



Chapter Two

*Project Management
Growth: Concepts and
Definitions*



When to Use Project Management

- ❖ Are the jobs **complex**?
- ❖ Are there **dynamic environmental considerations**?
- ❖ Are the **constraints tight**?
- ❖ Are there **several activities to be integrated**?
- ❖ Are there **several functional boundaries to be crossed**?



The Need For Restructuring

- ❖ Accomplish tasks that could not be effectively handled by the traditional structure
- ❖ Accomplish onetime activities with minimum disruption to routine business



Restructuring Problems

- ❖ Project priorities and competition for talent may interrupt the stability of the organization and interfere with its long-range interests by upsetting the normal business of the functional organization.
- ❖ Long-range planning may suffer as the company gets more involved in meeting schedules and fulfilling the requirements of temporary projects.

Restructuring Problems

(Continued)

- ❖ Shifting people from the project to project may disrupt the training of new employees and specialists. This may hinder their growth and development within their fields of specialization.



Imperatives

- ❖ The time span between project initiation and completion appears to be increasing.
- ❖ The capital committed to the project prior to the use of the end item appears to be increasing.
- ❖ As technology increases, the commitment of time and money appears to become inflexible.



Imperatives (Continued)

- ❖ Technology requires more and more specialized manpower.
- ❖ The inevitable counterpart of specialization is organization.
- ❖ The above five “imperatives” identify the necessity for more effective planning, scheduling, and control.



Obstacles

- ❖ Unstable economy
- ❖ Shortages
- ❖ Soaring costs
- ❖ Increased complexity
- ❖ Heightened competition
- ❖ Technological changes
- ❖ Societal Concerns



Obstacles (Continued)

- ❖ Consumerism
- ❖ Ecology
- ❖ Quality of work

Results of NOT Controlling Obstacles

- ❖ Decreased Profits
- ❖ Increased manpower needs
- ❖ Cost overruns, schedule delays, and penalty occurring earlier and earlier
- ❖ An inability to cope with new technology
- ❖ R&D results too late to benefit existing product lines
- ❖ Temptation to make hasty decisions that prove to be costly



Results of NOT Controlling Obstacles

(Continued)

- ❖ Management insisting on earlier and greater return on investment
- ❖ Greater difficulty in establishing on-target objectives in real time
- ❖ Problems in relating cost to technical performance and scheduling during the execution of the project

Project Management Growth

- ❖ Technology increasing at an astounding rate
- ❖ More money invested in R&D
- ❖ More information available
- ❖ Shortening of project life cycles



Early Reasons For Failure

- ❖ There was no need for project management.
- ❖ Employees were not informed about how project management should work.
- ❖ Executives did not select the appropriate projects or project managers for the first few projects.



Early Reasons for Failure

(Continued)

- ❖ There was no attempt to explain the effect of the project management organizational structure on the wage and salary administration program.
- ❖ Employees were not convinced that executives were in total support of the change (to project management).



Integrative Responsibility

- ❖ Total accountability assumed by a single person
- ❖ Project rather than functional dedication
- ❖ A requirement for coordination across functional interfaces
- ❖ Proper utilization of integral planning and control



Advantages

- ❖ Easy adaptation to an ever-changing environment
- ❖ Ability to handle a multidisciplinary activity within a specified period of time
- ❖ Horizontal as well as vertical work flow
- ❖ Better orientation toward customer problems
- ❖ Easier identification of activity responsibilities
- ❖ A multidisciplinary decision-making process
- ❖ Innovation in organizational design

Life Cycle Phases for Project Management Maturity



Life Cycle Phases for Level 2 Project Management Maturity

Embryonic

- Recognize need
- Recognize benefits
- Recognize applications
- Recognize what must be done

Executive
Management
Acceptance

Maturity

Life Cycle Phases for Level 2 Project Management Maturity

Executive Management Acceptance

- Visible executive support
- Executive understanding of project management
- Project sponsorship
- Willingness to change way of doing business

**Line
Management
Acceptance**

Embry

Life Cycle Phases for Level 2 Project Management Maturity

Line Management Acceptance

- Line management support
- Line management commitment
- Line management education
- Willingness to release employees for project management training

Executive
Management
Acceptance

Maturity

Life Cycle Phases for Level 2 Project Management Maturity

Growth

- Development of a methodology
- Use of life cycle phases
- Commitment to planning
- Minimization of “creeping scope”
- Selection of a project tracking system

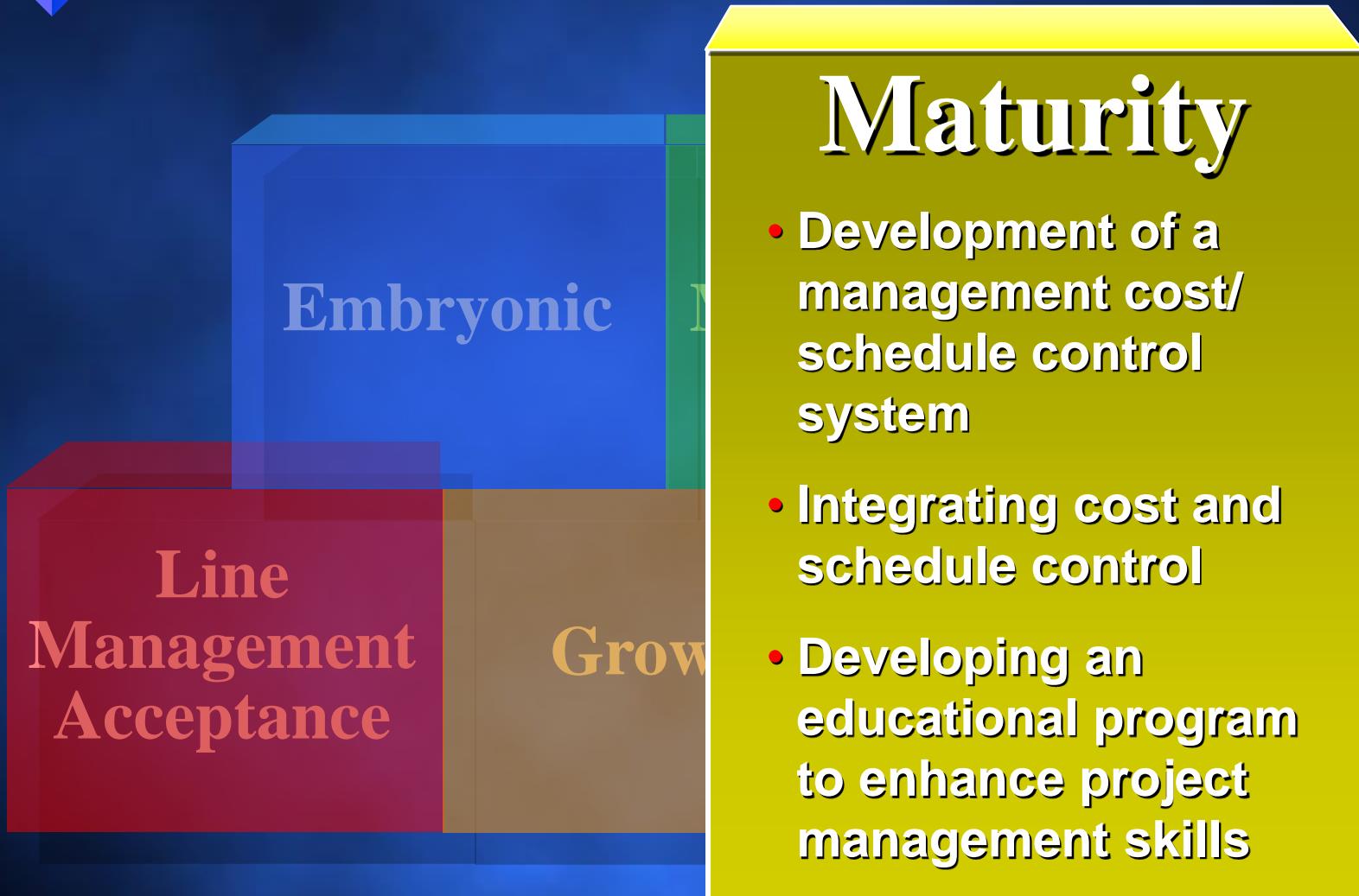
Line
Management
Acceptance

E

Excellence

Maturity

Life Cycle Phases for Level 2 Project Management Maturity

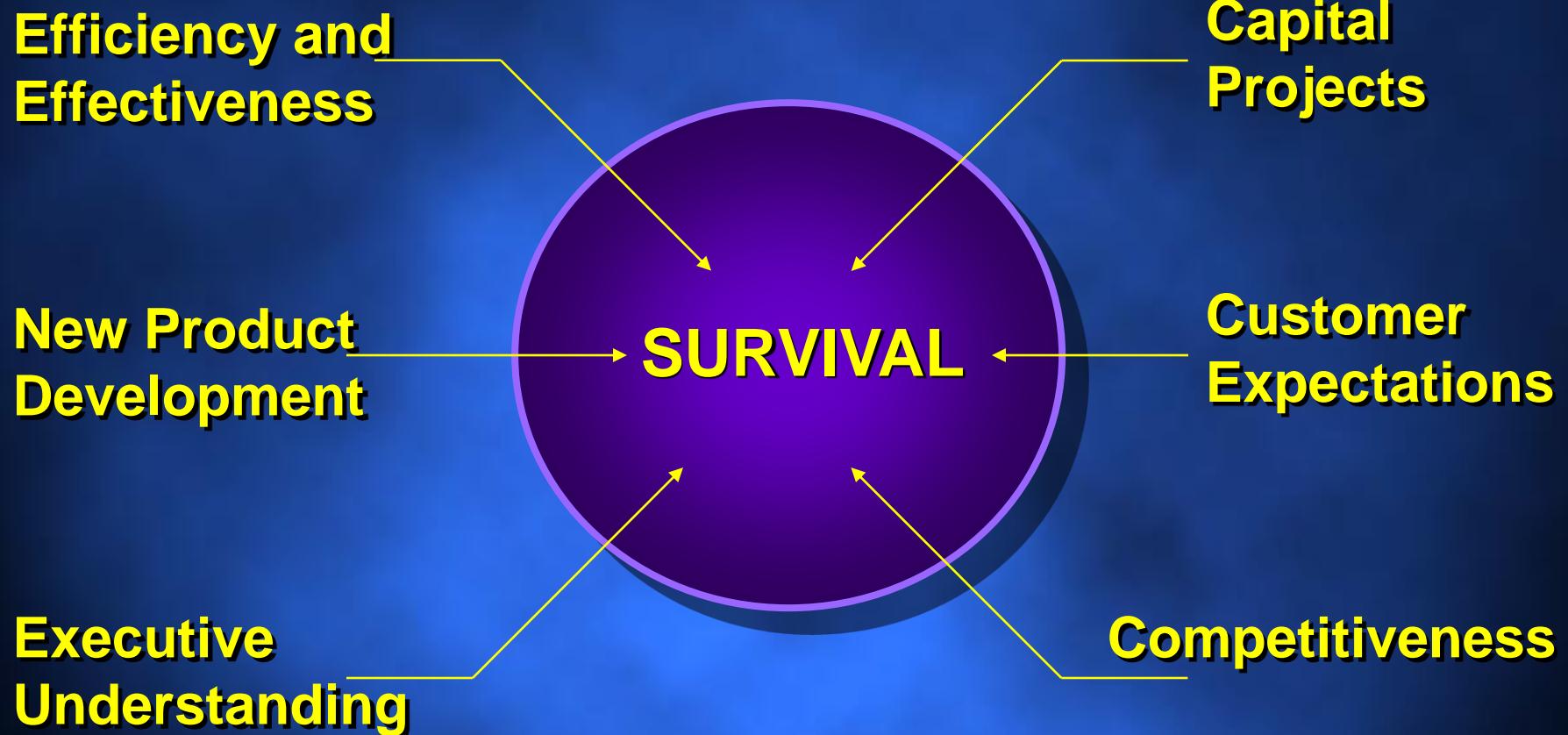




Driving Forces for Maturity

- ❖ Capital projects
- ❖ Customer expectations
- ❖ Competitiveness
- ❖ Executive understanding
- ❖ New product development
- ❖ Efficiency and effectiveness

The Components of Survival



Benefits Of Project Mgt.

Past View

- ❖ Project management will require more people and add to the overhead costs.
- ❖ Profitability may decrease.

Present View

- ❖ Project management allows us to accomplish more work in less time and with less people.
- ❖ Profitability will increase.

Benefits Of Project Mgt.

Past View

- ❖ Project management will increase the amount of scope changes.
- ❖ Project management creates organizational instability and increases conflicts.

Present View

- ❖ Project management will provide better control of scope changes.
- ❖ Project management makes the organization more efficient and effective.

Benefits Of Project Mgt.

Past View

- ❖ Project management is really “eye wash” for the customer’s benefit.
- ❖ Project management will create problems.

Present View

- ❖ Project management will allow us to work closer with our customers.
- ❖ Project management provides a means for problem solving.

Benefits Of Project Mgt.

Past View

- ❖ Only large projects need project management.
- ❖ Project management will increase quality problems.

Present View

- ❖ All projects will benefit from project management.
- ❖ Project management increases quality.

Benefits Of Project Mgt.

Past View

- ❖ Project management will create power and authority problems.
- ❖ Project management focuses on suboptimization by looking at only the project.

Present View

- ❖ Project management will reduce the majority of the power struggles.
- ❖ Project management allows people to make good company decisions.

Benefits Of Project Mgt.

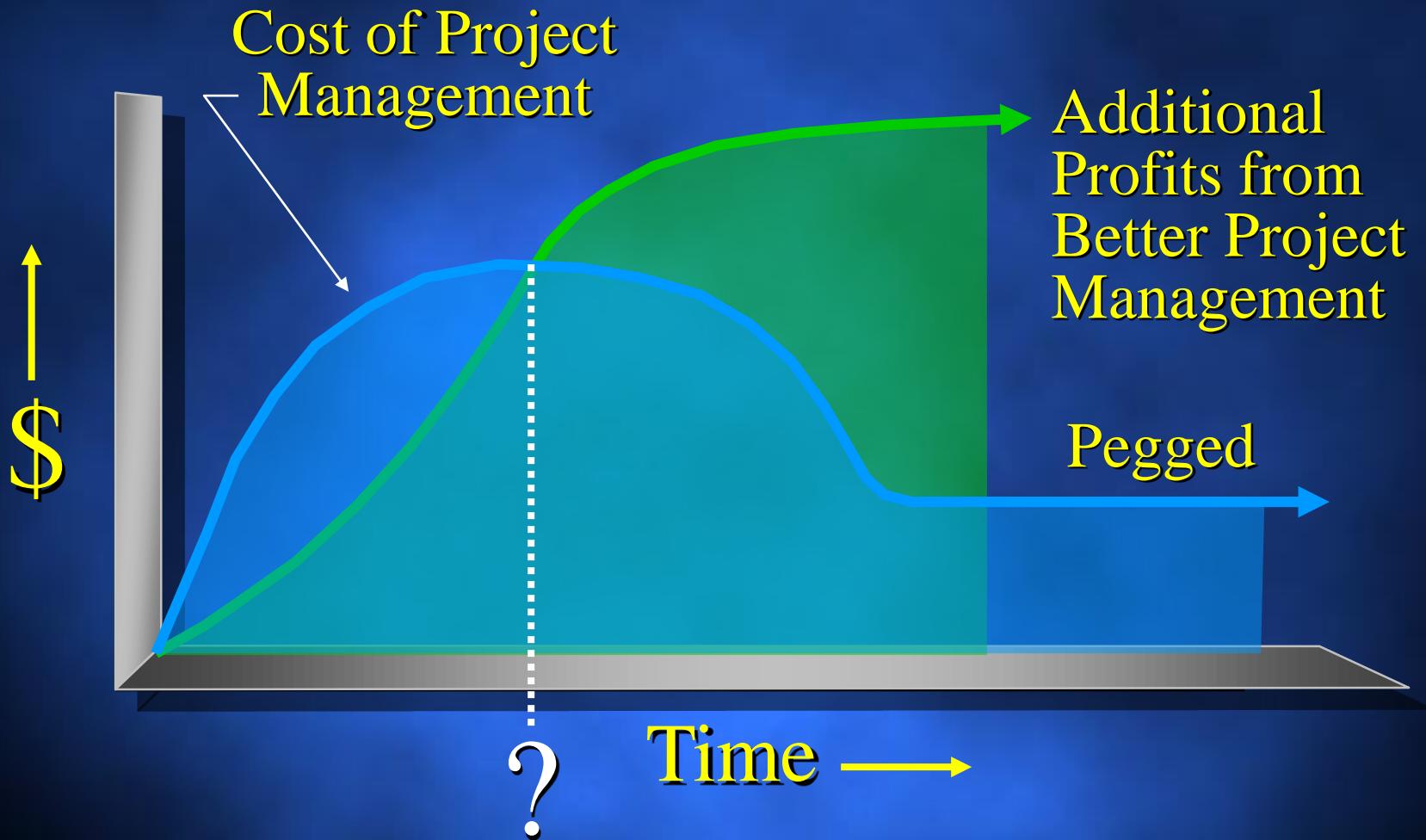
Past View

- ❖ Project management delivers products to a customer.
- ❖ The cost of project management may make us noncompetitive.

Present View

- ❖ Project management delivers solutions to a customer.
- ❖ Project management will increase our business.

Project Management Costs Versus Benefits



Industry Classification (By Project Management Utilization)

Project -Driven

- PM is a recognized profession
- Multiple career paths
- Income comes from projects

Present

Hybrid

- Production driven but with many projects
- Emphasis on new product develop.
- Short product life cycles
- Marketing-orient.
- Need for rapid develop. process

Past

Non- Project-Driven

- Very few projects
- Profitability from production
- Large brick walls
- Long life cycle products

Project
Management

Program
Management

Product
Management

From Hybrid to Project-Driven



- ❖ Entrance via project-driven divisions such as MIS and R&D
- ❖ Entrance via marketing, sales, engineering and R&D

Recessionary Effects

Characteristics					
Recession	Layoffs	R&D	Training	Solutions Sought	Results of the Recessions
1979-1983	Blue Collar	Eliminated	Eliminated	Short-Term	<ul style="list-style-type: none">• Return to status quo• No project management support• No allies for project management
1989-1993	White Collar	Focused	Focused	Long-Term	<ul style="list-style-type: none">• Change way of doing business• Risk management• Examine lessons learned

New Processes Supporting Project Management

1960-1985	1985	1990	1991-1992	1993	1994
No Allies	Total Quality Management	Concurrent Engineering	Empowerment and Self-Directed Teams	Re-Engineering	Life Cycle Costing

Increasing Support

New Processes Supporting Project Management (Continued)

1995	1996	1997-1998	1999	2000
Scope Change Control	Risk Management	Project Offices	Co-Located Teams	Multi-National Teams

Increasing Support

New Processes Supporting Project Management (Continued)

2001	2002	2003	2004	2005
Maturity Models	Strategic Planning For Project Management	Intranet Status Reports	Capacity Planning Models	Six Sigma Project Mgt

Increasing Support

New Processes Supporting Project Management (Continued)

2006	2007	2008	2009
Virtual Project Teams	Lean Project Teams	Best Practice Libraries	Capacity Planning Models

Increasing Support



Definitions: Systems

- ❖ Air Force
 - A composite of equipment, skills, and techniques capable of performing and/or supporting an operational role. A complete system includes related facilities, equipment, material services, and personnel required for its operation to the degree that it can be considered as a self- sufficient unit in its intended operational and/or support environment.



Definitions: Systems

(continued)

- ❖ NASA
 - One of the principal functioning entities comprising the project hardware within a project or program. The meaning may vary to suit a particular project or program area. Ordinarily, a “system” is the first major subdivision of project work (spacecraft systems, launch vehicle systems).



Definitions: Programs

- ❖ **Air Force**
 - The integrated, time-phased tasks necessary to accomplish a particular purpose.
- ❖ **NASA**
 - A relative series of undertakings that continue over a period of time (normally years) and that are designed to accomplish a broad, scientific or technological goal in the NASA long-range plan (lunar and planetary exploration, manned spacecraft systems).



Definitions: Projects

- ❖ NASA/Air Force
 - A project is within a program as an undertaking with a scheduled beginning and end, and which normally involves some primary purpose.



KINDS OF PROJECTS

Once a group of tasks is selected and considered to be a project the next step is to define the kinds of projects encountered. There are four categories of projects:

INDIVIDUAL PROJECTS

Short-duration projects normally assigned to a single individual who may be acting as a project manager and/or a functional manager.

STAFF PROJECTS

These projects that can be accomplished by one organizational unit, say a department. Staff (or a task force) is developed from each section involved. This works best when one functional unit is involved.



SPECIAL PROJECTS

Very often special projects occur which require that certain primary functions and/or authority be assigned temporarily to other individuals or unit.

**These works best for short-duration projects.
Long-term projects can lead to severe conflicts.**

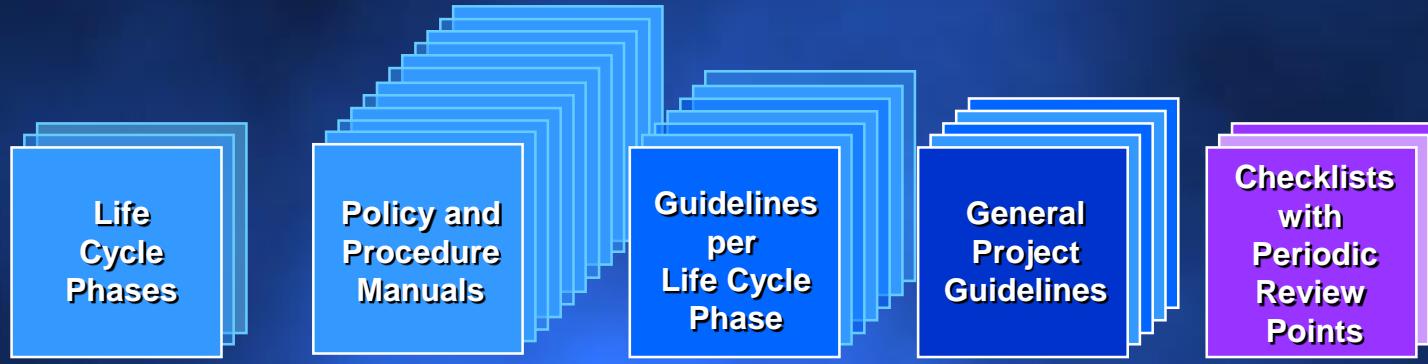
MATRIX OR AGGREGATE PROJECTS

These projects require specific (or specialized) input from a large number of functional (or business) units and usually control vast resources.

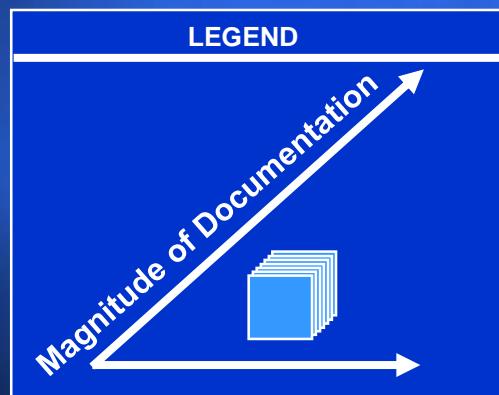
Successes Vs. Failures



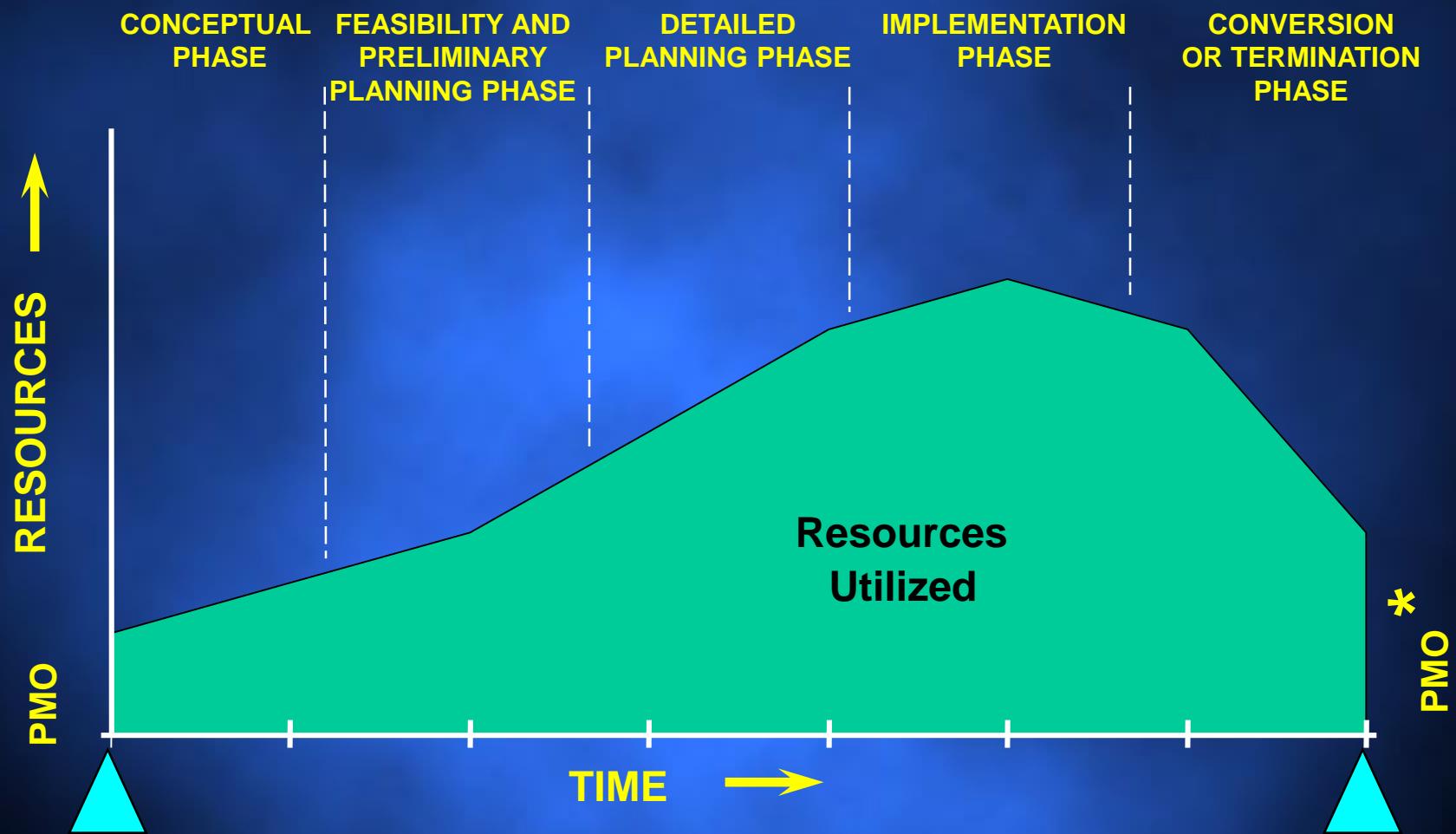
Evolution of Policies, Procedures and Guidelines



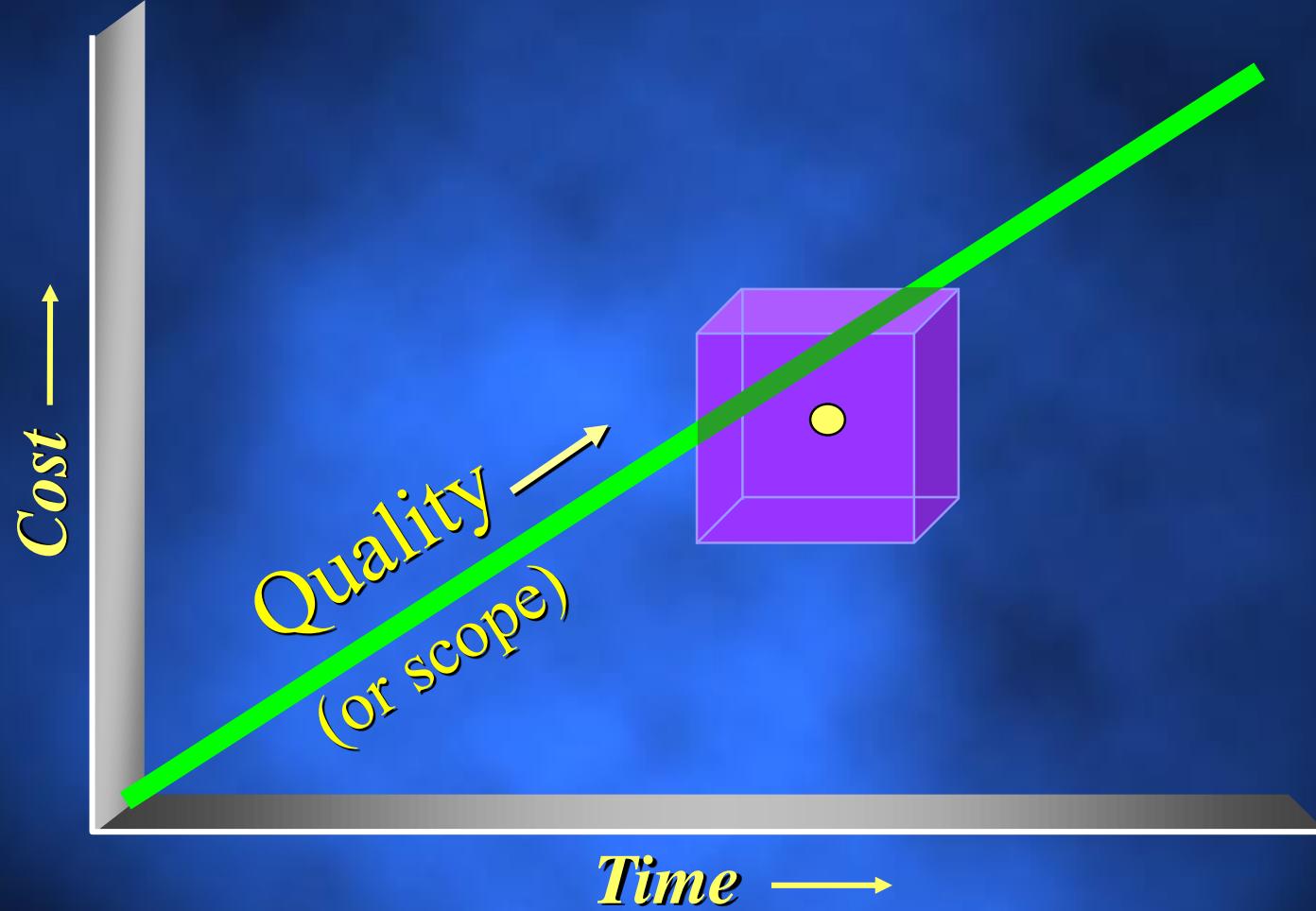
1970s	Early 1980s	Mid 1980s	Late 1980s	1990s
CONVENTIONAL PROJECT MANAGEMENT				Project Management with Concurrent Engineering



DEFINITION OF A PROJECT LIFE CYCLE



Success: Point Or Cube?



The Definition Of Success



Success

❖ **Definition of Success**

– Primary Factors

- ◆ **Within Time**
- ◆ **Within Cost**
- ◆ **Within Quality**
- ◆ **Accepted by The Customer**

Success

Secondary Factors:

- ◆ Customer Reference
- ◆ Follow-on Work
- ◆ Financial Success
- ◆ Technical Superiority
- ◆ Strategic Alignment
- ◆ Regulatory Agency Relations
- ◆ Health and Safety
- ◆ Environmental Protection
- ◆ Corporate Reputation
- ◆ Employee Alignment
- ◆ Ethical conduct



Success

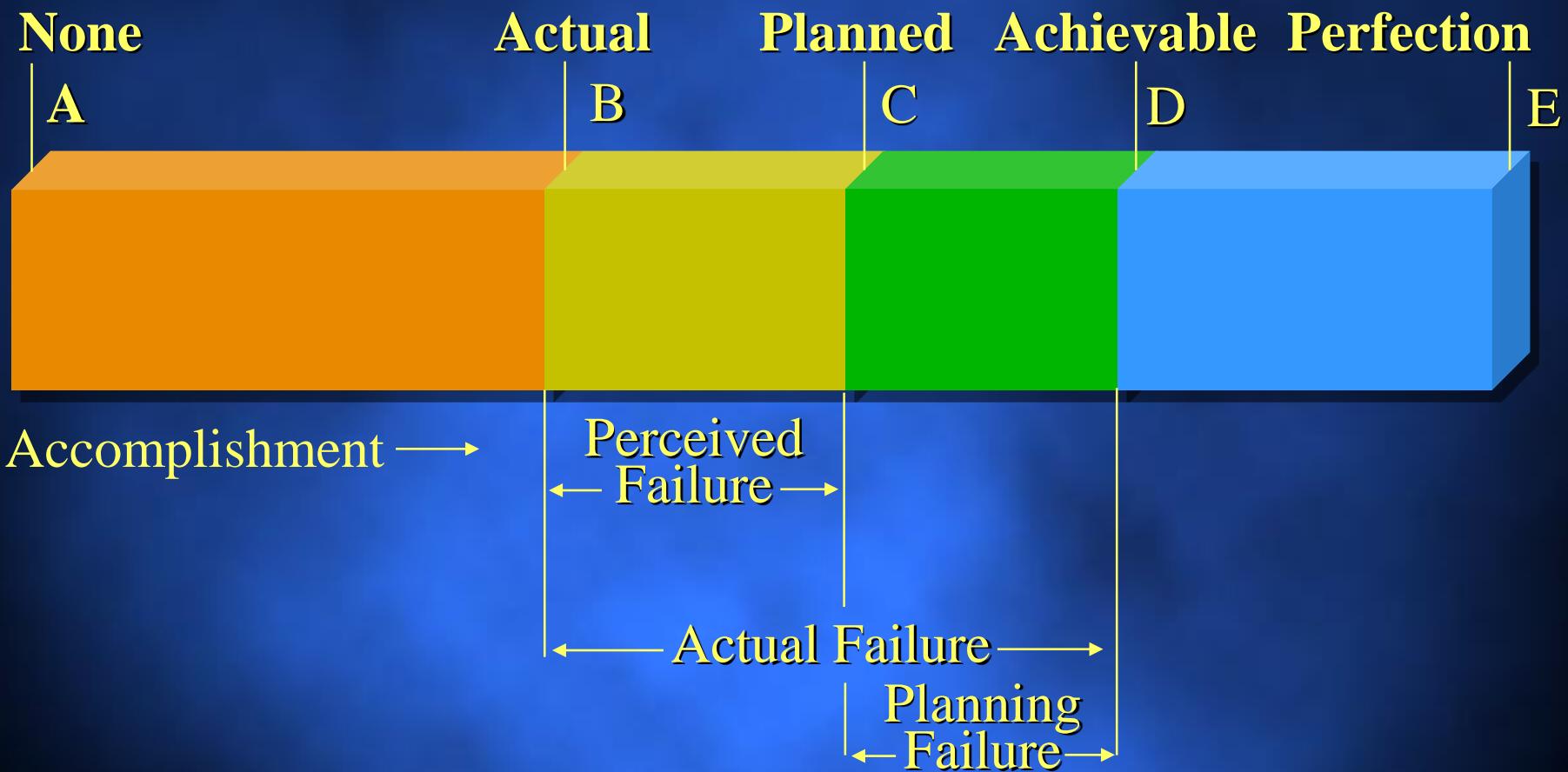
- ❖ Critical Success Factors (CSFs)
[Focuses on the Deliverables]
- ❖ Key Performance Indicators (KPIs)
[Focuses on the Execution Metrics of the Process]



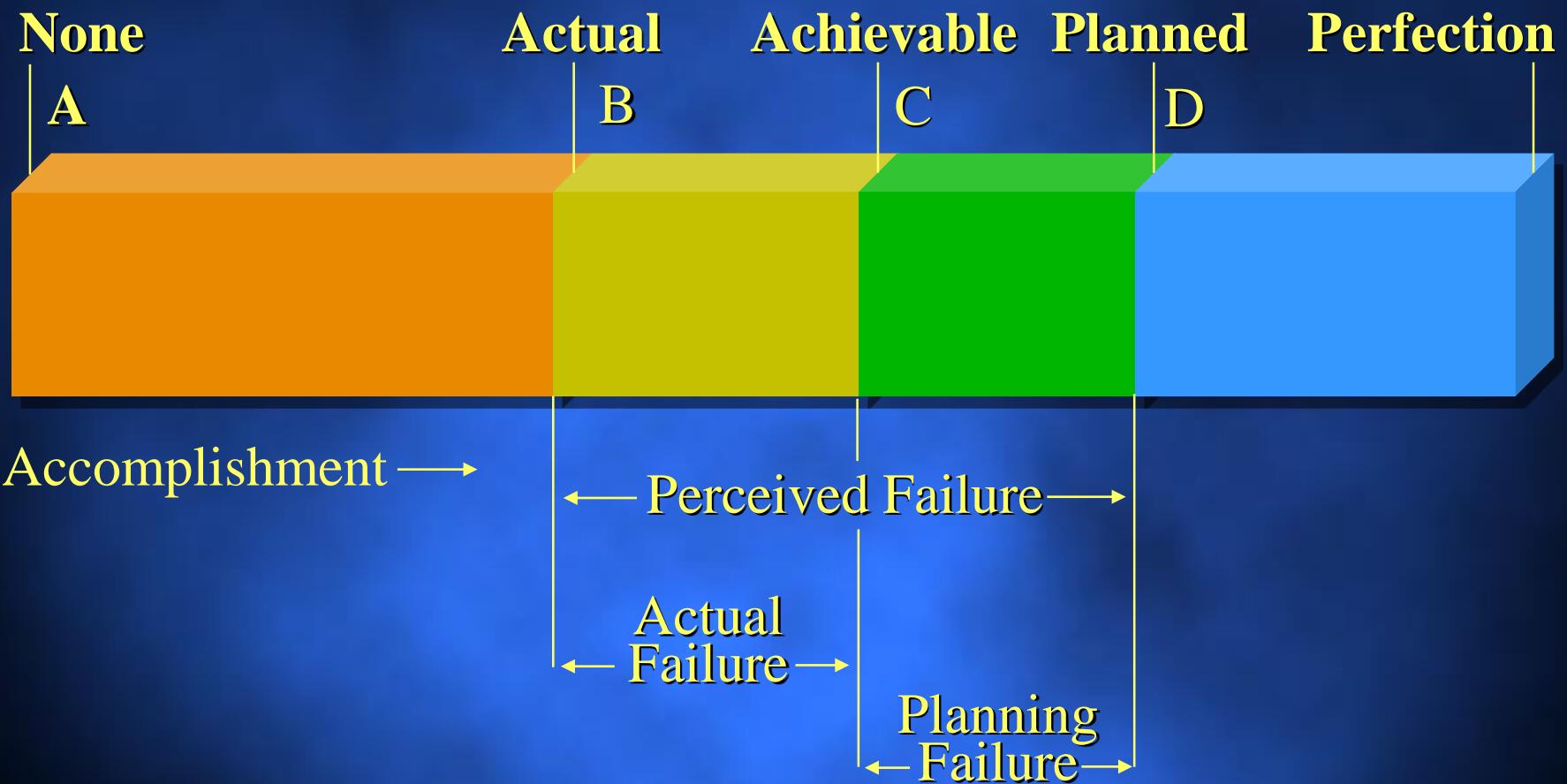
Key Performance Indicators

These are shared learning topics which allow us to maximize what we do right and correct what we do wrong.

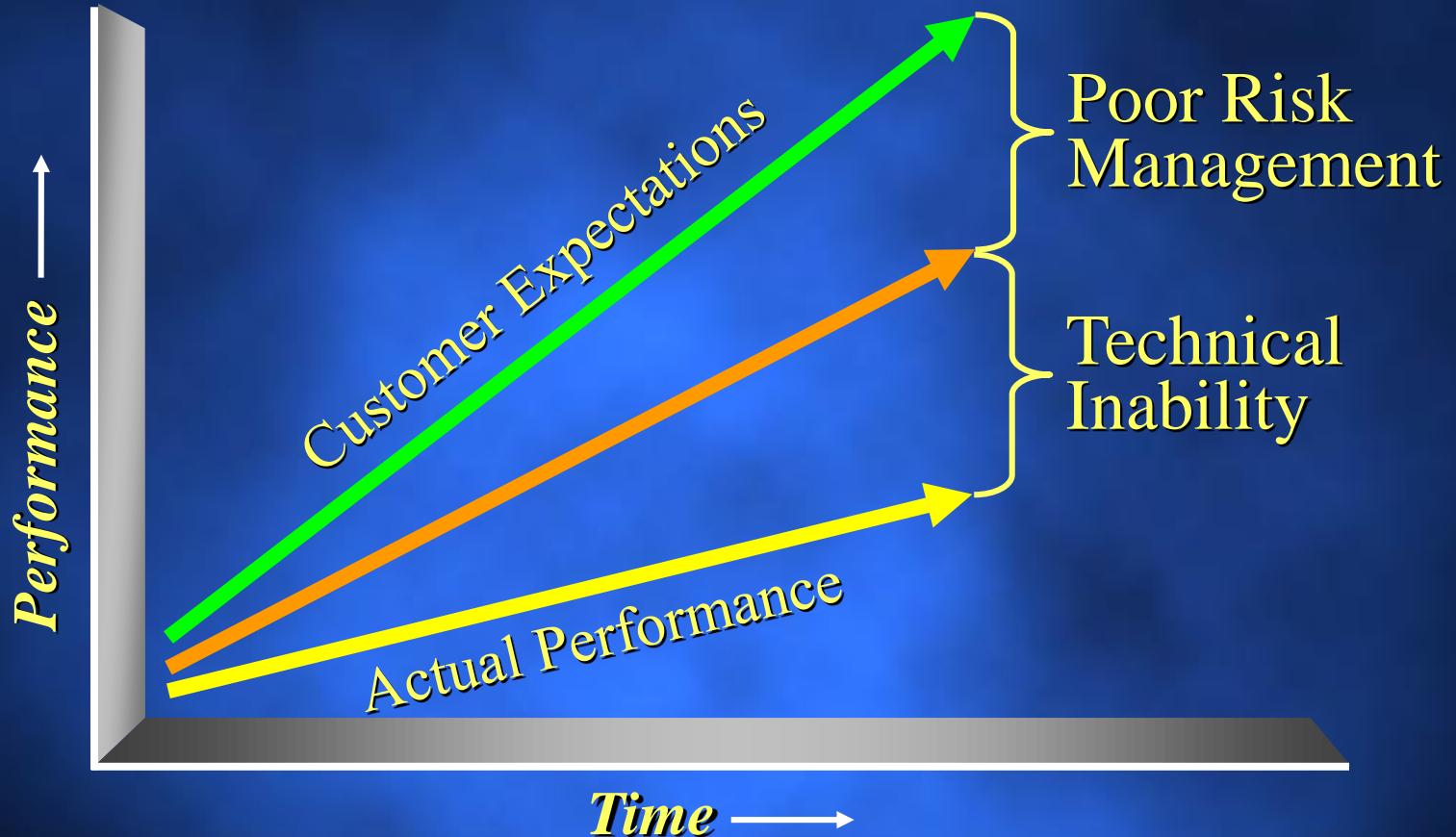
Components of Failure



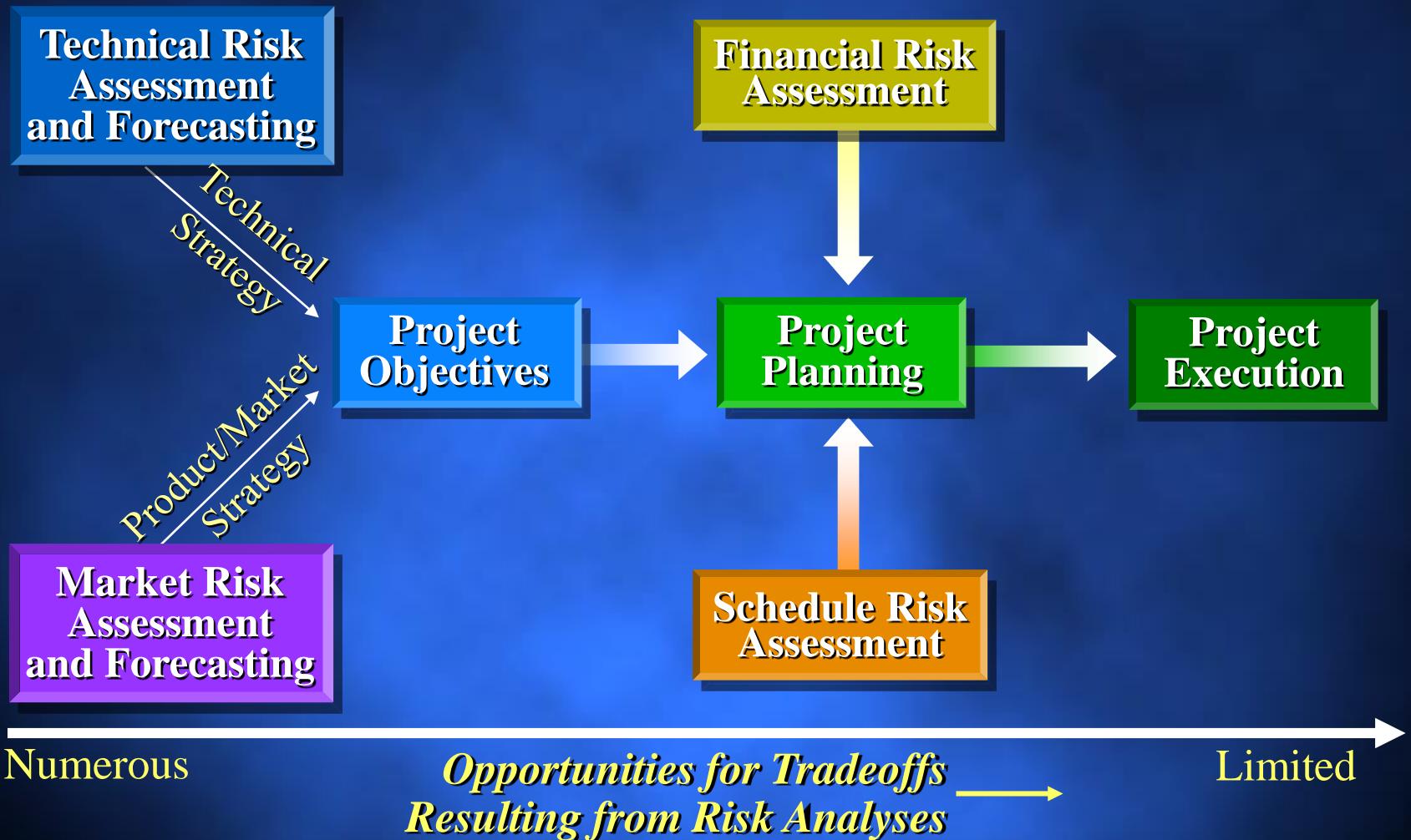
Components of Failure



Risk Planning



Mitigation Strategies Available





The starting point in the development of any project management methodology is the implementation of a stage-gate process.

Stages

- ❖ Groups of series or parallel activities (based upon the risks of the project)
- ❖ Managed by cross-functional teams
- ❖ To reach a predetermined deliverable established by management



Gates

- ❖ Structured decision points at the end of each stage
- ❖ Number of gates must be limited



Gatekeepers

- ❖ Individuals (i.e. sponsors) or groups of individuals assigned by senior management
- ❖ Empowered to enforce the structured process (including change management)
- ❖ Authorized to evaluate performance and make decisions
- ❖ And willing to provide the team necessary technical and business information



Gatekeeper's decisions

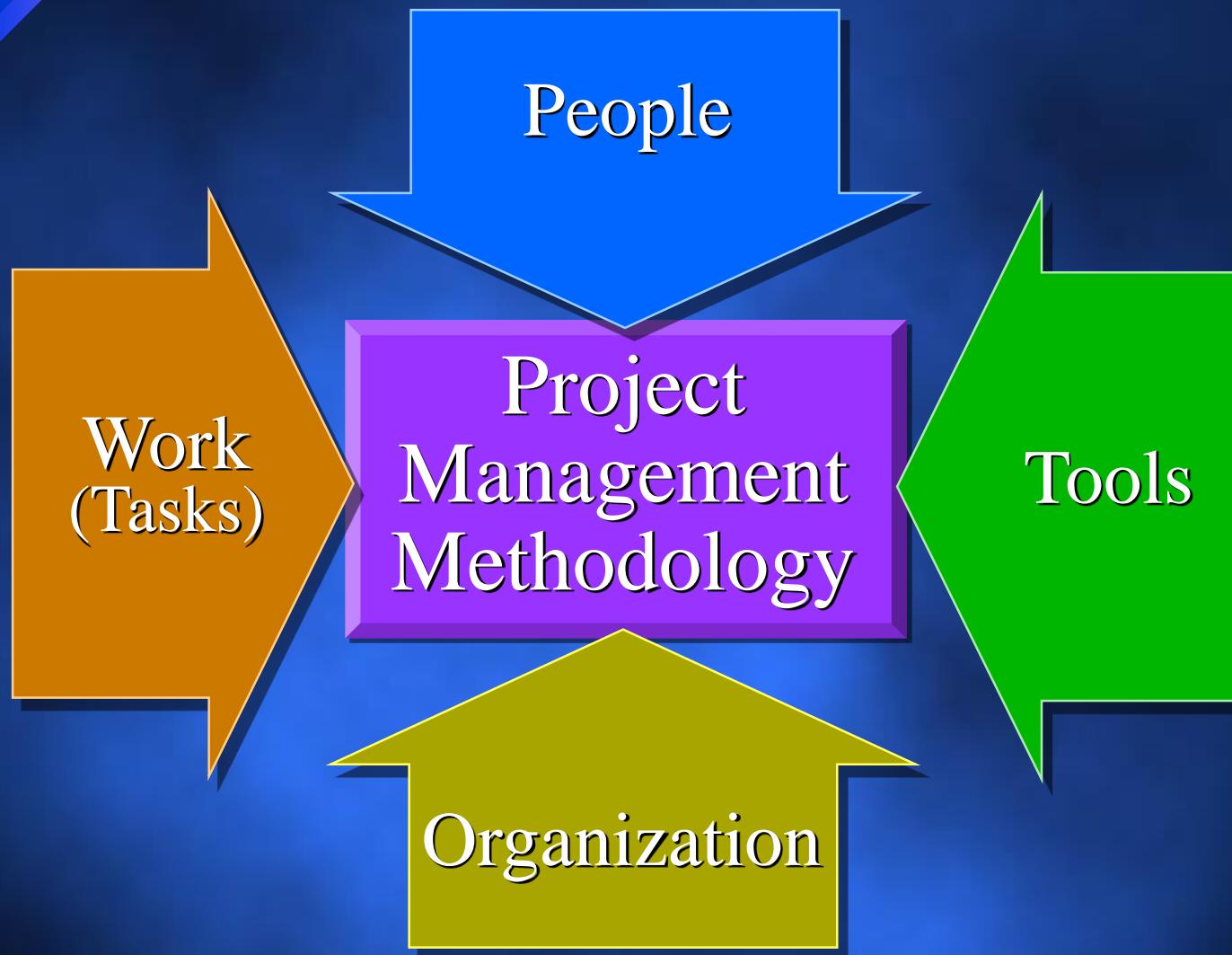
- ❖ Proceed to next gate with the original objectives
- ❖ Proceed to the next gate with revised objectives
- ❖ Delay making a gate decision until further information is obtained
- ❖ Terminate the project



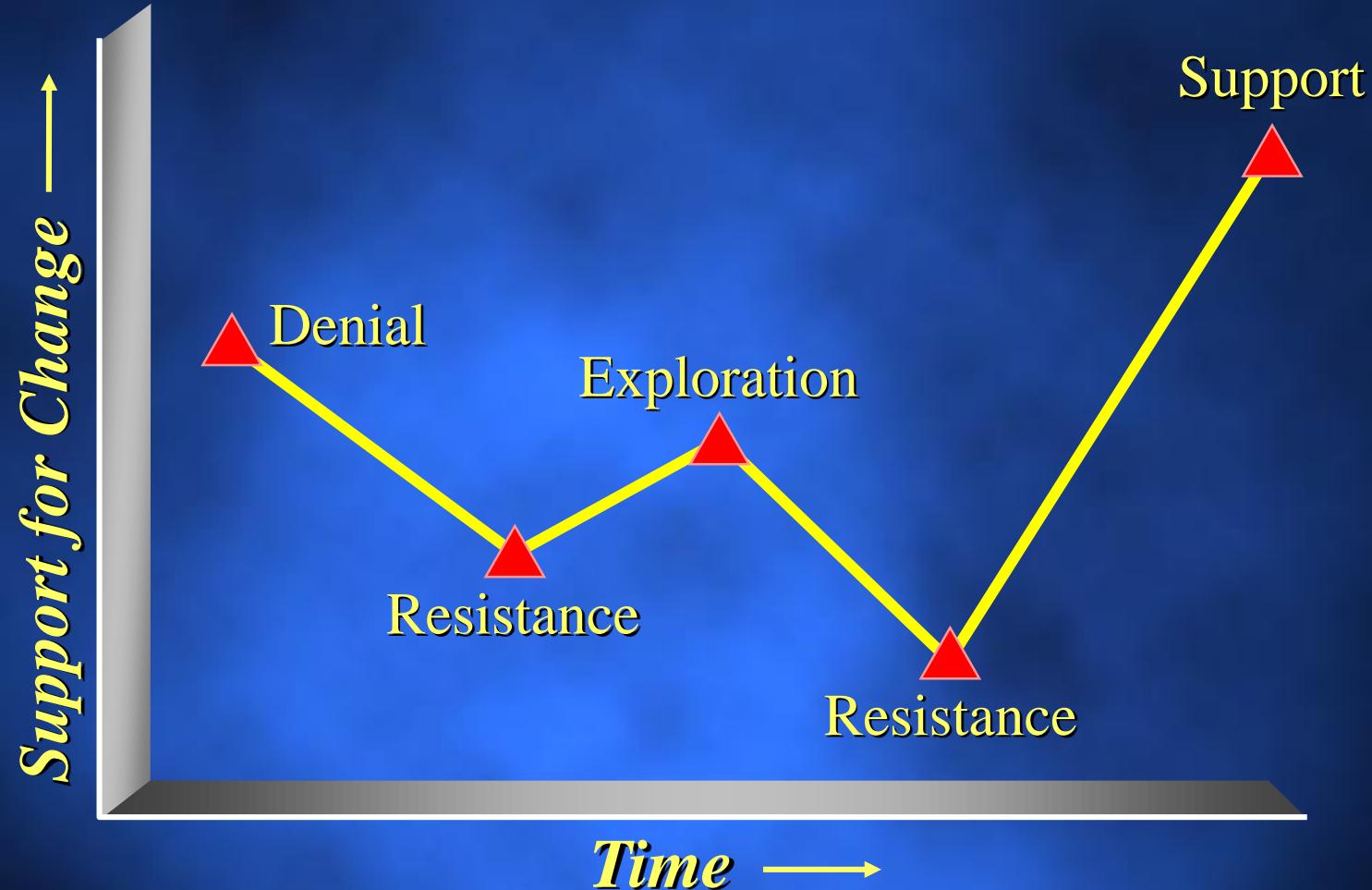
Stage-Gate Failures

- ❖ **Assigning gatekeepers and not empowering them to make decisions**
- ❖ **Assigning gatekeepers who are afraid to terminate a project**
- ❖ **Failure to provide the team with information critical to gate reviews**
- ❖ **Allowing the team to focus more on the gates than on the stages**

Methodology Inputs



Change Process





Types of Cultures

- ❖ Cooperative
- ❖ Non-cooperative
- ❖ Isolated (large companies)
- ❖ Fragmented (multinational)

Integrated Processes for The 21st Century

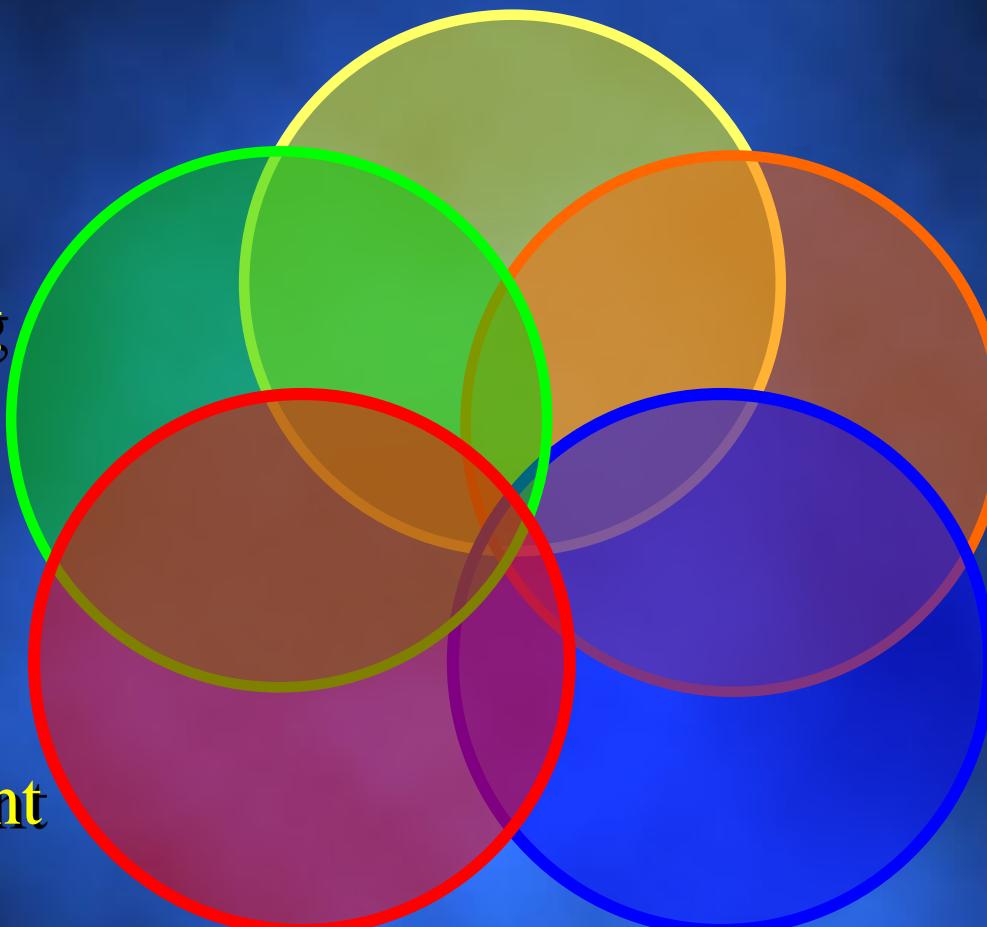
Project Management

Concurrent
Engineering

Total Quality
Management

Change
Management

Risk
Management





Multi-project Management

- ❖ Are the project objectives the same?
 - For the good of the project?
 - For the good of the company?
- ❖ Is there a distinction between large and small projects?
- ❖ How do we handle conflicting priorities?
 - Critical versus critical projects
 - Critical versus non-critical projects
 - Non-critical versus non-critical projects



Chapter Three

Organizational Structures

Restructuring Necessity

- ❖ The technology revolution (complexity and variety of products, new materials and processes, and the effects of massive research)
- ❖ Competition and the profit squeeze (saturated markets, inflation of wage and material costs, and production efficiency)
- ❖ The high cost of marketing
- ❖ The unpredictability of consumer demands (due to high income, wide range of choices available, and shifting tastes)



Traditional Weaknesses

- ❖ Management is satisfied with its technical skills, but projects are not meeting time, cost, and other project requirements.
- ❖ There is a high commitment to getting project work done, but great fluctuations in how well performance specifications are met.
- ❖ Highly talented specialists involved in the project feel exploited and misused.

Traditional Weaknesses

(Continued)

- ❖ Particular technical groups or individuals constantly blame each other for failure to meet specifications or delivery dates.
- ❖ Projects are on time and to specifications, but groups and individuals aren't satisfied with the achievement.



Questions

- ❖ To what extent does the task of organization call for close control if it is to be performed efficiently?
- ❖ What are the needs and attitudes of the people performing the tasks? What are the likely effects of control mechanisms on their motivation and performance?
- ❖ What are the natural social groupings with which people identify themselves? To what extent are satisfying social relationships important in relation to motivation and performance?



Questions *(continued)*

- ❖ **What aspect of the organization's activities needs to be closely integrated if the overall task is to be achieved?**
- ❖ **What organizational measures can be developed that will provide an appropriate measure of control and integration of work activities, while at the same time meeting the needs of people and providing adequate motivation?**



Questions *(continued)*

- ❖ **What environmental changes are likely to affect the future trend of company operations? What organizational measures can be taken to insure that the enterprise responds to these effectively?**

Classical Structure

Advantages

- ❖ Easier budgeting and cost control are possible.
- ❖ Better technical control is possible.
 - Specialists can be grouped to share knowledge and responsibility.
 - Personnel can be used on many different projects.
 - All projects will benefit from the most advanced technology (better utilization of scarce personnel).
- ❖ It provides flexibility in the use of manpower.



Advantages (Continued)

- ❖ It provides a broad manpower base to work with.
- ❖ It provides continuity in the functional disciplines; policies, procedures, and lines of responsibility are easily defined and understandable.
- ❖ It readily admits mass production activities within established specifications.



Advantages (Continued)

- ❖ It provides good control over personnel, since each employee has one and only one person to report to.
- ❖ Communication channels are vertical and well established.
- ❖ Quick reaction capability exists, but may be dependent upon the priorities of the functional managers.

Classical Structure

Disadvantages

- ❖ No one individual is directly responsible for the total project (i.e., no formal authority; committee solutions).
- ❖ It does not provide the project-oriented emphasis necessary to accomplish the project tasks.
- ❖ Coordination becomes complex, and additional lead time is required for approval of decisions.



Disadvantages (Continued)

- ❖ Decisions normally favor the strongest functional groups.
- ❖ There is no customer focal point.
- ❖ Response to customer needs is slow.
- ❖ There is difficulty in pinpointing responsibility; this is the result of little or no direct project reporting, very little project-oriented planning, and no project authority.



Disadvantages *(Continued)*

- ❖ Motivation and innovation are decreased.
- ❖ Ideas tend to be functionally oriented with little regard for ongoing projects.



Functional Weaknesses

- ❖ Functional organizations tend to emphasize the separate functional elements at the expense of the whole organization.
- ❖ Under functional departmentation there is no group that effectively integrates the various functions of an organization and monitors them from the “big picture standpoint.”
- ❖ Functional organizations do not tend to develop “general managers.”

Functional Weaknesses

(Continued)

- ❖ Functional organizations emphasize functional relationships based on the vertical organizational hierarchy.
- ❖ Functional organizations tend to fragment other management processes.
- ❖ Functional organizations develop a strong resistance to change.

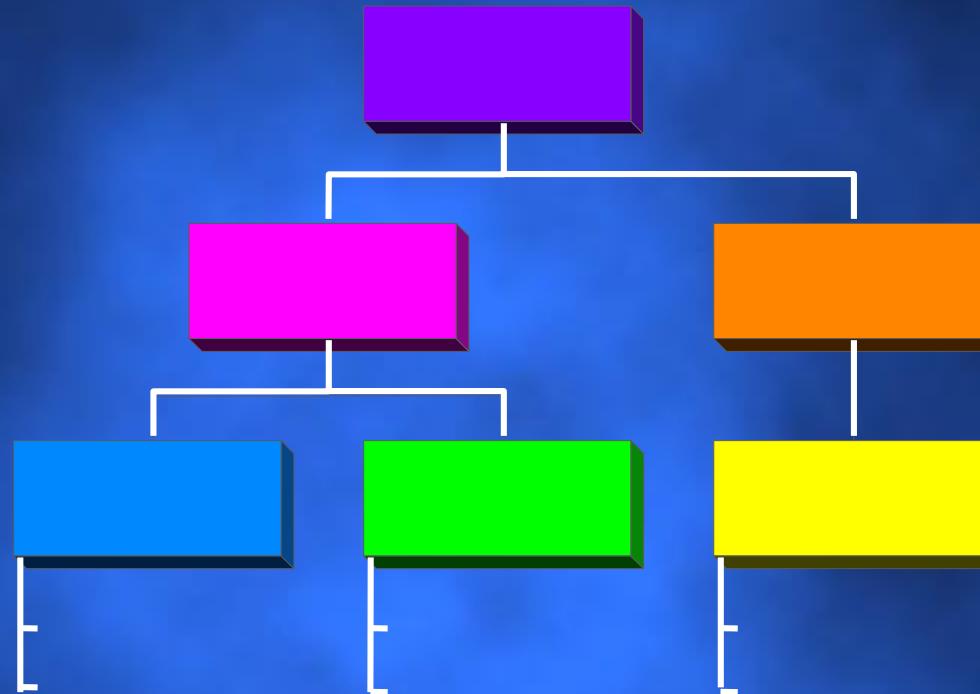
Functional Weaknesses

(Continued)

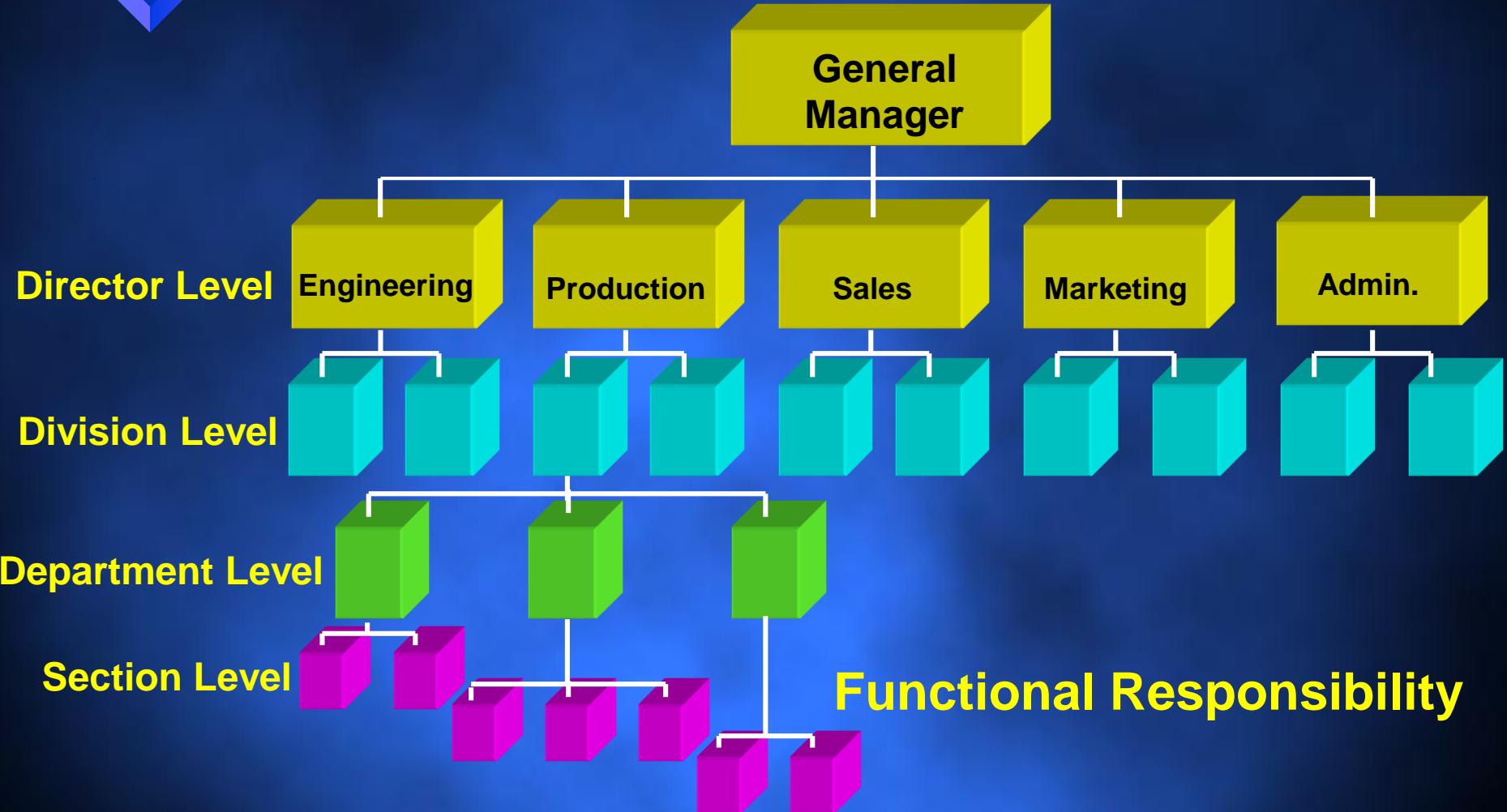
- ❖ Functional segregation through the formal organization process encourages conflict among the various functions.
- ❖ The emphasis on the various operation functions focuses attention on the internal aspects and relations of the company to the detriment of its external relations.
- ❖ Functional organizations tend to be closed systems.



Which Structure Is Best For Project Management?

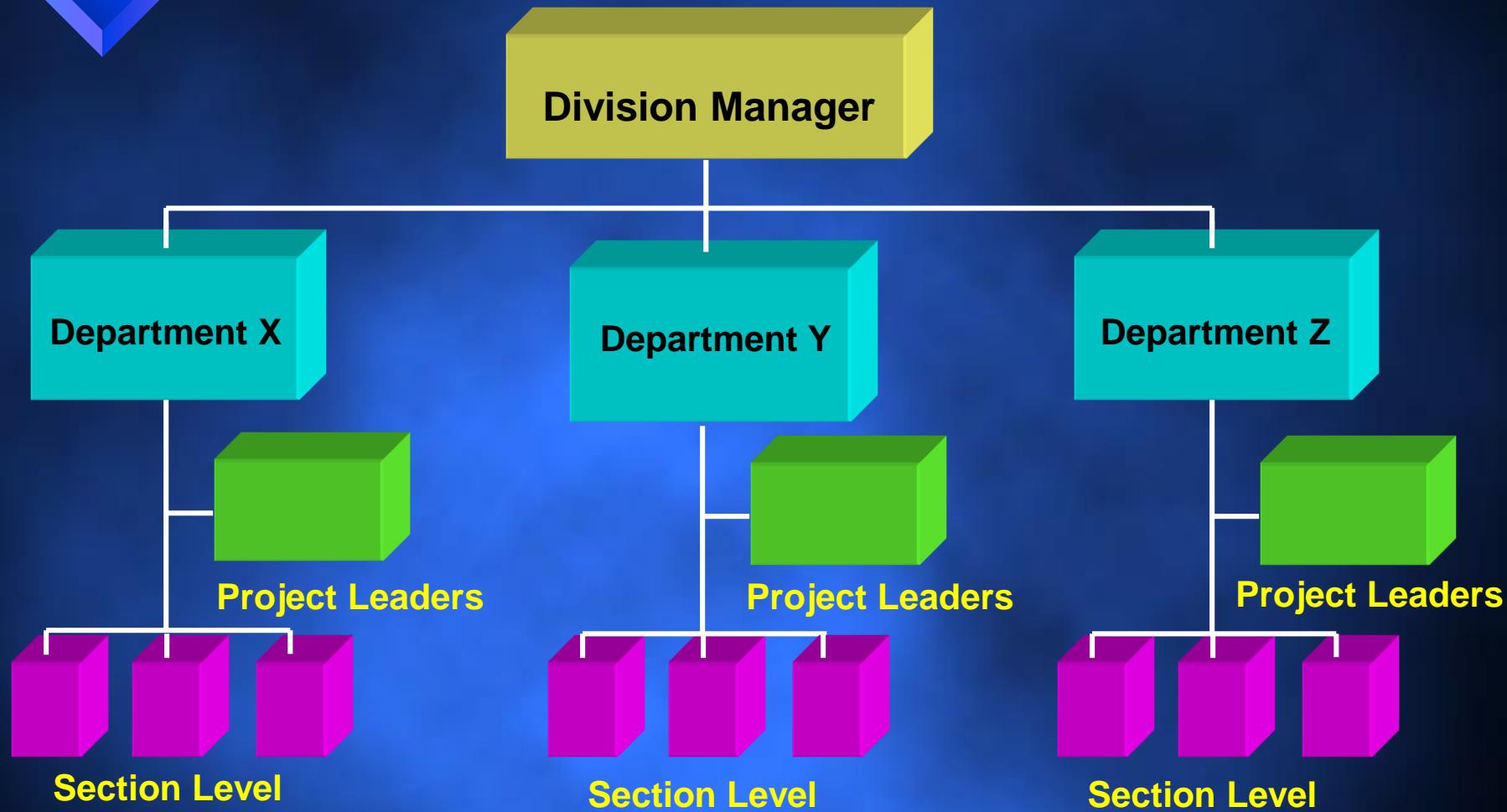


The Classical Management Structure

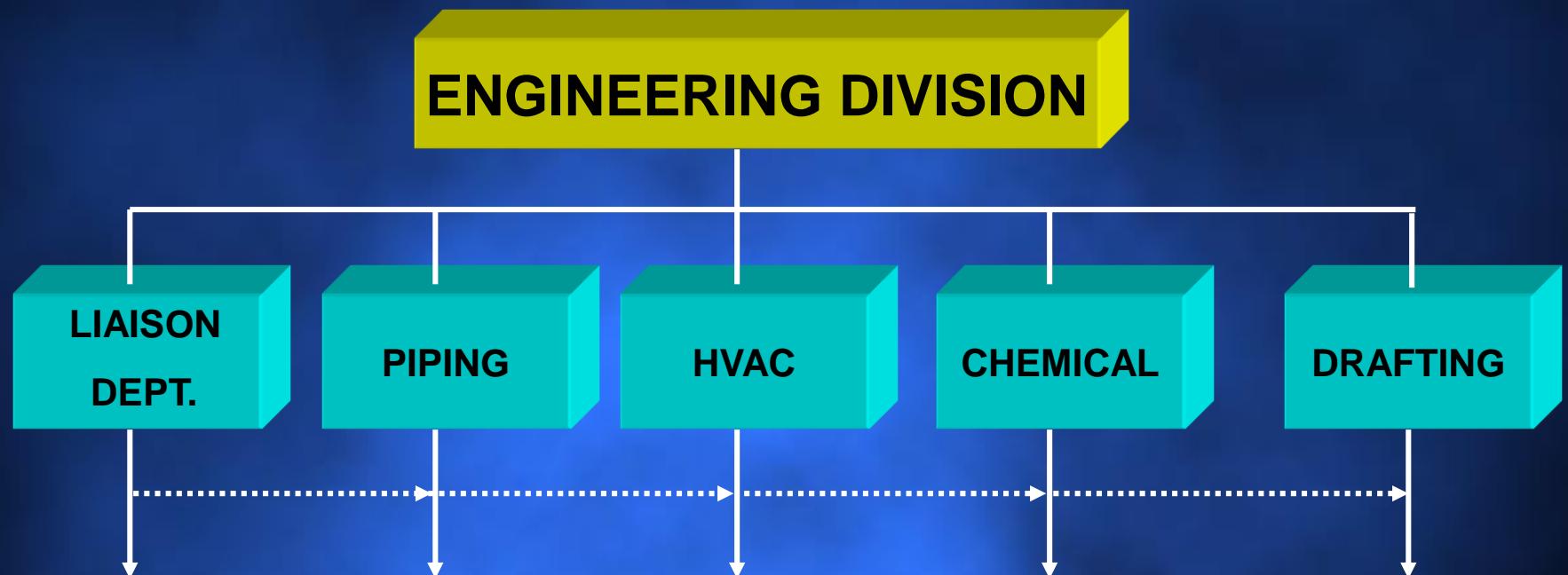




Departmental Project Management



Project Expeditor

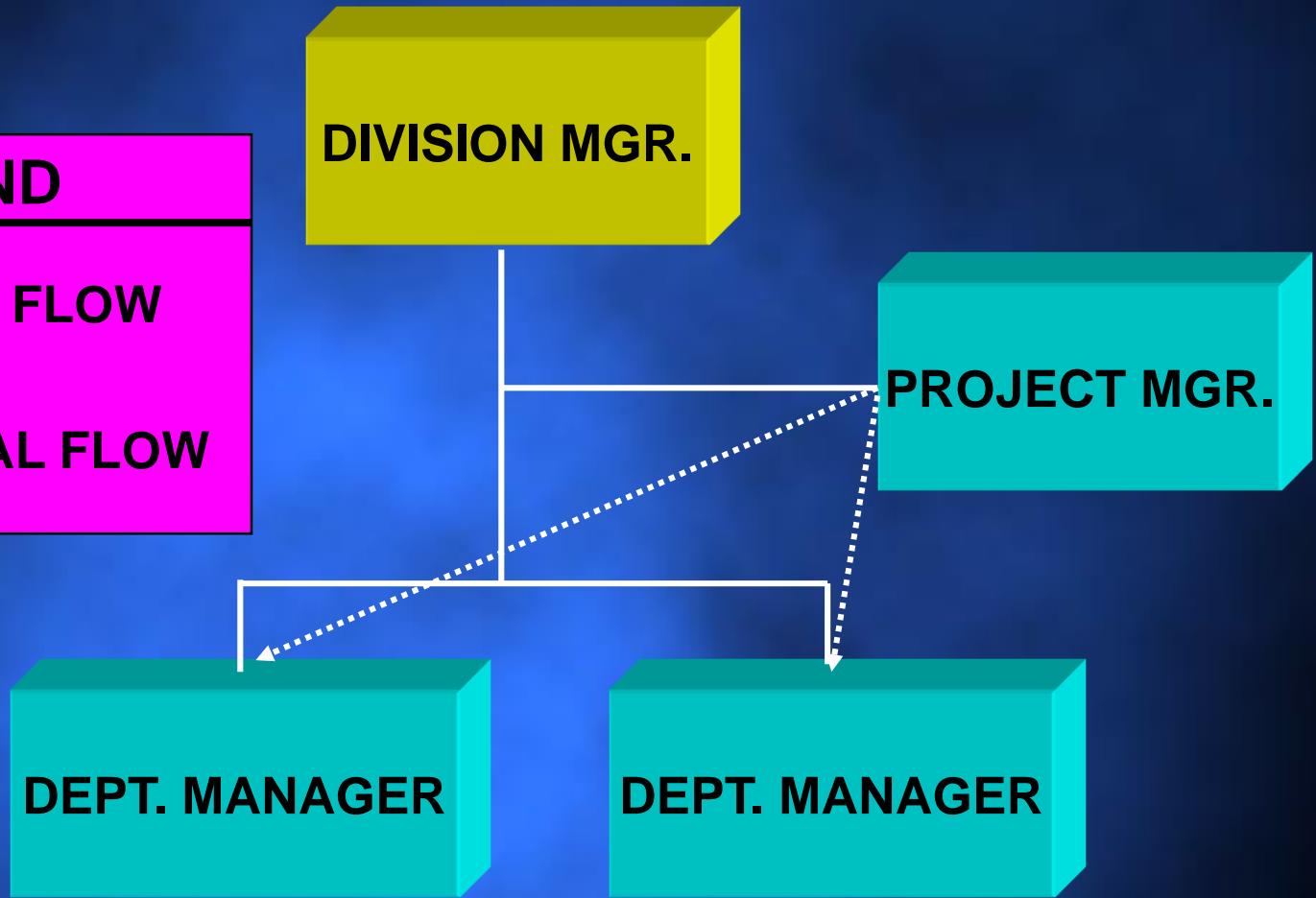
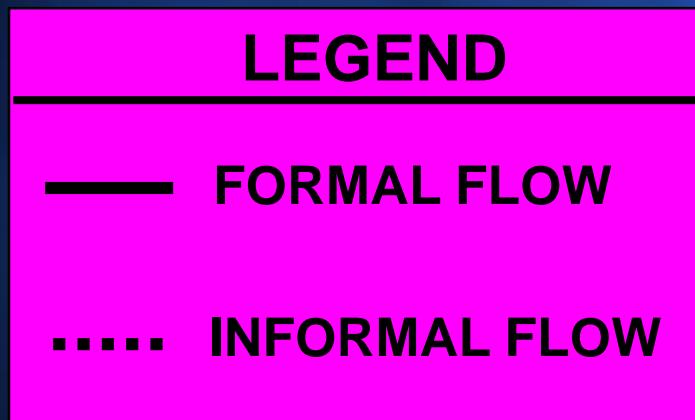


legend

→ Formal authority / reporting flow

.....→ Informal authority / reporting flow

Project Coordinator

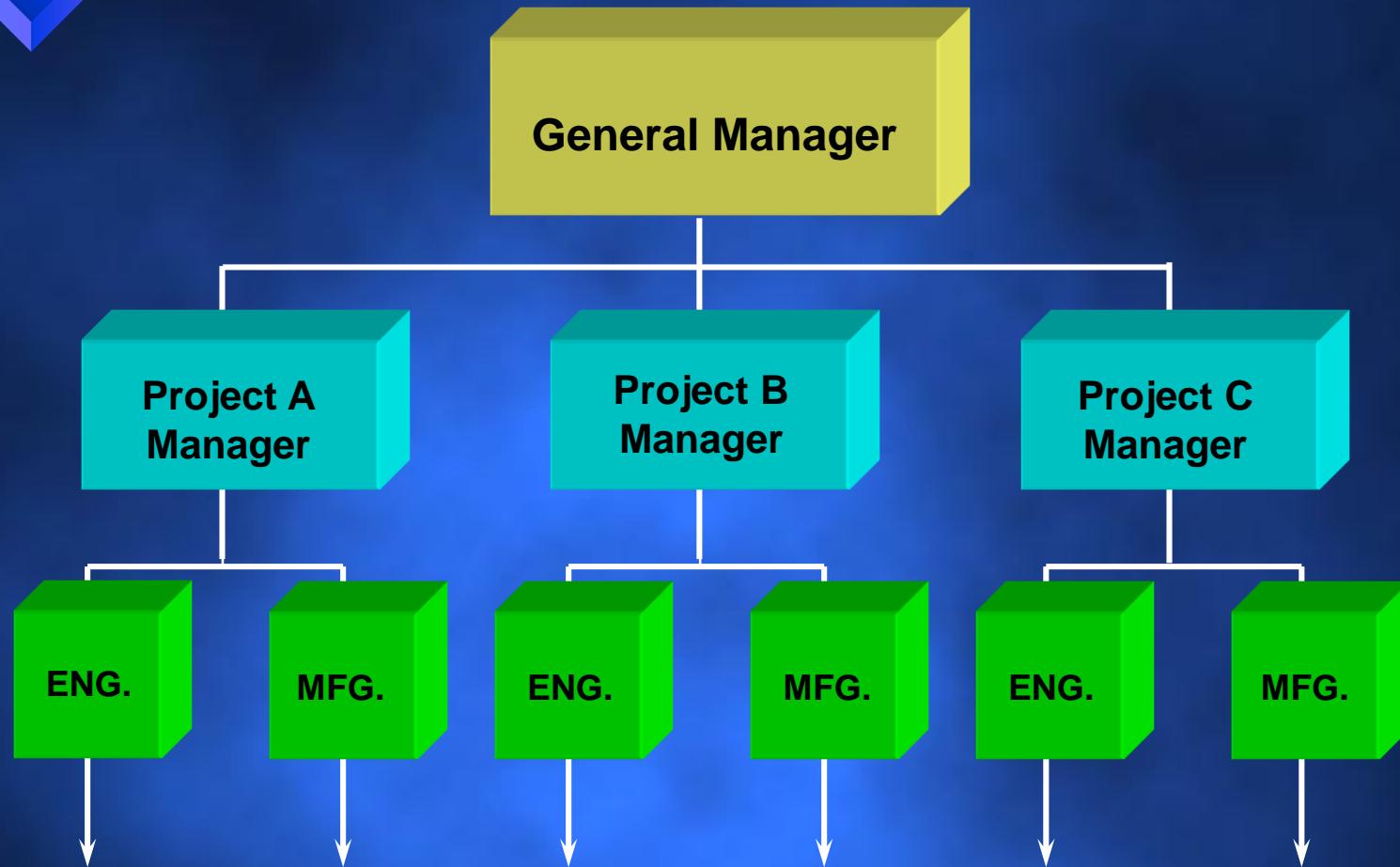


Project Coordinator Weaknesses

- ❖ Upper-level management was not ready to cope with the problems arising from shared authority.
- ❖ Upper-level management was reluctant to relinquish any of its power and authority to project managers.
- ❖ Line-staff project managers who reported to a division head did not have any authority or control over those portions of a project in other divisions; that is, the project manager in the engineering division could not direct activities in the manufacturing division.



Pure Project Structure



Projectized Structure

Advantages

- ❖ It provides complete line authority over the project (i.e., strong control through a single project authority).
- ❖ The project participants work directly for the project manager. Unprofitable product lines are easily identified and can be eliminated.
- ❖ There are strong communications channels.
- ❖ Staffs can maintain expertise on a given project without sharing key personnel.
- ❖ Very rapid reaction time is provided.



Advantages (Continued)

- ❖ Personnel demonstrate loyalty to the project; better morale with product identification.
- ❖ A focal point develops for out-of-company customer relations.
- ❖ There is flexibility in determining time (schedule), cost, and performance trade-offs.
- ❖ Interface management becomes easier as unit size is decreased.
- ❖ Upper-level management maintains more free time for executive decision making.

Projectized Structure

Disadvantages

- ❖ Cost of maintaining this form in a multi-product company would be prohibitive due to duplication of effort, facilities, and personnel; inefficient usage.
- ❖ There exists a tendency to retain personnel on a project long after they are needed. Upper-level management must balance workloads as projects start up and are phased out.



Disadvantages (Continued)

- ❖ Technology suffers because, without strong functional groups, outlook of the future to improve company's capabilities for new programs would be hampered (i.e., no perpetuation of technology).
- ❖ Control of functional (i.e., organizational) specialists requires top-level coordination.
- ❖ There is a lack of opportunities for technical interchange between projects.
- ❖ There is a lack of career continuity and opportunities for project personnel.



Matrix Development

- ❖ Participants must spend full time on the project; this ensures a degree of loyalty.
- ❖ Horizontal as well as vertical channels must exist for making commitments.
- ❖ There must be quick and effective methods for conflict resolution.
- ❖ There must be good communication channels and free access between managers.

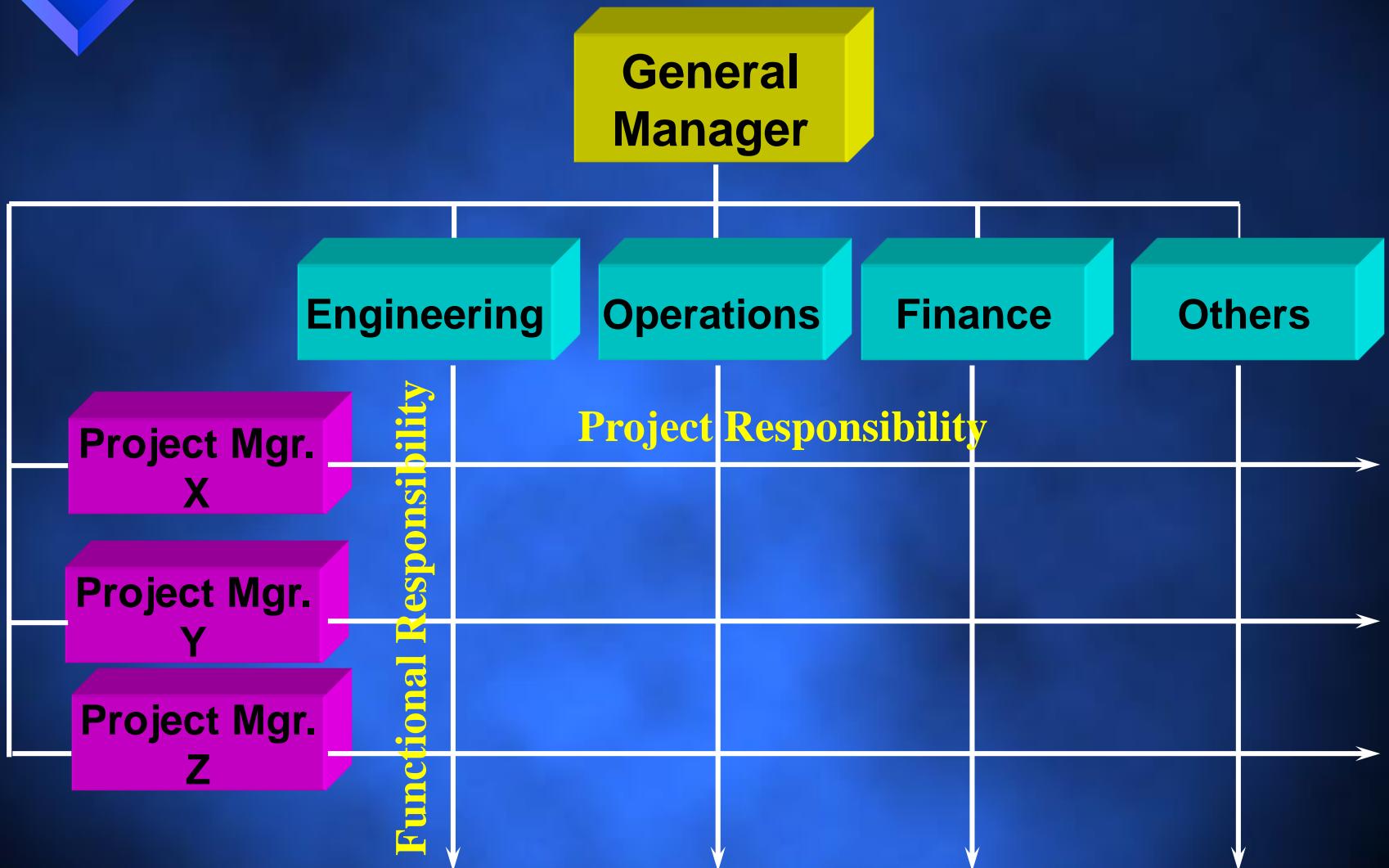


Matrix Development

(Continued)

- ❖ All managers must have input into the planning process.
- ❖ Both horizontally and vertically oriented managers must be willing to negotiate for resources.
- ❖ The horizontal line must be permitted to operate as a separate entity except for administrative purposes.

The Matrix Management Structure



Matrix Structure

Advantages

- ❖ The project manager maintains maximum project control (through the line managers) over all resources, including cost and personnel.
- ❖ Policies and procedures can be set up independently for each project, provided that they do not contradict company policies and procedures.

Matrix Structure

Advantages (Continued)

- ❖ The project manager has the authority to commit company resources, provided that scheduling does not cause conflicts with other projects.
- ❖ Rapid responses are possible to change, conflict resolution, and project needs.
- ❖ The functional organization exists primarily as support for the project.

Matrix Structure

Advantages (Continued)

- ❖ Each person has a “home” after project completion. Each person can be shown a career path.
- ❖ Because key people can be shared, the program cost is minimized. People can work on a variety of problems: that is, better people control is possible.

Matrix Structure

Advantages (Continued)

- ❖ A strong technical base can be developed, and much more time can be devoted to **complex problem-solving**. Knowledge is available for all projects on an equal basis.
- ❖ Conflicts are minimal, and those requiring hierarchical referral are more easily resolved.
- ❖ There is a better balance between time, cost and performance.

Matrix Structure

Advantages (Continued)

- ❖ Rapid development of specialists and generalists occurs.
- ❖ Authority and responsibility are shared.
- ❖ Stress is distributed among the team (and the functional managers).

Matrix Structure

Disadvantages

- ❖ Multidimensional information flow.
- ❖ Multidimensional work flow.
- ❖ Dual reporting.
- ❖ Continuously changing priorities.
- ❖ Management goals different from project goals.
- ❖ Potential for continuous conflict and conflict resolution.
- ❖ Difficulty in monitoring and control.

Matrix Structure

Disadvantages (Continued)

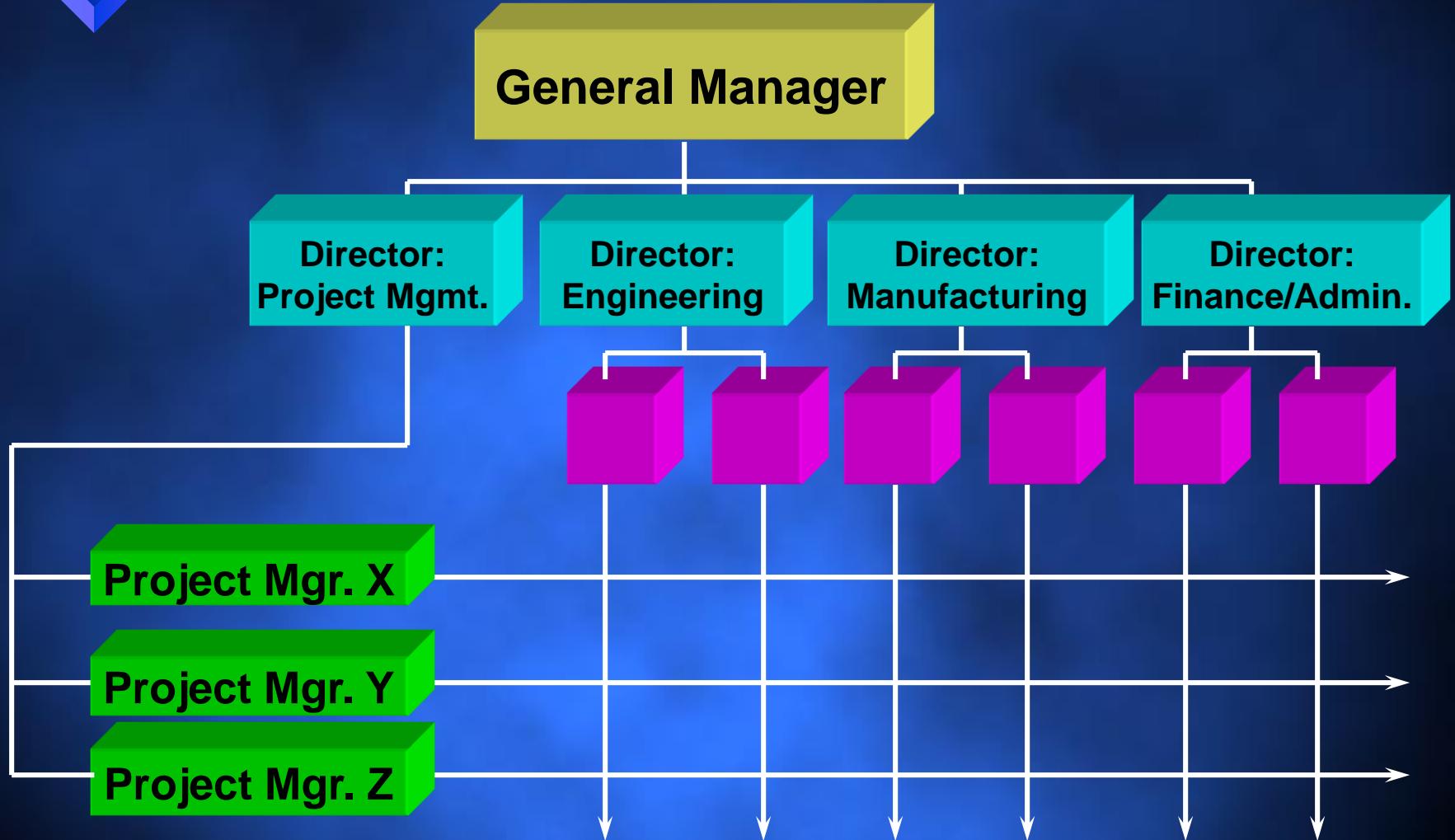
- ❖ Company-wide, the organizational structure is not cost-effective because more people than necessary are required, especially administrative.
- ❖ Each project organization operates independently. Care must be taken that duplication of efforts does not occur.
- ❖ More effort and time are needed initially to define policies and procedures, compared to the traditional organizational form.

Matrix Structure

Disadvantages (Continued)

- ❖ Functional managers may be biased according to their own set of priorities.
- ❖ The balance of power between the project and functional organizations must be watched.
- ❖ The balance of time, cost and performance must be monitored.
- ❖ Although rapid response time is possible for individual problem resolution, the reaction time can become quite slow.

The Matrix Management Structure (With a Director of Project Management)



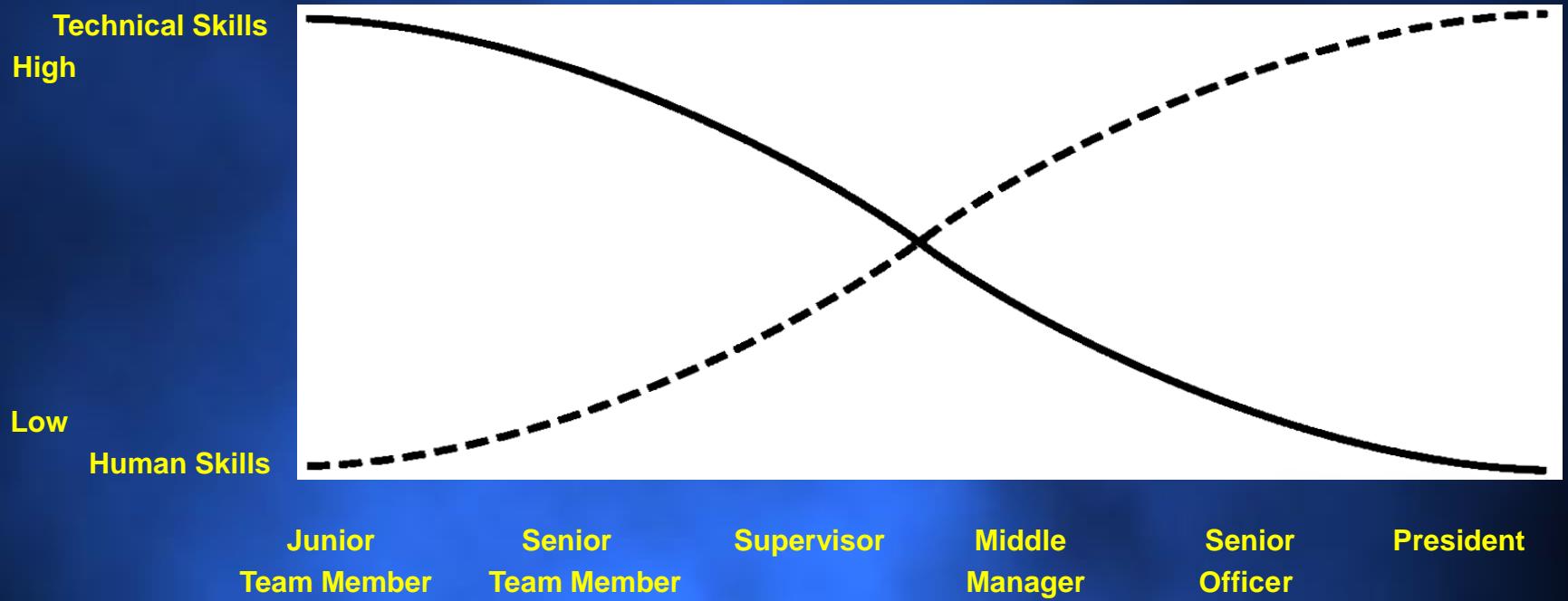
THE OUT-OF-CONTROL MATRIX

When a matrix appears to be out of control executives tend to revert back to classical management. This results in:

- ✉ Reduced authority for the project manager.
- ✉ All project decision-making performed at executive levels.
- ✉ Increase in executive meddling in projects.
- ✉ Creation of endless job description manuals.

This can often be prevented by asking for authority / responsibility clarification and using a responsibility assignment matrix (RAM).

Balancing Technical and Human Skills



Factors For Selecting An Organizational Form

- ❖ Project size
- ❖ Project length
- ❖ Project management experience
- ❖ Philosophy and visibility of executives
- ❖ Project location
- ❖ Available resources
- ❖ Unique aspects of the project

Strategic Business Unit Project Management

