



# Project Management Introduction and Overview

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# Acknowledgements

- ❖ This material is for teaching purposes only. Not to be distributed without explicit permission of the author.
- ❖ All the material is prepared from the following sources.
  1. C F Gray, E W Larson and G V Desai, “Project Management, The Managerial Process”, Tata McGraw Hill, 2010
  2. S J Mantel, Jr., J R Meredith, S M Shafer, M M Sutton with M R Gopalan, “Project Management Core Text Book” John Wiley India, 2011

3. PPT slides from the Project Management Course at Edmund T. Pratt, Jr. School of Engineering at Duke University, USA.
4. Project Management in Practice, A short note by V. Srinivasa Rao.
5. Project Management Body of Knowledge (PMBOK) Guide Fourth Edition.
6. Personal thoughts, views, ideas and experience.
7. Project implementation status of Central Sector Projects, April – June 2009, MOPSI

## ❖ Modified Quote from Gray, Larson and Desai

➤ “Some of mankind’s greatest accomplishments – building the Taj Mahal, discovering a cure for polio, putting a man on the moon – began as a project.

## ❖ ISB conceived and built as a project

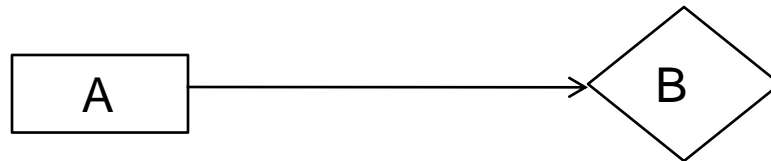
# Project

- ❖ “Temporary endeavor undertaken to create a “unique” product, service or result” (Project Management Institute)
  
- ❖ “Set of inter-related activities to achieve a particular goal or objective”

- ❖ Unique set of activities to achieve a defined outcome within a specified time frame using specific resources”.
- ❖ Characteristics
  - ✓ Not routine work
  - ✓ Objective with specifications that can be measured
  - ✓ Divided into interdependent tasks

- ✓ Life cycle with a specified due date
- ✓ Constraints on use of resources (People, money, equipments etc.)
- ✓ Budget
- ✓ Achieves a desired “unique” outcome or benefit
- ✓ Vehicle for implementing strategic plans
- ✓ Need for risk analysis and management

- ❖ Projects involve managing change for improvement
- ❖ Projects move organizations from state A to state B in a
  - Planned and Controlled way





# Project Management

- ❖ Application of knowledge, skills, tools and techniques to project activities to meet requirement
- ❖ Integrative approach
  - Integration of projects with strategic plan
  - Integration with the process of managing



# Importance of Project Management

## ❖ Business

- Projects define and redefine the business
- Businesses are built through series of projects that define
  - ✓ Physical infrastructure
  - ✓ Products and / or services that are sold
  - ✓ Processes for making a product or deliver a service

- Future projects are identified based on strategic needs to change or define the company.
- Assets in place :
  - ✓ Company may be viewed as portfolio of assets that have been built through various projects

➤ Growth in assets :

✓ Projects in progress and future projects identified / to be identified in accordance with strategic plan.

➤ Value of a company :

✓ Strongly depends upon the type of projects (past, present and future) and quality of execution of projects.

- ❖ Development of country
  - Infrastructure
    - ✓ Water
    - ✓ Power
    - ✓ Transport
    - ✓ Roads, Ports and Airport
  - Space Research
  - Research and Development
  - Poverty Alleviation Schemes

❖ Career as a certified Project Manager

❖ Project Management Institute

<http://www.pmi.org>

- Organization to promote project management
- Provide uniform set of knowledge (PMBOK)
- Certify competency in project management skills

## Some Surveys on Project Implementation...

CIO.com cites a Dynamic Markets survey of

800 IT managers –

➤ 62% of IT projects fail to meet their schedules.

➤ 49% suffered budget overruns

➤ 47% had higher-than-expected maintenance costs, and

➤ 41% failed to deliver the expected business value and ROI

**Source:** CNET News, 09/10/2012, 62 percent of IT Projects fail. Why?

**Refers to:** Why do IT projects fail, and is there anything we can do about it? - *by Matt Asay, March 21, 2008*

[http://advice.cio.com/remi/two reasons why it projects continue to fail](http://advice.cio.com/remi/two_reasons_why_it_projects_continue_to_fail)



# Some Surveys on Project Implementation...



Sector wise Implementation Status of Projects with reference to original and latest schedule

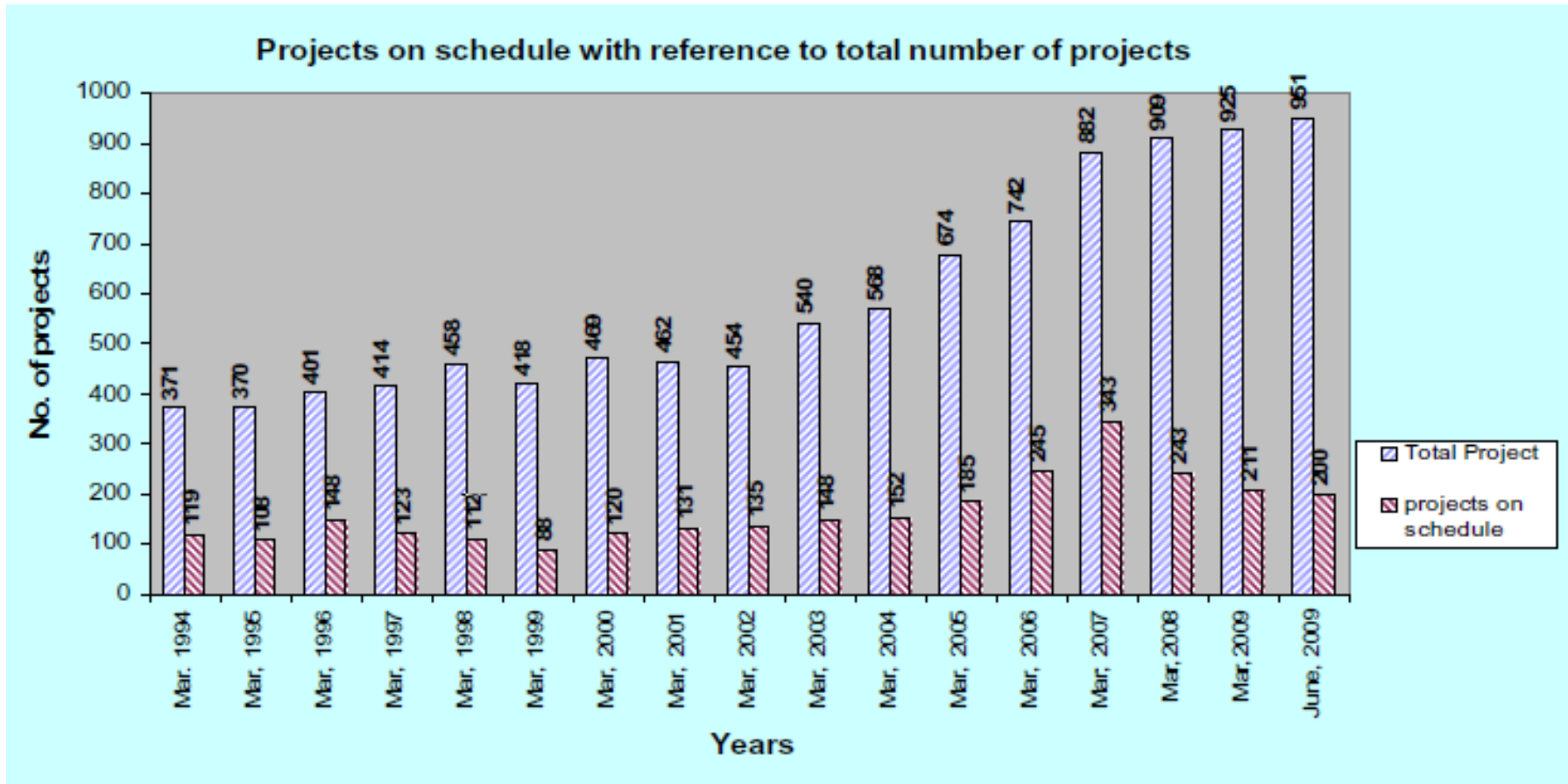
(Status of Projects as on 30.06.2009)

(Number of Projects)

Sector	Ahead		On Schedule		Delayed		Without DOC	
	Original	Latest	Original	Latest	Original	Latest	Approved	Anticipated
ATOMIC ENERGY	0	0	2	2	3	3	0	0
CIVIL AVIATION	1	1	4	4	22	22	0	4
COAL	7	8	49	52	55	51	5	18
I & B	0	0	0	0	0	0	1	1
MINES	0	0	0	0	1	1	0	0
STEEL	0	0	11	11	37	37	0	6
PETROLEUM	2	2	24	24	33	33	0	1
POWER	0	0	50	51	33	32	3	2
HEALTH & FW	0	0	0	0	0	0	0	1
RAILWAYS	1	1	6	24	67	65	131	122
ROAD TRANSPORT & HIGHWAYS	2	2	26	26	159	159	0	9
SHIPPING & PORTS	3	3	10	11	24	23	3	15
TELECOMMUNICATION	0	0	6	6	27	27	0	11
URBAN DEVELOPMENT	0	1	10	9	12	12	3	5
WATER RESOURCES	0	0	0	0	1	1	0	0
INFORMATION TECHNOLOGY	0	0	2	2	0	0	0	0
<b>Total</b>	<b>16</b>	<b>18</b>	<b>200</b>	<b>222</b>	<b>474</b>	<b>466</b>	<b>146</b>	<b>195</b>

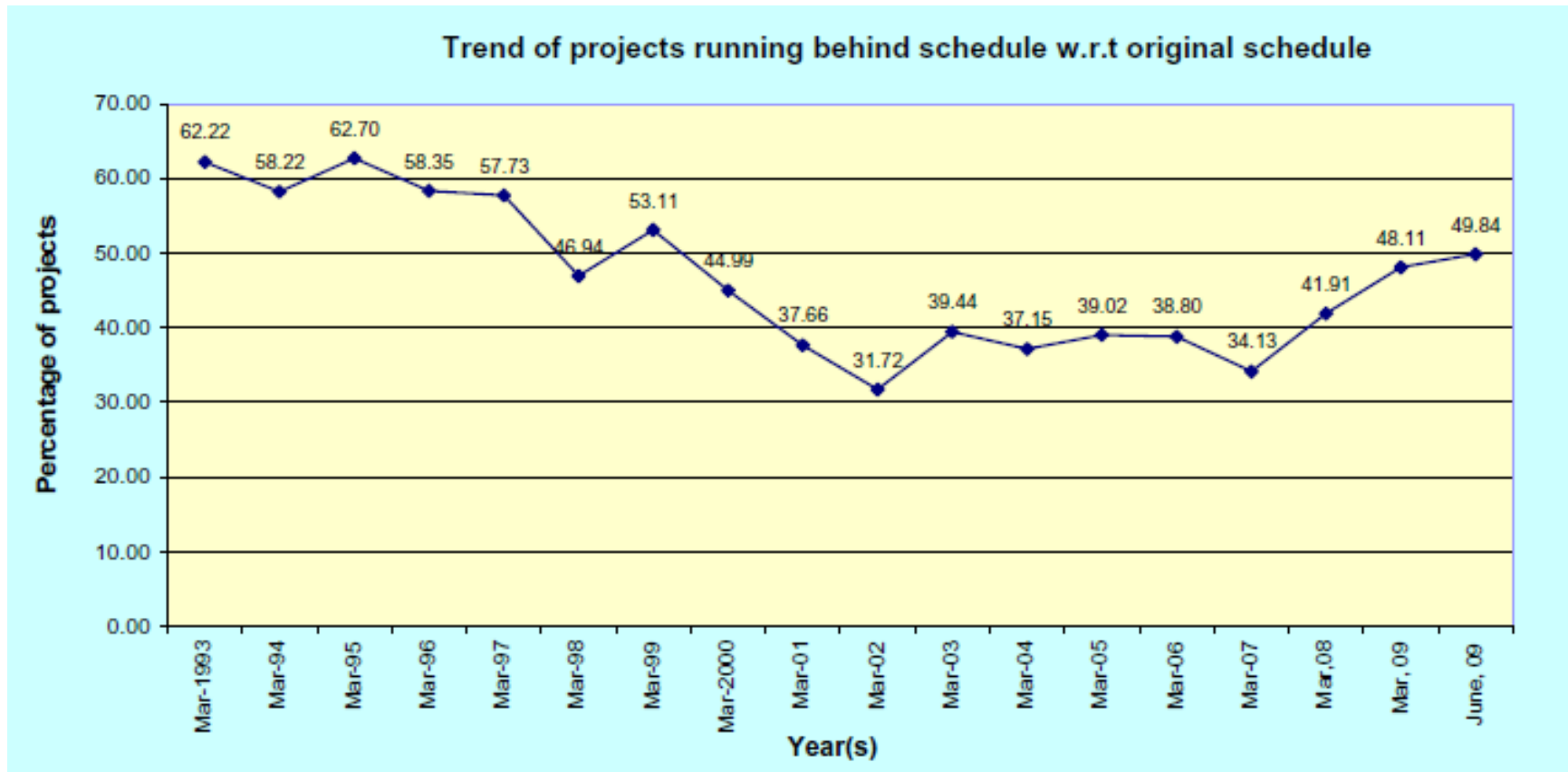
**Source:** Project implementation status of Central Sector Projects, April – June 2009, MOSPI

# Some Surveys on Project Implementation...



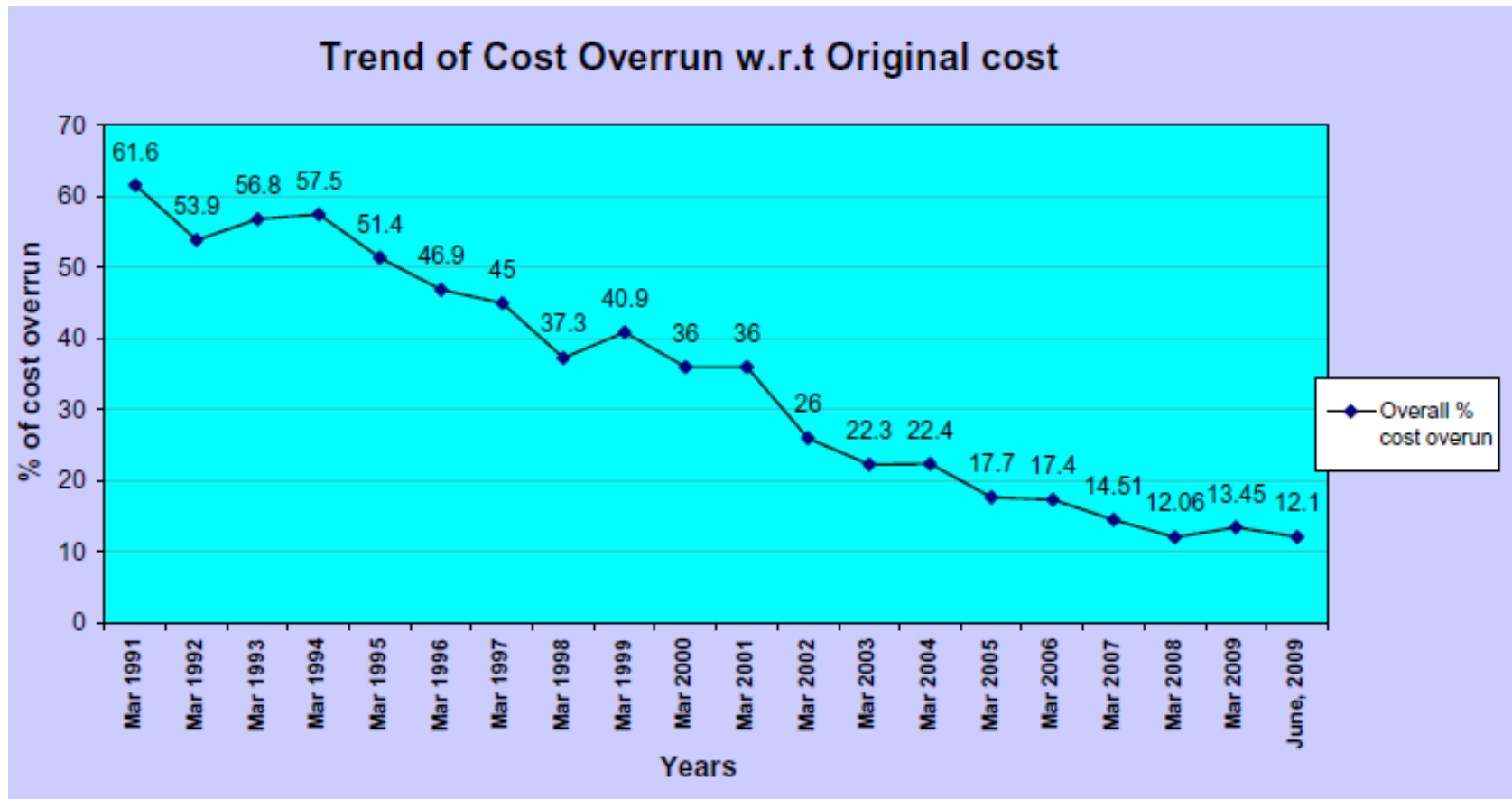
**Source:** Project implementation status of Central Sector Projects, April – June 2009, MOSPI

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# Strategic Project Management

- Logical Framework Approach \*
- Also known as
  - Goal Oriented Project Planning (GOPP)
  - Objectives Oriented Project Planning (OOPP)
- Developed in 1969 for US Agency for International Development (USAID)
  - Design, Monitoring and Evaluation of projects

\* “Strategic Management Made Simple: Practical Tools for Leader and Teams” by Terry Schmidt

Wikipedia: Logical framework approach

“The logical framework approach” by Keerti Bhusan Pradhan

- Four Critical Questions
  - What is to be accomplished and why
  - How is success to be measured
  - What other conditions are necessary
  - How do we get there
- Four by four Table
  - Four rows
    - Describe different types of events
  - Four columns
    - Provide information about the events

- Four levels / rows
  - Goal
    - High level objective to which the project contributes
  - Purpose
    - Anticipated impact from outcomes
  - Outcomes
    - Results that the project must deliver
  - Inputs
    - Activities and resources necessary to deliver outcomes

- Four columns
  - First Column
    - Narrative description of event
  - Second Column
    - Success measures / Objectively Verifiable Indicators (OVI)
  - Third Column
    - Means of Verification (MoV)



- Fourth Column

- Assumptions

- External factors that influence positively or negatively the events
    - List includes all the factors that have an impact
    - Not directly controllable
    - Project dependency on external factors
    - Killer assumptions

- Temporal Logic
  - If activities are undertaken and the assumptions hold, then the outputs will be delivered
  - If the outputs are delivered and the assumptions hold, then the purpose will be achieved
  - If the purpose is achieved and the assumptions hold, then the Goal will be realised

Narrative Summary	Verifiable Indicators (OVI)	Means of verification (MOV)	Important assumptions
1. Goal: Contribute to improved eye health in the specified community	Decrease in eye health issues/ problems by a specified percentage	Testing for eye health	
2. Purpose: Increased utilization of eye health services	Number of persons utilizing the service is at least a certain percentage	i) Records maintained ii) Survey of population	Patients follow the treatment
3. Outputs: (a) Increased access to eye health services (b) Provision of cost effective comprehensive and high quality eye health services	i) Types and cost of services offered ii) Location of facilities, timings of service iii) Capability of staff	i) Records maintained ii) Survey of community	People are willing to pay the charges for better eye health care
4 . Inputs/activities: (a) Provide health care facilities (b) Procure consumables and equipment (c) Training of staff (d) Create awareness	i) Facilities and consumables procured ii) Contents of training sessions iii) Attendance of staff iv) Publicity generated	(i) Records maintained (ii) Training sessions conducted (iii) Attendance (iv) Survey	Budget and manpower are available

# Project Life Cycle

- ❖ Time between the start and end of the project
- ❖ Consists of various phases
- ❖ Each phase includes
  - Work to be done
  - Set of inter-related activities
  - Deliverables

- Hand off from one phase to another
  - ✓ Results upto that point are reviewed
  - ✓ Necessary directional inputs are given
  - ✓ Acts as a control gate
- ❖ Different from Product Life Cycle
  - Product Life Cycle
    - ✓ Inception
    - ✓ Creation
    - ✓ Use till the end<sub>29</sub>

➤ Project life cycle is a subset of product life cycle

✓ Inception and creation of Product

❖ Typical Project

➤ Slow start followed by

➤ Quick Momentum followed by

➤ Slow finish

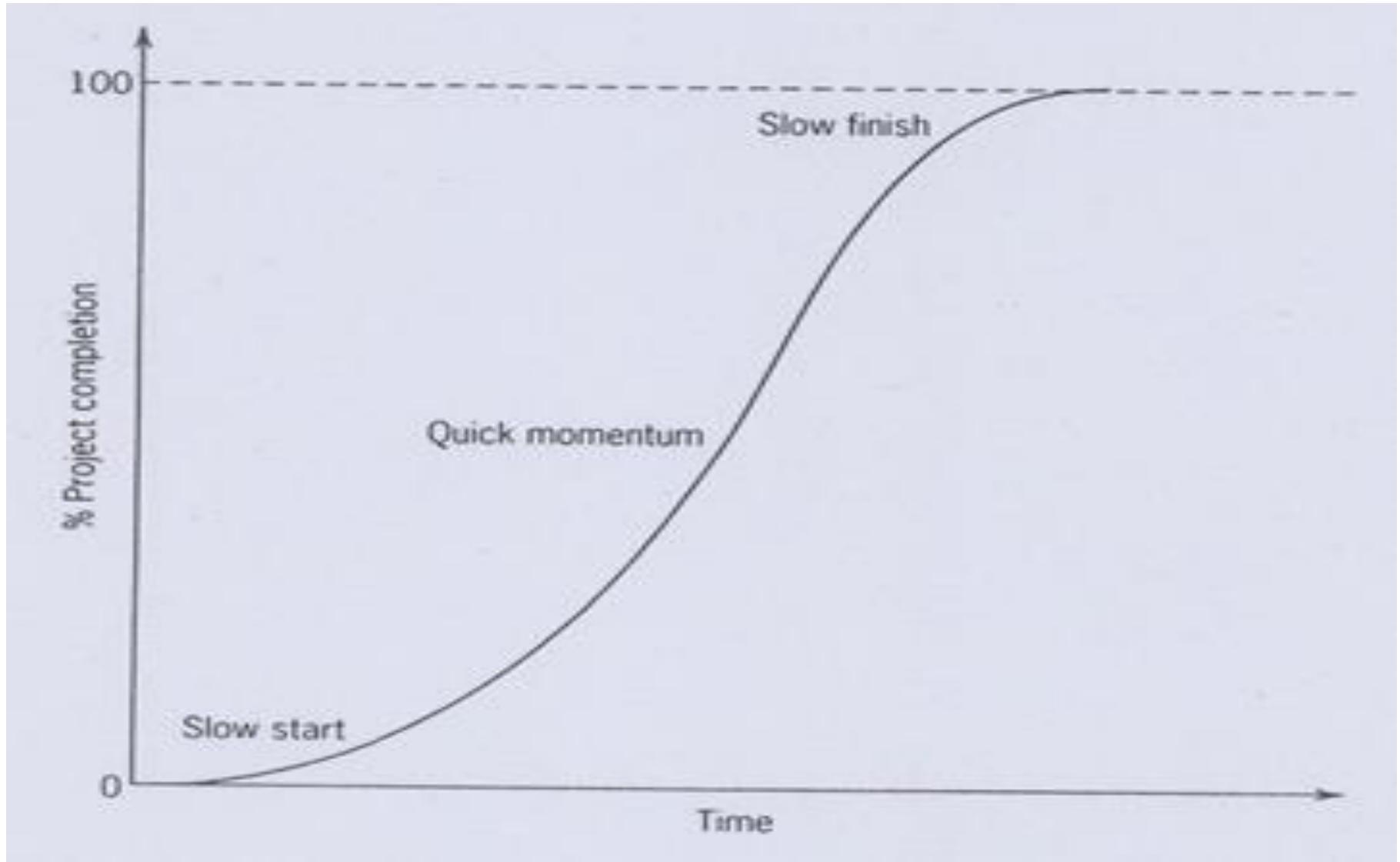


Figure 1-2 from Text: Page 7

# Project Life Cycle Phases

- ❖ Phase 1: Project definition and initiation
  - Project Management Body of Knowledge (PMBOK) Guide : Starting the project
  - Defining stage
    - ✓ Project is conceived



- ✓ Preliminary scope, budget, schedule, etc., estimated
- ✓ Approvals obtained
- Project charter is deliverable
- Handed over to project team for detailed planning

## Project Charter:

- ❖ Document issued by project initiator / sponsor
  - Authorizes existence / creation of the project
  - Authority to project manager to utilize resources
  - Reference for making all major decisions during project life cycle
  - Document includes a summary of all important aspects considered while authorizing the project

- ❖ High level study should have been undertaken prior to issue of charter
- ❖ Includes
  - Justification of project
  - Alignment with strategy
  - Major objectives
  - Measurable criteria for success
  - High level description of requirements and outcome of the project
  - Overview of project risks

- Constraints and assumptions based on organizational and external factors
- Major project activities completion milestones / dates
- Project cost estimate and budget
- Nomination of project manager and members of project team
- Responsibilities and authority levels of project team
- Name, designation and authority of person authorizing the project charter

- ❖ Phase 2: Project planning and scheduling
- ❖ PMBOK Guide : Organizing and preparing
  - Planning Stage
  - Integrated detailed plans for
    - Activities
    - Proactively managing
      - ✓ Scope, Schedule and budget
      - ✓ Procurement, quality and communications
      - ✓ Project team
  - Detailed plans are deliverable
  - Handed over for execution

## ❖ Phase 3: Project Implementation

➤ PMBOK Guide: Carrying out the project work

➤ Executing Stage

- ✓ Project manager and team ensure that
  - Work planned during the planning stage is carried out
  - Authorized resources are used
- ✓ Monitor and control to ensure
  - Quality, technical and performance specifications
  - Completion as per milestones and budget

## Phase 4: Project termination

- PMBOK Guide : Closing the project
- Delivering stage
  - ✓ Deliverables are checked to ensure meeting
    - Agreed specifications and
    - Criteria for success
  - ✓ Settle procurement contracts
  - ✓ Hand over documentation and project to client
  - ✓ Disbanding the team

# Project Life Cycle Phases ...contd...

- ❖ At each phase, a review process is structured and carried out
  - Outcome of review is to
    - ✓ Continue or
    - ✓ Redirect or
    - ✓ Hold or
    - ✓ Terminate the project



# Project Life Cycle Phases ...contd...

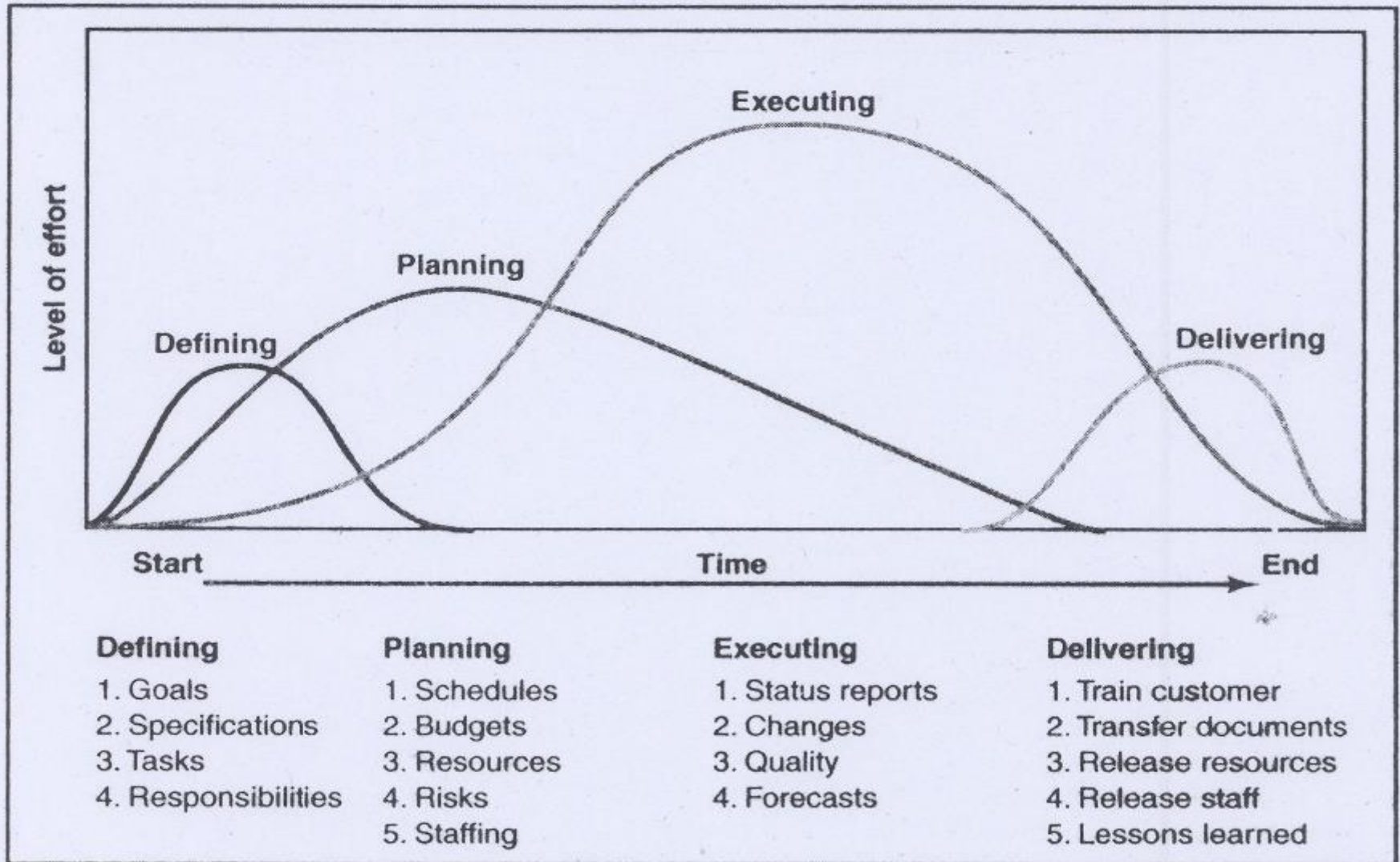


Figure 1.2 from Project Management: The Managerial Process, Fourth Edition, Special Indian Edition by Clifford F. Gray, Erik W. Larson and Gautam V Desai

# Program

- ❖ Group of related projects :
  - Managed in a coordinated way
  - Benefits not available for managing them individually
  
- Examples
  - ✓ Golden quadrilateral corridors
  - ✓ Defense Research Department Organizations' program for defense missile systems

## Portfolio

- ❖ Collection of projects and programs grouped together
  - To focus on specific business strategy
  
- ❖ Wider than projects and programs
  
- ❖ Need not be related projects
  - May be in different sectors
  - Strategic diversification
  
- ❖ Managed at the highest managerial level

# Project Manager

- ❖ Same functions as other managers
  - Plan, Schedule, Motivate and Control
  
- ❖ Manage
  - Temporary and non-repetitive activities
  - Fixed life project
  - Customer expectations
    - ✓ Feasible and reasonable
  
- ❖ Create
  - Project Team
  - Structure / organization

- ❖ Work with diverse set of people
  - Provide to team members
    - ✓ Direction, Co-ordination and Integration
  - Other functional managers
    - ✓ Support in terms of
      - Knowledge / expertise
      - Availability of team members

## ➤ Outsiders

- ✓ Typically do not have project allegiance
- ✓ Vendors / Suppliers
- ✓ Sub contractors
- ✓ Other stakeholders

## ❖ Conflict Resolution

## ❖ Responsible for performance

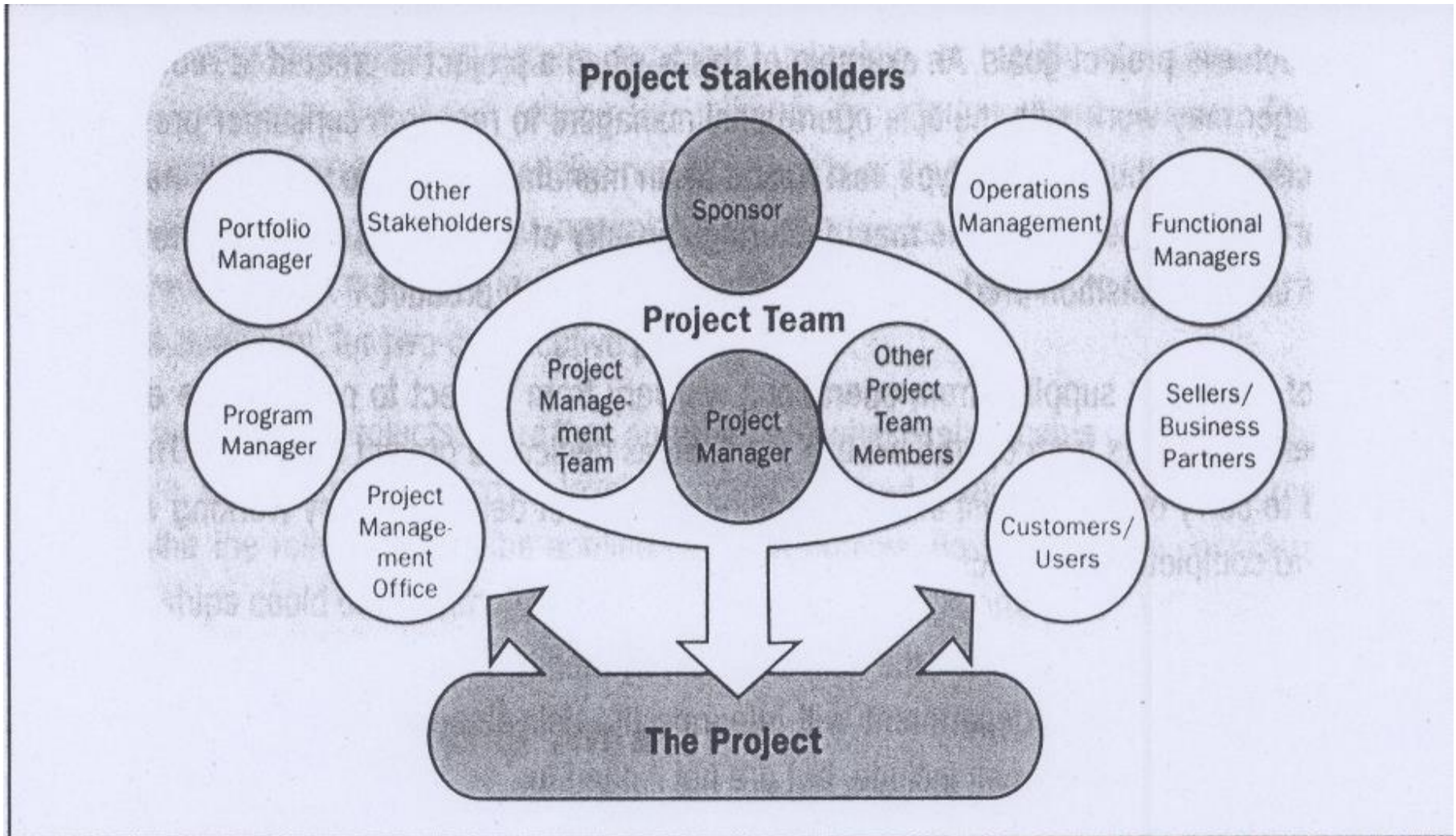
- Scope
- Work Breakdown structure
- Schedules
- Resource allocation
- Budgets
- Status Reports

- Monitoring
- Quality
- Appropriate trade off between Time, Cost and Performance requirement
- ❖ Closure of project
  - Documentation
  - Dissolution of team



# Stakeholders

- ❖ Individuals or organizations
  - Actively involved
  - Impacted by the project
- ❖ Many more people than initially thought of
- ❖ Different stakeholders may want different and possibly conflicting outcomes
- ❖ Communication with all stakeholders is important



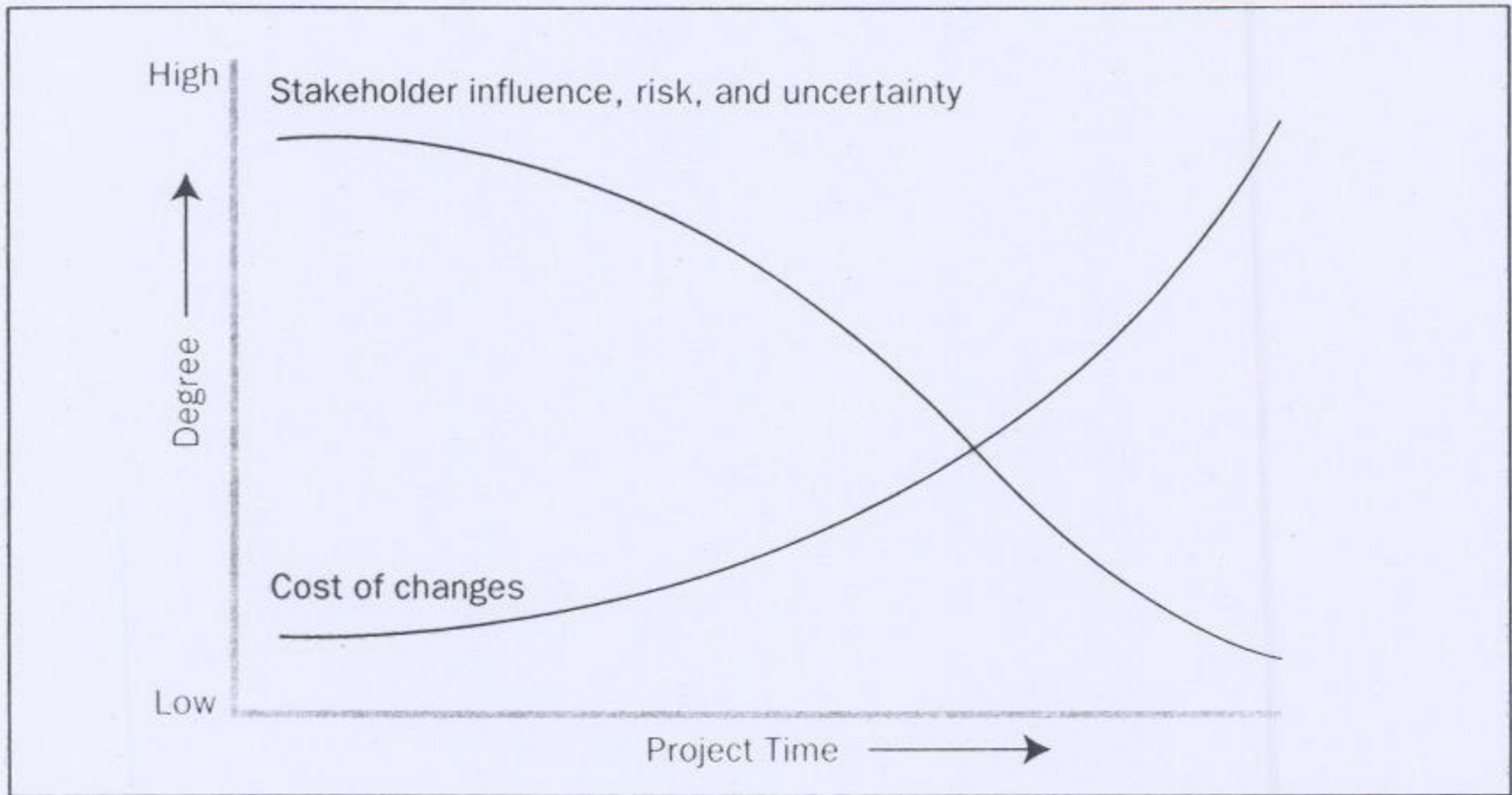


Figure 2-2. Impact of Variable Based on Project Time

# Organization Structure

- ❖ Existing functional hierarchy
  - Grouping by functions
    - ✓ Engineering, Production
    - ✓ Marketing, Accounting etc.
    - ✓ Further sub-divisions also may be there
  - Each employee reports to one person

- Segments of project delegated to functional department
- Each department will do the project work independently
- May be appropriate if one functional area has a dominant role
  - ✓ High ranking manager in that area is given responsibility to coordinate Project

## ➤ Advantages

- ✓ No change
- ✓ Flexibility in use of staff
- ✓ Expertise of the dominant functional area can be utilized
- ✓ Easy transition after closure of project

## ➤ Disadvantages

### ✓ Lack of focus

- Staff have other work

### ✓ Slow

- Priority may be to other work

### ✓ Poor Integration

- Each concerned only with their work
- Not concerned about fit with work done by other departments

### ✓ Lack of ownership

## ❖ Dedicated Project Team

- At the other end of the spectrum to functional organization
- Independent of other functions
- Full time project manager
- Team members chosen



## ❖ Advantages

- Functional organization remains intact
- Cohesive team
  - ✓ High motivation
- Cross functional integration
  - ✓ Specialists from various functions work together
- Faster completion
  - ✓ Members devote full time

## ❖ Disadvantages

### ➤ Can be expensive

- ✓ New position of project manager

- ✓ Resources assigned on a full time basis

### ➤ Conflict

- ✓ Between team and other units

  - Apple example

### ➤ Inadequate expertise

- ✓ Expertise may be limited to only team members

### ➤ Difficult transition after closure of project

## ❖ Matrix organization

Quote from GLD:

Matrix management works, but it sure is difficult at times. All matrix managers must keep up their health and take stress – Tabs  
- A Project Manager

- Hybrid organization
- Project management structure is overlaid on functional hierarchy
- Two (sometimes more?) chains of command
  - ✓ Project team members report to
    - Functional head
    - Project head

## ➤ Forms of Matrix organization

- ✓ Depends upon relative authority of

- Functional manager and project manager

- ✓ Weak or light weight Matrix

- Authority of project manager is weak

- Project managers have responsibility but weak authority

- Authority strongly in favour of functional manager
- Project managers prepare schedules, milestones, reports etc. and monitor
- Functional manager decides who is to do what and when

- ✓ Balanced or middle weight Matrix
  - Authority is shared by project manager and functional manager
  - Project manager
    - Establishes plan, schedules and standards
    - Monitors progress and integrates work done by departments

- Functional manager
  - Assigns staff
  - Ensures execution according to schedules and standards set by Project Manager
- Close coordination and typically joint approval of decisions



➤ Strong or heavy weight matrix

- ✓ Project structure within a matrix environment
- ✓ Authority is strongly in favour of project manager
- ✓ Project manager
  - Establishes plans, schedules and standards

- ✓ Decides on scope trade off and assignment of functional personnel
- ✓ Functional manager is consulted on a need basis
  - Sometimes departments may be like sub-contractors

## ❖ Advantages of Matrix Structure

- ✓ More efficient than project structure
  - Resources are shared across projects
  
- ✓ Better project focus than functional structure
- ✓ Flexible in terms of utilization of knowledge and expertise
  
- ✓ Post transition is easier than in project structure

- Disadvantages of Matrix Structure
  - ✓ Conflict between project managers and functional managers
  - ✓ Fighting for resources shared across projects
  - ✓ Stressful for team members
    - No unity of command
    - One boss too many

**Table 2-1. Organizational Influences on Projects**

Project Characteristics / Organization Structure	Functional	Matrix			Projectized
		Weak Matrix	Balanced Matrix	Strong Matrix	
Project Manager's Authority	Little or None	Limited	Low to Moderate	Moderate to High	High to Almost Total
Resource Availability	Little or None	Limited	Low to Moderate	Moderate to High	High to Almost Total
Who controls the project budget	Functional Manager	Functional Manager	Mixed	Project Manager	Project Manager
Project Manager's Role	Part-time	Part-time	Full-time	Full-time	Full-time
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

# Organization Culture

- Project friendly culture
  - ✓ Team work and cross-functional cooperation are dominant
  - ✓ Conflict is voiced and dealt with effectively
  - ✓ Commitment to Excellence
  - ✓ Functional organization or weak matrix organization can deliver results

- Project unfriendly culture
  - ✓ Individualism is encouraged
  - ✓ Promotions / increments based on relationships with superiors
  - ✓ Low tolerance for conflict
  - ✓ Project manager and team have to overcome the negative forces
  
- ✓ Better to insulate the project team from the organization culture
- ✓ Create a distinct team sub-culture
- ✓ Dedicated project team is preferred. Alternatively a strong matrix structure would be required

## ➤ Other cultural situations

- ✓ Degree of project friendly culture has to be assessed
- ✓ If adequate project friendly culture exists, balanced or strong matrix structure may be appropriate
- ✓ Otherwise, dedicated project team may become necessary