happens during the execution phase.
- Budgets,
- schedules, and
- performance specifications are
- *compared to*
- actual expenditures,
- test results,
- work completed, and other measures of project performance.

Corrective Action

- *It happens whenever actual performance significantly differs from planned performance.*
- Either the work is altered or expedited to achieve the planned results, or
- the plan is revised.
- *If the original plan proves unrealistic,*
- then the contractor must work with the customer to change the objectives and,
- accordingly, revise the requirements and modify the project plan.

Project control process

- Work Authorization
- Collecting Cost, Schedule, and Work Progress Data

Work Authorization

- A part of the control process is *work authorization* or start–stop control, **which means that** all work is started only after formal authorization and stopped only upon review and acceptance.
- **On large projects, authorization is subdivided** into the stages of
 - *contract release,*
 - *project release, and*
 - *work order release or work requisition.*

Contract release

- After the customer gives the okay and awards the contract, the contract administrator prepares a *contract release* document that specifies the contractual requirements and gives the project manager the go-ahead.
- The comptroller or project accountant then prepares a *project release* document, which authorizes project funding.

PROJECT CONTROL EMPHASIS

- Scope Control
- Quality Control
- Schedule Control
- Procurement Control
- Cost Control

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Unit II

Contract Administration And Procurement

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Contract administration

- Contract administration involves all activities related to the monitoring of suppliers, contractors and service providers' performance in the fulfillment of their contractual obligations, and to ensure appropriate actions are taken to promptly remedy any deficiencies observed in contract implementation, scope or terms and conditions.

Preparing for Contract Administration

- In addition to the contract, there are three other inputs to contract administration:
- Work results
- Change requests
- Seller invoices

CA ends

- The correct quantity has been received,
- The goods, works or services meet the technical standards defined in the contract,
- Any variations to the contract are well documented and accounted for,
- The goods, works or services have been delivered or completed on time, or that any delay has been noted and appropriate actions taken as indicated in the contract, and
- All required manuals or documentation have been received.

Procurement plan

- It includes..
- The types of contracts you plan to use and any metrics that will be used to measure the contractors' performance
- The planned delivery dates for the work or products you are contracting
- The company's standard documents you will use
- The number of vendors or contractors involved and how they will be managed
- How purchasing may impact the constraints and assumptions of the project plan
- The coordination of purchasing lead times with the development of the project schedule
- The identification of prequalified sellers (if known)

Contd...

- Make or buy analysis.
- It could also mean deciding whether to build a solution to your problem or buy one that is already available.