



Project Management in Engineering

By

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Course Materials

- ❖ ***Harold Kerzner, Project Management: A Systems Approach To Planning, Scheduling and Controlling, 10th Edition, 2009, Wiley***
- ❖ ***Harold Kerzner, Project Management Case Studies, 4th Edition, 2013, Wiley***



Course Details

- ❖ **8 Homeworks (every week related case studies will be examined) (%2,5*8)**
- ❖ **Term Project (will be present at the last three weeks) groups of 3 people. (25-30 minutes each) (%15)**
- ❖ **Midterm (%25)**
- ❖ **Final Exam (%40)**
- ❖ **To have a visa for the final exam at least 6 case study homeworks and term project presentation should be done **on time!!!****



Outline

Date	Week	Topic
14.09.2017	1	Introduction-Chapter 1
21.09.2017	2	Chapter 2 and Chapter 3
28.09.2017	3	Chapter 4 and Chapter 5 Homework1: Case Studies: 1. Ferris Healthcare Inc. 2. Macon Inc. 3. Apache Metals
05.10.2017	4	Chapter 6,7,8,9 and10 Homework2: Case Studies: 1. White Manufacturing 2. Ducor Chemical
12.10.2017	5	Chapter 11 Homework3: Case Studies: 1. The estimating Problem 2. Payton Corporation
19.10.2017	6	Chapter 12 and 13 Homework4: Case Studies: 1. The scheduling Dilemma 2. Quantum Telecom
26.10.2017	7	Problem Session Homework5: Case Studies: 1. The Prima Donna 2. The Bathtub

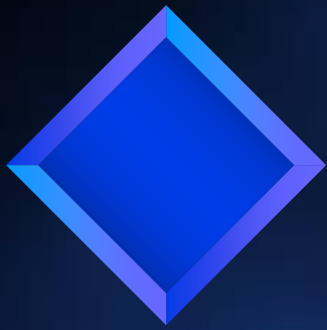


Date	Week	Topic
09.11.2017	8	Midterm
16.11.2017	9	Chapter 14-15 and 16 Homework6: Case Studies: 1. The Need For Project Metric (c) 2. The Need For Project Metric (d)
23.11.2017	10	Chapter 17-18 and 19 Homework7: Case Studies:1. The Need For Project Metric (g) 2. Parker Telecom
30.11.2017	11	Chapter 20-21 nad 22 Homework8: Case Studies: 1. Telestar International 2. Is it Fraud?
07.12.2017	12	Project Presentations
14.12.2017	13	Project Presentations
21.12.2017	14	Project Presentations

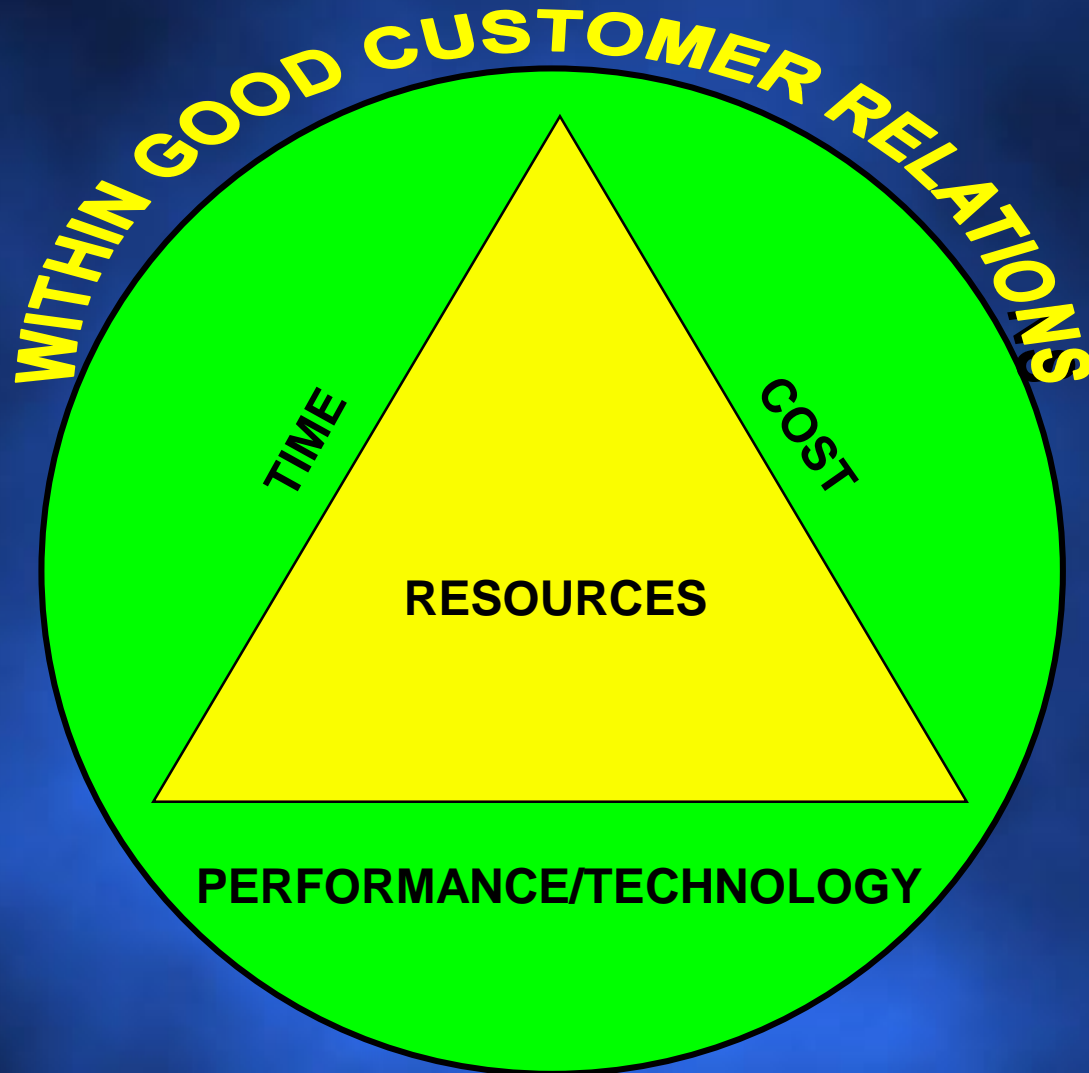


Chapter One

Overview



OVERVIEW OF PROJECT MANAGEMENT



Project Characteristics

- ❖ Have a specific objective (which may be unique or one-of-a-kind) to be completed within certain specifications
- ❖ Have defined start and end dates
- ❖ Have funding limits (if applicable)
- ❖ Consume human and nonhuman resources (i.e., money, people, equipment)

- ❖ Be multifunctional (cut across several functional lines)





Project Management

❖ Project Initiation

❖ Project Planning

- Definition of work requirements
- Definition of quantity and quality of work
- Definition of resources needed

❖ Project Execution

❖ Project Monitoring&Control

- Tracking progress
- Comparing actual outcome to predicted outcome
- Analyzing impact
- Making adjustments

❖ Project Closure



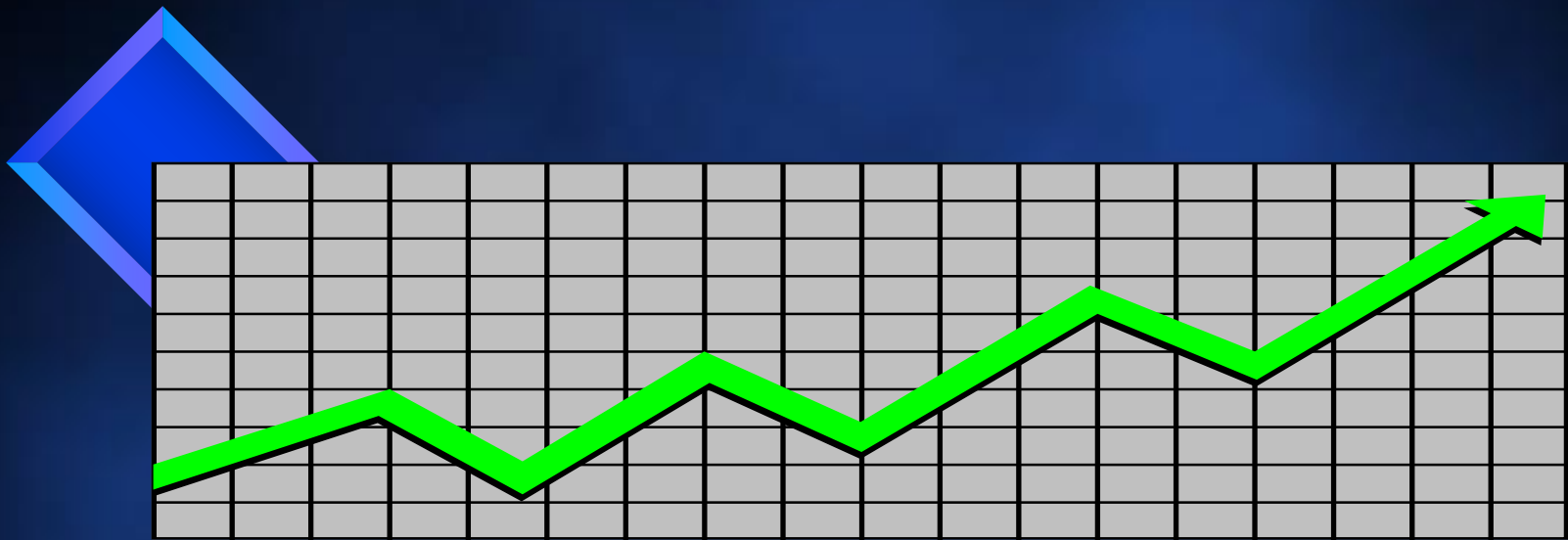
Successful project management

❖ Having Achieved Project Objectives

- Within time
- Within cost
- At the desired performance/technology level
- While utilizing the assigned resources effectively and efficiently
- Accepted by the customer



WHY USE PROJECT MANAGEMENT ?



❖ Project Management and productivity are
RELATED!

MATURITY IN PROJECT MANAGEMENT IS LIKE A THREE - LEGGED STOOL.

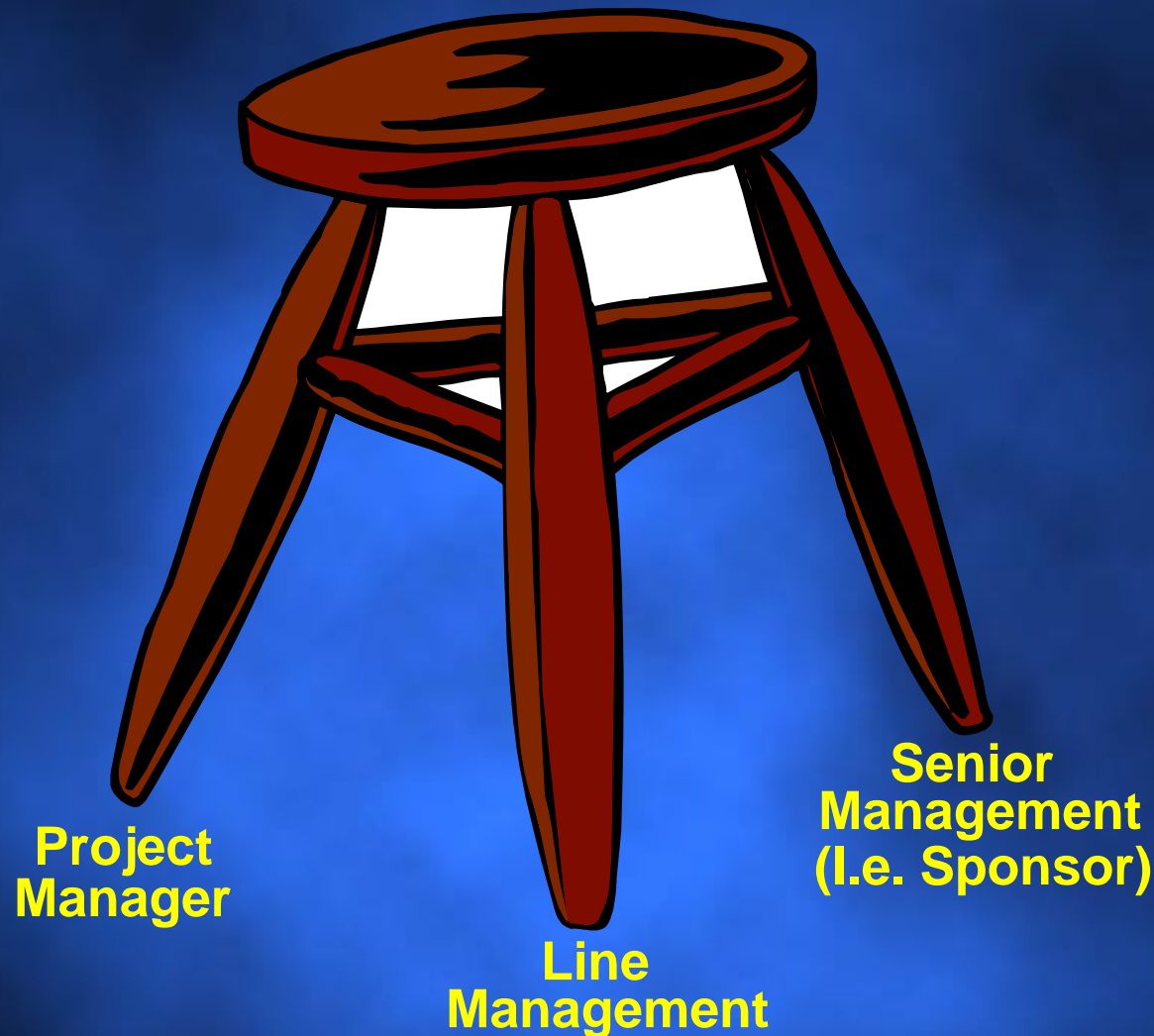
THE LEGS REPRESENT THE:



- ❖ **Project Manager**
- ❖ **Line Manager(s)**
- ❖ **Executive Management (i.e... Project Sponsor)**

Maturity cannot exist without stability

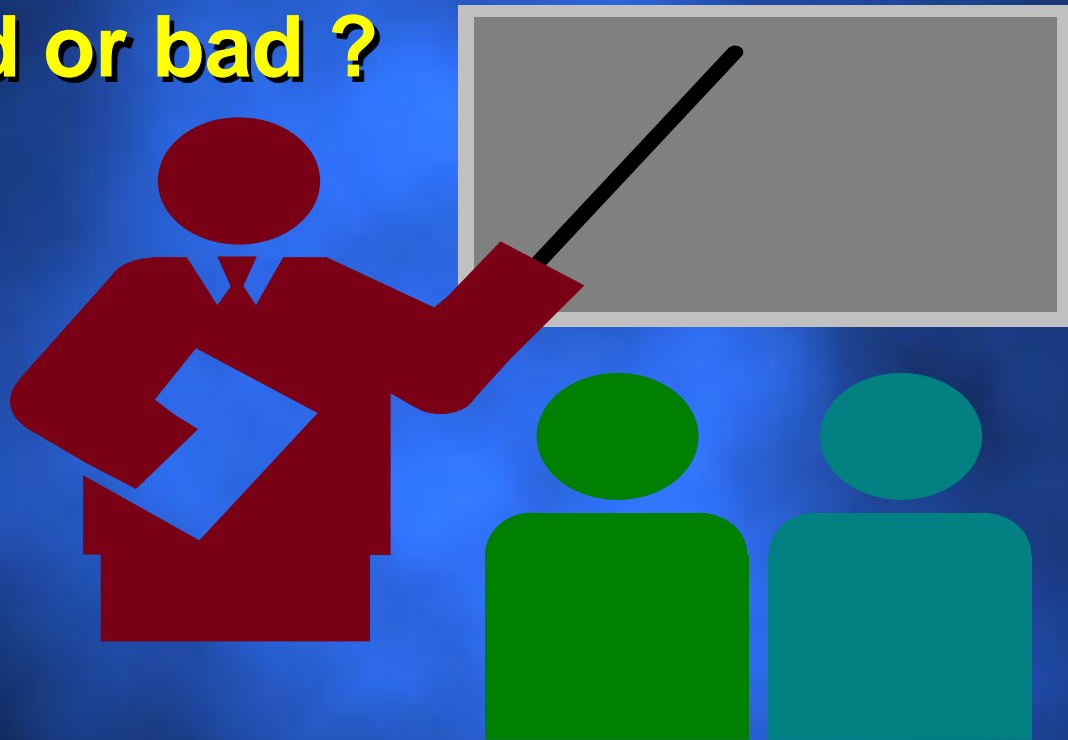
The Three-Legged Stool





Critical Questions

- ❖ **How important is Project Management training ?**
- ❖ **Part-time Project Management - is it good or bad ?**

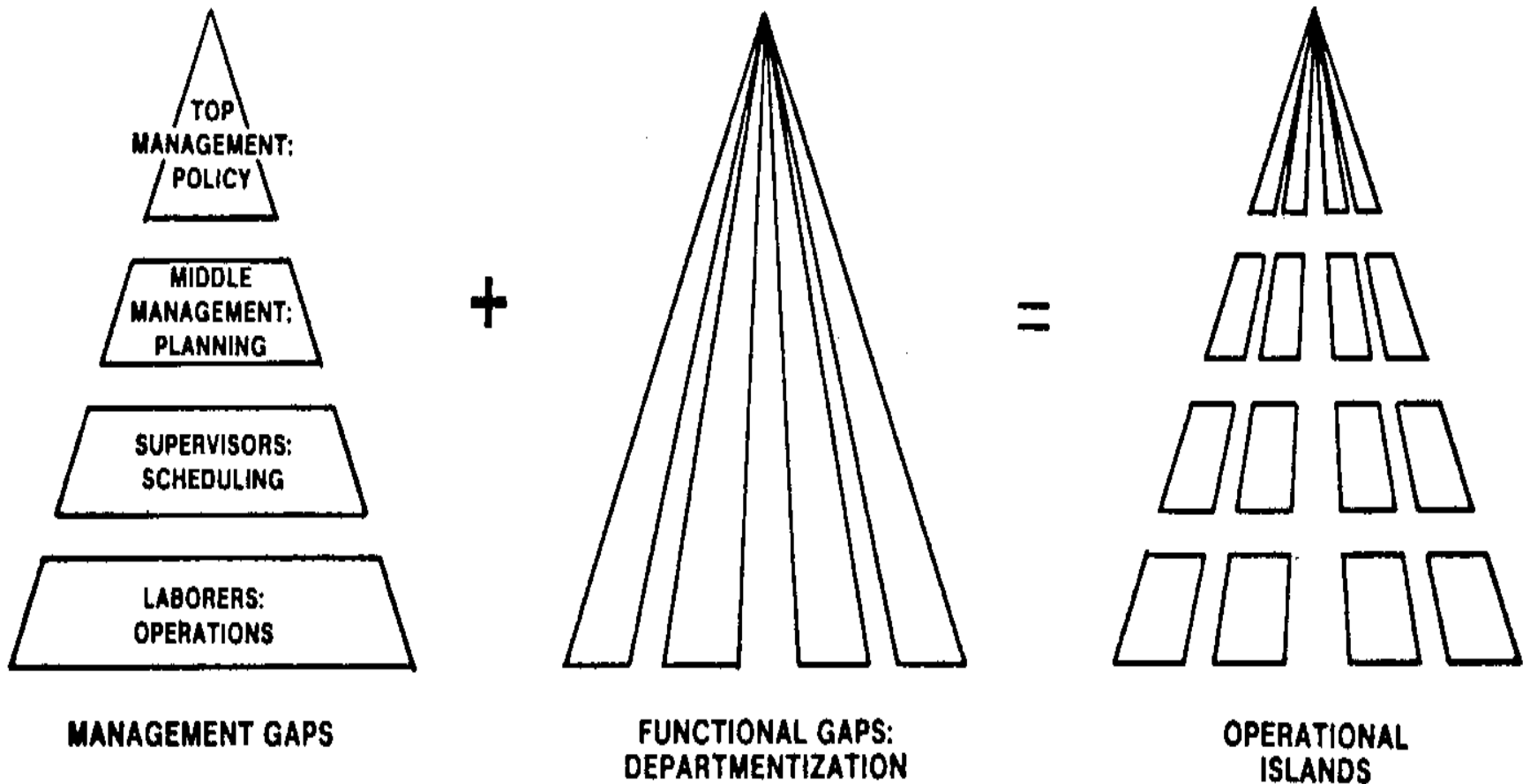




Project Management Activities

- ❖ **Role of the Project Manager**
- ❖ **Negotiating for Resources**
- ❖ **Establishing the project's policies and procedures**
- ❖ **Laying out the project workflow and plan**
- ❖ **Establishing Performance Targets**
- ❖ **Obtaining Funding**
- ❖ **Executing the Plan**
- ❖ **Encouraging the team to focus on deadlines**
- ❖ **Evaluating Performance**
- ❖ **Develop Contingency Plans**
- ❖ **Briefing the team, Briefing the customer**
- ❖ **Closing out the project**

Why is a Project Management System Necessary?



Project Management





Benefits

- ❖ **Identification of functional responsibilities to ensure that all activities are accounted for, regardless of personnel turnover.**
- ❖ **Minimizing the need for continuous improvement**
- ❖ **Identification of time limits for scheduling**
- ❖ **Identification of a methodology for trade-off analysis**
- ❖ **Measurement of accomplishment against plans**



Benefits (continued)

- ❖ **Early identification of problems so that corrective action may follow**
- ❖ **Improved estimating capability for future planning**
- ❖ **Knowing when objectives cannot be met or will be exceeded**



Obstacles

- ❖ **Project complexity**
- ❖ **Customer's special requirements and scope changes**
- ❖ **Organizational restructuring**
- ❖ **Project risks**
- ❖ **Changes in technology**
- ❖ **Forward planning and pricing**



Humor

❖ **Project management is the art of creating the illusion that any outcome is the result of a series of predetermined, deliberate acts when, in fact, it was dumb luck.**



Classical Management

- ❖ **Planning**
- ❖ **Organizing**
- ❖ **Staffing**
- ❖ **Controlling**
- ❖ **Directing**

**Which of the above is Usually NOT
performed by the project manager?**



Resources

- ❖ **Money**
- ❖ **Manpower**
- ❖ **Equipment**
- ❖ **Facilities**
- ❖ **Materials**
- ❖ **Information/technology**



Successful Culture

❖ Successful project management is strongly dependent on:

- **A good daily working relationship between the project manager and those line managers who directly assign resources to projects**
- **The ability of functional employees to report vertically to their line manager at the same time they report horizontally to one or more project managers**



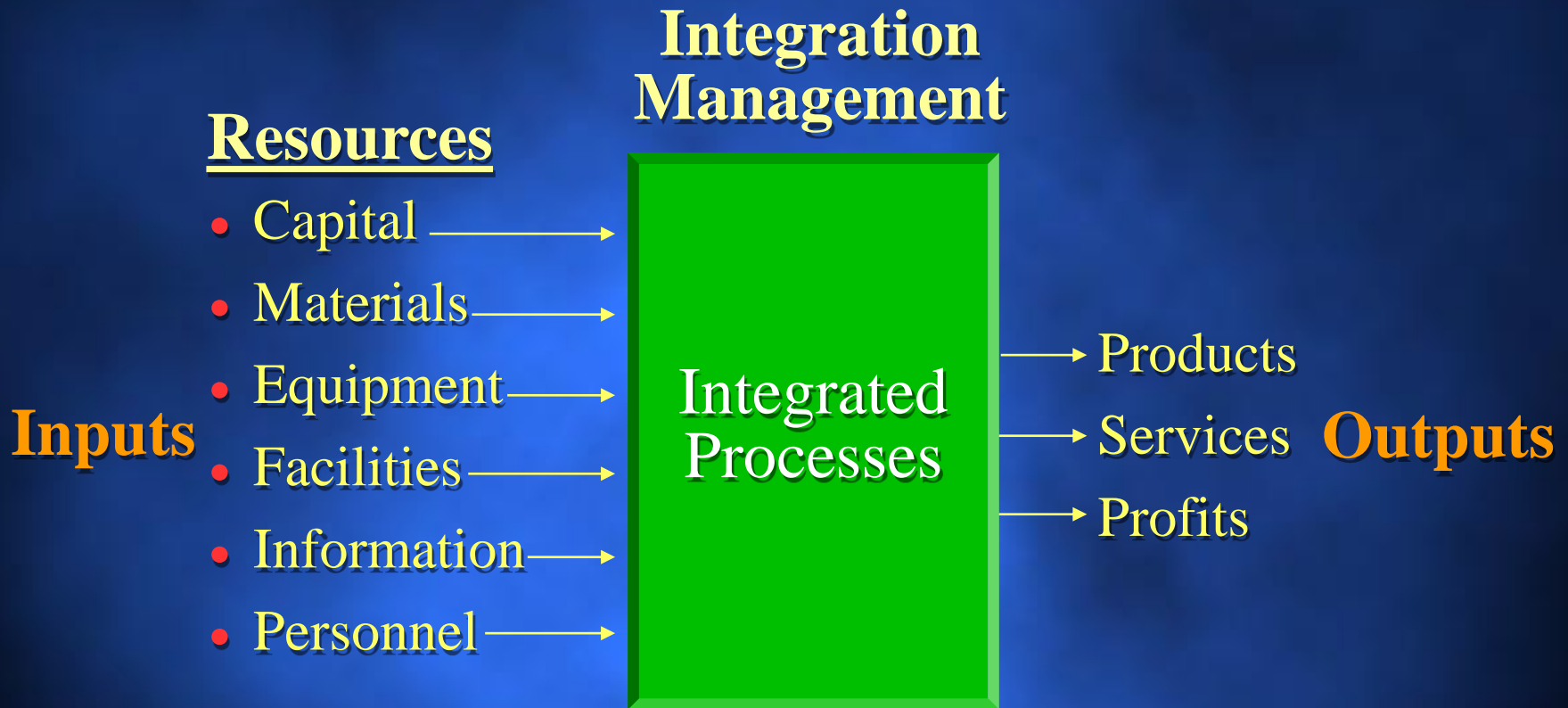
Interface Management

- ❖ **Managing human interrelationships within the project team**
- ❖ **Managing human interrelationships between the project team and the functional organization**
- ❖ **Managing human interrelationships between the project team and senior management**
- ❖ **Managing human interrelationships between the project team and the customer's organization, whether an internal or external organization**



As part of interface management, the project manager's role also includes integration management.

Integration Management





The Functional Role

- ❖ The functional manager has the responsibility to define how the task will be done and where the task will be done (i.e., the technical criteria)
- ❖ The functional manager has the responsibility to provide sufficient resources to accomplish the objective within the project's constraints (i.e., who will get the job done).
- ❖ The functional manager has the responsibility for the deliverable.



Functional Obstacles

- ❖ **Unlimited work requests (especially during competitive bidding)**
- ❖ **Predetermined deadlines**
- ❖ **All requests having a high priority**
- ❖ **Limited number of resources**
- ❖ **Limited availability of resources**
- ❖ **Unscheduled changes in the project plan**
- ❖ **Unpredicted lack of progress**



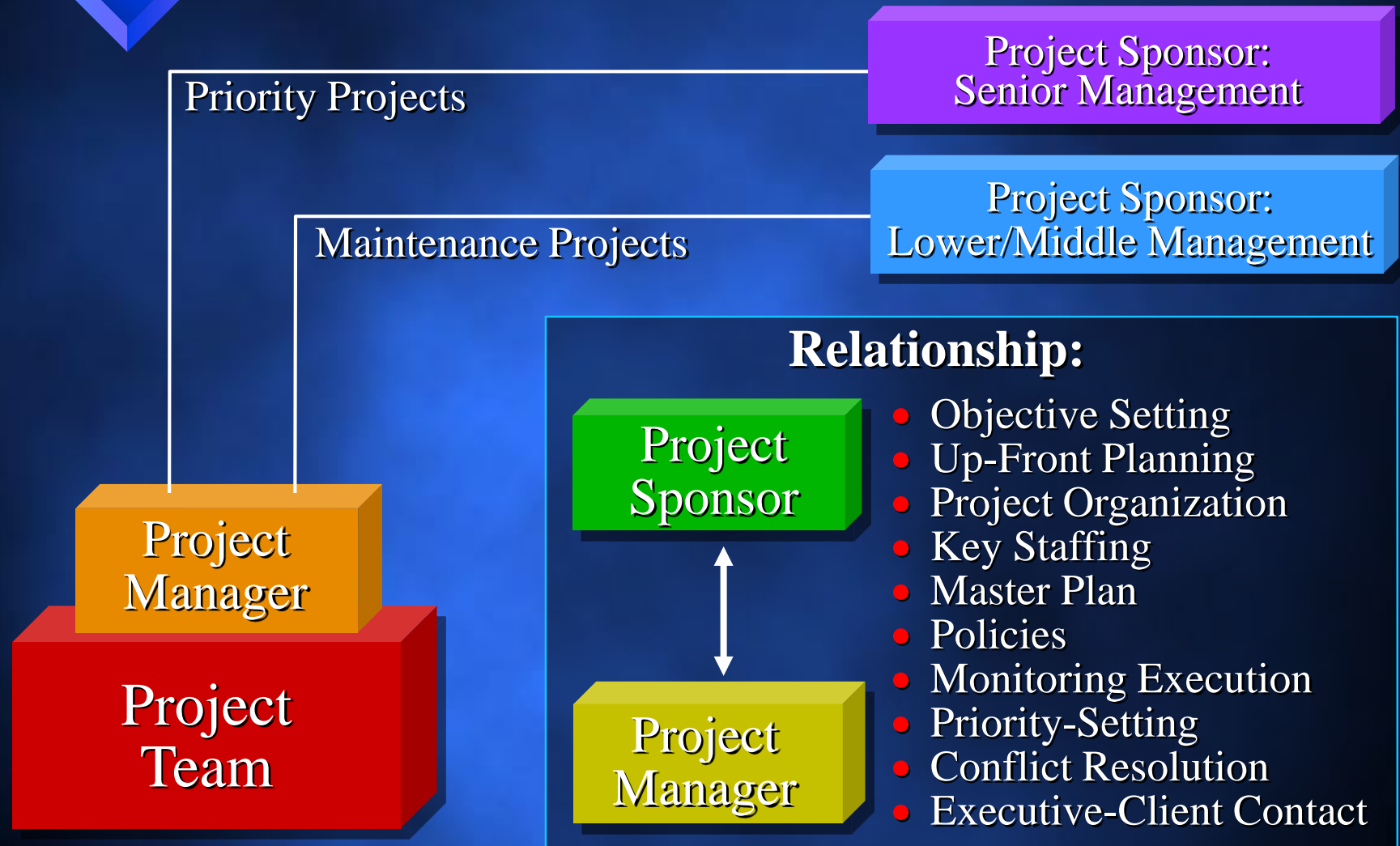
Functional Obstacles (continued)

- ❖ **Unpredicted lack of progress**
- ❖ **Unplanned absence of resources**
- ❖ **Unplanned breakdown of resources**
- ❖ **Unplanned loss of resources**
- ❖ **Unplanned turnover of personnel**



Most projects also have a project sponsor which may or may not reside at the executive levels of management.

The Project Sponsor Interface





Project Necessities

- ❖ **Complete task definitions**
- ❖ **Resource requirement definitions (and possibly skill levels needed)**
- ❖ **Major timetable milestones**
- ❖ **Definition of end-item quality and reliability requirements**
- ❖ **The basis for performance measurement**



Results of Good Planning

- ❖ Assurance that functional units will understand their total responsibilities toward achieving project needs.
- ❖ Assurance that problems resulting from scheduling and allocation of critical resources are known beforehand.
- ❖ Early identification of problems that may jeopardize successful project completion so that effective corrective action and replanning can occur to prevent or resolve problems.



Promises Made???

- ❖ **Promotion**
- ❖ **Grade**
- ❖ **Salary**
- ❖ **Bonus**
- ❖ **Overtime**
- ❖ **Responsibility**
- ❖ **Future work assignments**



Project Management in Non-Project-Driven Groups

- ❖ **Projects may be few and far between**
- ❖ **Not all projects have the same project management requirements, and therefore they cannot be managed identically. This difficulty results from poor understanding of project management and a reluctance of companies to invest in proper training.**
- ❖ **Executives do not have sufficient time to manage projects themselves, yet refuse to delegate authority.**



Project Management in Non-Project-Driven Groups (Continued)

- ❖ **Projects tend to be delayed because approvals most often follow the vertical chain of command. As a result, project work stays too long in functional departments.**
- ❖ **Because project staffing is on a “local” basis, only a portion of the organization understands project management and sees the system in action.**
- ❖ **There exists heavy dependence on subcontractors and outside agencies for project management expertise.**

High-level Reporting

- ❖ **The project manager is charged with getting results from the coordinated efforts of many functions. He should, therefore, report to the man who directs all those functions.**
- ❖ **The project manager must have adequate organizational status to do his job effectively.**
- ❖ **To get adequate and timely assistance in solving problems that inevitably appear in any important project, the project manager needs direct and specific access to an upper echelon of management**



High-level Reporting (continued)

- ❖ **The customer, particularly in a competitive environment, will be favorably impressed if his project manager reports to a high organizational echelon.**



Low-level Reporting

- ❖ It is organizationally and operationally inefficient to have too many projects, especially small ones, diverting senior executives from more vital concerns.
- ❖ Although giving a small project a high place in the organization may create the illusion of executive attention, its real result is to foster executive neglect of the project.
- ❖ Placing a junior project manager too high in the organization will alienate senior functional executives on whom he must rely for support.

THE TIP-OF-THE-ICEBERG SYNDROME



**DELEGATION
OF AUTHORITY TO
PROJECT MANAGER**

**EXECUTIVE
MEDDLING**

**LACK OF UNDERSTANDING OF HOW PROJECT
MANAGEMENT SHOULD WORK**

**LACK OF TRAINING IN COMMUNICATIONS /
INTERPERSONAL SKILLS**

**MANY OF THE PROBLEMS ASSOCIATED WITH PROJECT MANAGEMENT WILL
SURFACE MUCH LATER IN THE PROJECT AND RESULT IN MUCH HIGHER COSTS**

Project Vs. Functional Influences

