

PM

(Project Management)

International Campus – Kish
Sharif University of Technology

Session#5

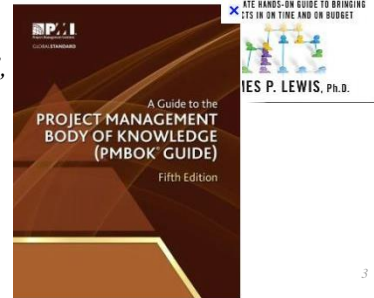
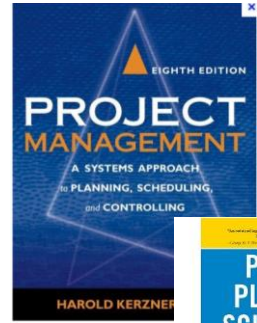


Course Description

- *Instructor*
 - *Omid Fatahi Valilai, Ph.D. Industrial Engineering Department, Sharif University of Technology*
 - *Email: Omidf@ie.sharif.edu, Tel: 021-6616-5706*
 - *Web site: <http://sharif.edu/~fvalilai>*
- *Class time*
 - *Thursday* *09:30~12:30-13:00~16:00- 16:30~19:30*
- *Course evaluation*
 - *Mid-term* *(30%)*
 - *Final exam* *(40%)*
 - *Quiz* *(10%)*
 - *Exercise* *(20%)*

Course Description (Continued ...)

- **Mid-term session:**
 - 23rd, Aban 1392
- **Reference:**
 - Kerzner, H., “Project Management—A Systems Approach to Planning, Scheduling, and Controlling, Eighth Edition”, 2003, John Wiley & Sons, Inc.
 - Lewis, James P.; “Project planning, scheduling, and Control a hands-on guide to bringing projects in on time and on budget”, 2001, McGraw-Hill
 - Project Management Institute; “A Guide to the Project; Management Body of Knowledge”, 5th edition, 2013, Project Management Institute, Inc.



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Course Description (Continued...)

Course Calendar:

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Course Description (Continued..)

- *Contents:*
 - *Chapter 1 - Overview*
 - *Chapter 2 - Project Management Growth—Concepts and Definitions*
 - *Chapter 3 - Organizational Structures*
 - *Chapter 4 - Organizing and Staffing the Project Office and Team*
 - *Chapter 5 - Management Functions*
 - *Chapter 6 - Time Management and Stress*
 - *Chapter 7 - Conflicts*
 - *Chapter 8 - Special Topics*
 - *Chapter 9 - The Variables for Success*
 - *Chapter 10 - Working with Executives*
 - *Chapter 11 - Planning*

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Course Description (Continued..)

- *Contents:*
 - *Chapter 12 - Network Scheduling*
 - *Chapter 13 - Project Graphics*
 - *Chapter 14 - Pricing and Estimating*
 - *Chapter 15 - Cost Control*
 - *Chapter 16 - Trade-off Analysis in a Project Environment*
 - *Chapter 17 - Risk Management*
 - *Chapter 18 - Learning Curves*
 - *Chapter 19 - Modern Developments in Project Management*
 - *Chapter 20 - Quality Management*
 - *Chapter 21 - Contracts and Procurement*
 - *Chapter 22 - Critical Chain Project Management*

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Chapter 3: Organizational Structures

▪ Introduction

- *During the past thirty years there has been a so-called hidden revolution in the introduction and development of new organizational structures.*
- *Four major factors that caused the onset of the organizational revolution:*
 - *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)*

Chapter 3: Organizational Structures

▪ Organizational workflow

- *Organizations are continually restructured to meet the demands imposed by the environment. Restructuring can change the role of individuals in the formal and the informal organization*
- *In the discussion of organizational structures, the following definitions will be used:*
 - *Authority is the power granted to individuals (possibly by their position) so that they can make final decisions.*
 - *Responsibility is the obligation incurred by individuals in their roles in the formal organization to effectively perform assignments.*
 - *Accountability is being answerable for the satisfactory completion of a specific assignment. (Accountability = authority + responsibility.)*

Chapter 3: Organizational Structures

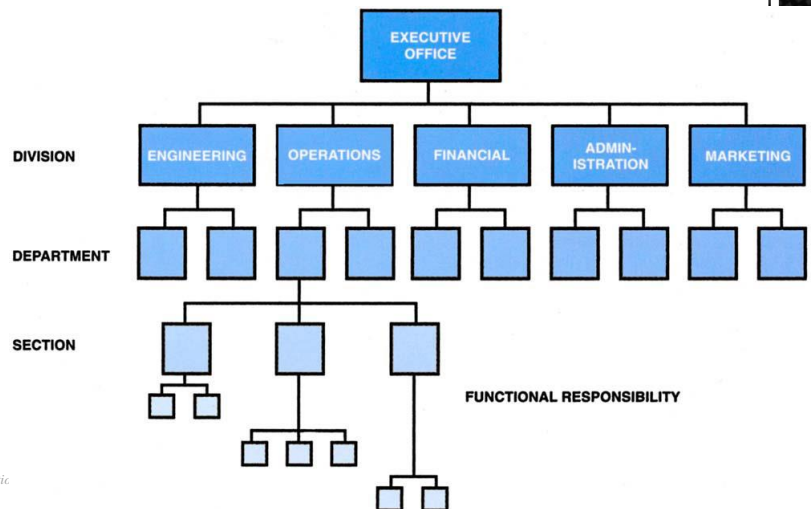
- **Organizational workflow**
 - *Even with these clearly definable divisions of authority, responsibility, and accountability, establishing good relationships between project and functional managers can take a great deal of time.*
 - *The normal progression in the growth of trust is as follows:*
 - *Even though a problem exists, both the project and functional managers deny that any problem exists.*
 - *When the problem finally surfaces, each manager blames the other.*
 - *As trust develops, both managers readily admit responsibility for the problems.*
 - *The project and functional managers meet face-to-face to work out the problem.*
 - *The project and functional managers begin to formally and informally anticipate problems.*

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Chapter 3: Organizational Structures

- **Traditional (classical) organization**
 - *The classical management organization, as shown in Figure was satisfactory for control, and conflicts were minimal.*



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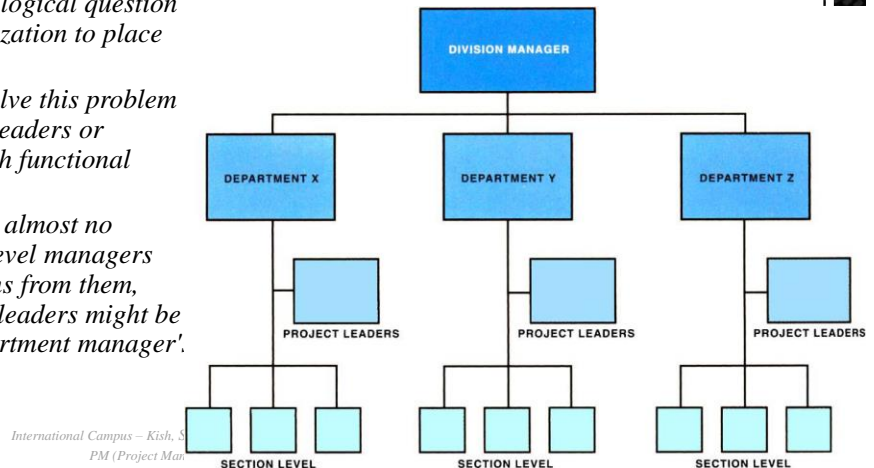
- *Traditional (classical) organization*
 - *Advantages*
 - *Easier budgeting and cost control are possible.*
 - *Better technical control is possible.*
 - *Specialists can be grouped to share knowledge and responsibility.*
 - *Personnel can be used on many different projects.*
 - *All projects will benefit from the most advanced technology (better utilization of scarce personnel).*
 - *Flexibility in the use of manpower.*
 - *A broad manpower base to work with.*
 - *Continuity in the functional disciplines; policies, procedures, and lines of responsibility are easily defined and understandable.*
 - *Admits mass production activities within established specifications.*
 - *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.*

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- *Developing work integration positions*
 - *As companies grew in size, more emphasis was placed on multiple ongoing programs with high-technology requirements.*
 - *As management discovered that the critical point in any program is the interface between functional units, the new theories of "interface management" developed.*
 - *Because of the interfacing problems, management began searching for innovative methods to coordinate the flow of work between functional units without modification to the existing organizational structure through mechanisms like:*
 - *Rules and procedures*
 - *Planning processes*
 - *Hierarchical referral*
 - *Direct contact*

Chapter 3: Organizational Structures

- *Developing work integration positions*
 - *When the need for project managers was acknowledged, the next logical question was where in the organization to place them.*
 - *The first attempt to resolve this problem was to develop project leaders or coordinators within each functional department.*
 - *The project leaders had almost no authority, and section-level managers refused to take directions from them, fearing that the project leaders might be next in line for the department manager's position.*

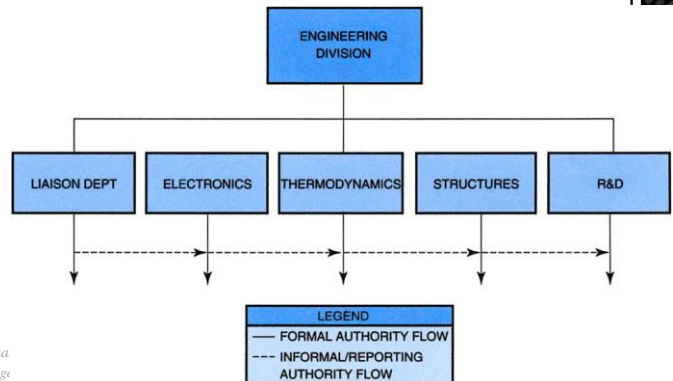


Chapter 3: Organizational Structures

- *Developing work integration positions*
 - *The next step in the evolution of project management was the task force concept.*
 - *Rationale behind the task force concept was that integration could be achieved if each functional unit placed a representative on the task force.*
 - *Development of the task force concept was a giant step toward conflict resolution*
 - *A strength of the approach was that it could be established very rapidly and with very little paperwork.*
 - *Integration, however, was complicated; work flow was difficult to control; and functional support was difficult to obtain because it was almost always strictly controlled by the functional manager.*

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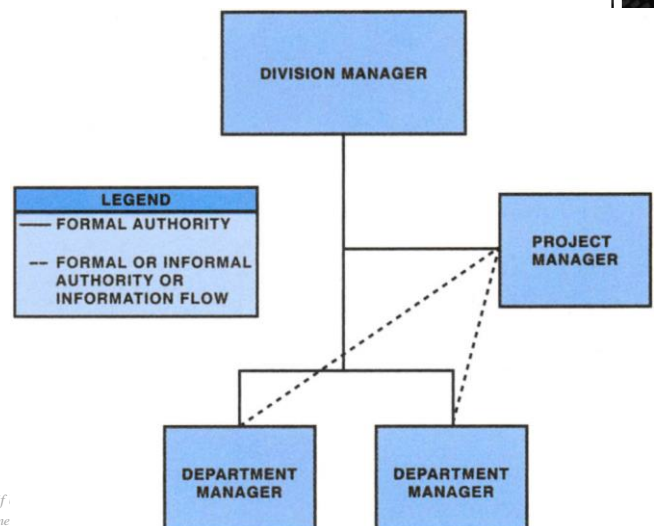
- **Developing work integration positions**
 - *The next step in the evolution of work integration was the establishment of liaison departments, particularly in engineering divisions that perform multiple projects involving a high level of technology.*
 - *The prime function was to assure that all departments worked toward the same requirements and goals.*
 - *Liaison departments are still in existence in many large companies and typically handle engineering changes and design problems.*



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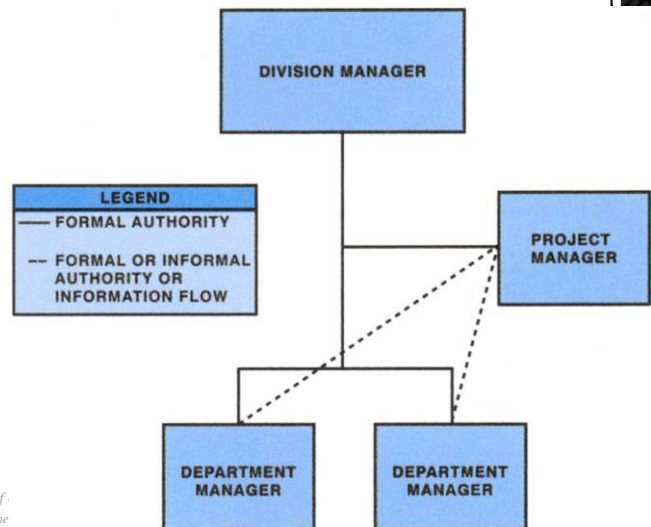
- **Line–staff organization (project coordinator)**
 - *It soon became obvious that control of a project must be given to personnel whose first loyalty is directed toward the completion of the project. Thus the project management position must not be controlled by the functional managers*



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Chapter 3: Organizational Structures

- **Line–staff organization (project coordinator)**
 - Two possible situations can exist with this form of line–staff project control.
 - The project manager serves only as the focal point for activity control, that is, a center for information.
 - The prime responsibility of the project manager is to keep the division manager informed of the status of the project and to "harass" or attempt to "influence" managers into completing activities on time.



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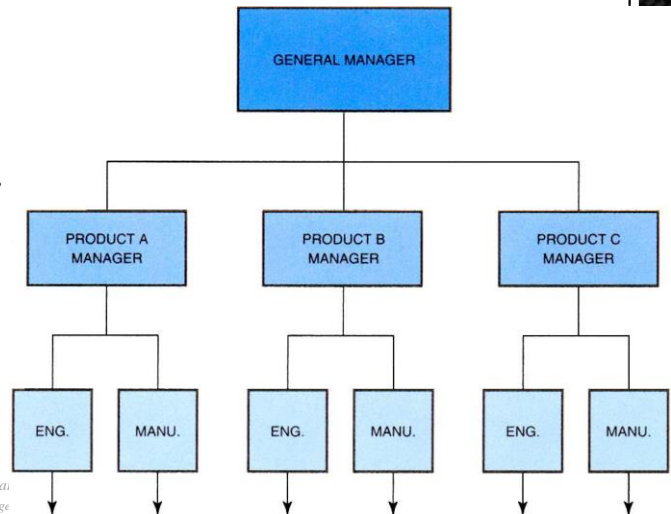
- **Line–staff organization (project coordinator)**
 - Two possible situations can exist with this form of line–staff project control.
 - In the second situation, the project manager is given more authority; using the authority vested in him by the division manager, he can assign work to individuals in the functional organizations.
 - Although this second situation did occur during the early stages of matrix project management, it did not last because:
 - 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.

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- *Pure product (projectized) organization*
 - *The pure product organization develops as a division within a division*
 - *The major advantage of this organizational flow is that one individual, the program manager, maintains complete line authority over the entire project.*
 - *In pure product organizations, long lead times became a thing of the past*



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- *Pure product (projectized) organization*
 - *The responsibilities attributed to the project manager were entirely new.*
 - *First, his authority was now granted by the vice president and general manager.*
 - *The program manager handled all conflicts, both those within his organization and those involving other projects.*
 - *Interface management was conducted at the program manager level. Upper-level management was now able to spend more time on executive decision-making than on conflict arbitration.*

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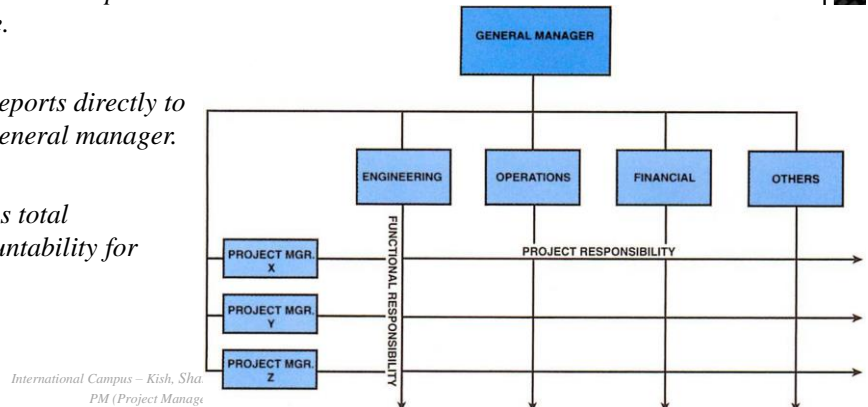
- *Pure product (projectized) organization*
 - *Advantages:*
 - *Participants work directly for the project manager. Unprofitable product lines are easily identified and can be eliminated.*
 - *Strong communications channels.*
 - *Staffs can maintain expertise on a given project without sharing key personnel.*
 - *Very rapid reaction time is provided.*
 - *Personnel demonstrate loyalty to the project; better morale with product identification.*
 - *A focal point develops for out-of-company customer relations.*
 - *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.*

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- *Pure product (projectized) organization*
 - *Disadvantages:*
 - *Cost of maintaining this form in a multiproduct company would be prohibitive due to duplication of effort, facilities, and personnel; inefficient usage.*
 - *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.*
 - *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.*
 - *Lack of opportunities for technical interchange between projects.*
 - *Lack of career continuity and opportunities for project personnel.*

Chapter 3: Organizational Structures

- **Matrix organizational form**
 - The matrix organizational form is an attempt to combine the advantages of the pure functional structure and the product organizational structure.
 - Each project manager reports directly to the vice president and general manager.
 - The project manager has total responsibility and accountability for project success.



Chapter 3: Organizational Structures

- **Matrix organizational form**
 - **Advantages**
 - Policies and procedures can be set up independently for each project, provided that they do not contradict company policies and procedures.
 - 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 changes, conflict resolution, and project needs (as technology or schedule).
 - The functional organizations exist primarily as support for the project.
 - Each person has a "home" after project completion. People are susceptible to motivation and end-item identification. 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.
 - 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 referrals are more easily resolved.
 - There is a better balance among time, cost, and performance.
 - Rapid development of specialists and generalists occurs.
 - Authority and responsibility are shared.
 - Stress is distributed among the team (and the functional managers).

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Chapter 3: Organizational Structures

▪ Matrix organizational form

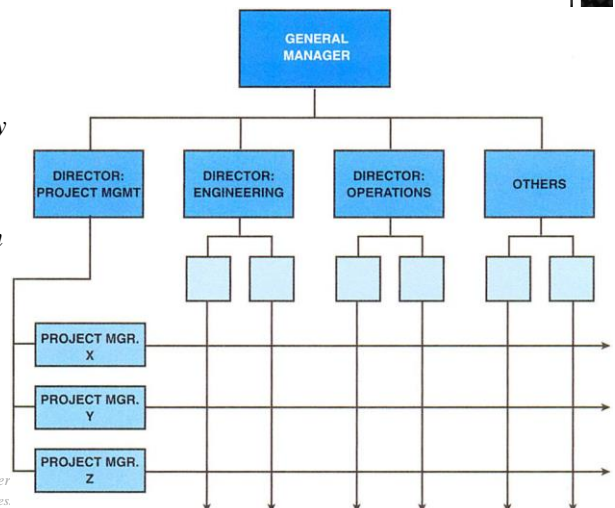
▪ Disadvantages

- *Multidimensional information /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.*
- *Company-wide, the organizational structure is not cost-effective because more people than necessary are required, primarily 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 traditional form.*
- *Functional managers may be biased according to their own set of priorities.*
- *Balance of power between functional and project organizations must be watched.*
- *Balance of time, cost, and performance must be monitored.*

Chapter 3: Organizational Structures

▪ Modification of matrix structures

- *The matrix can take many forms, but there are basically three common varieties. Each type represents a different degree of authority attributed to the program manager and indirectly identifies the relative size of the company*
- *In this type of arrangement, all conflicts between projects are referred to the general manager for resolution*



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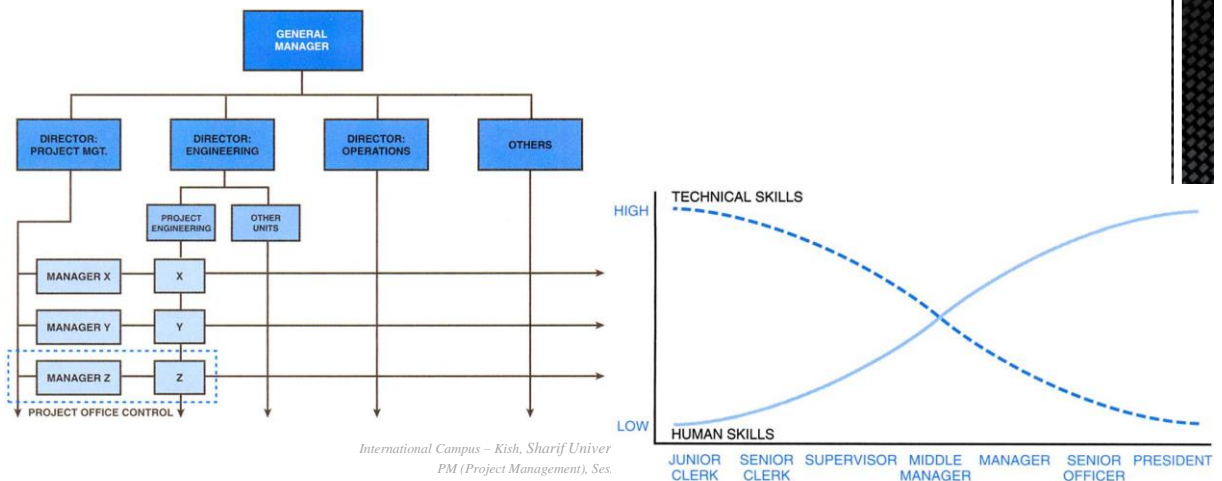
- *Modification of matrix structures*
 - *A new position must be created, that of director of programs, or manager of programs or projects, who is responsible for all program management.*
 - *One difference in the roles of the M.P.M. and the project manager is that the M.P.M. must place a great deal more emphasis on the overview of a project than on the nuts and bolts, tools, networks and the details of managing the project.*
 - *The M.P.M. is a project manager, a people manager, a change manager and a systems manager. In general, one role cannot be considered more important than the other.*

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- *Modification of matrix structures*



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- Modification of matrix structures

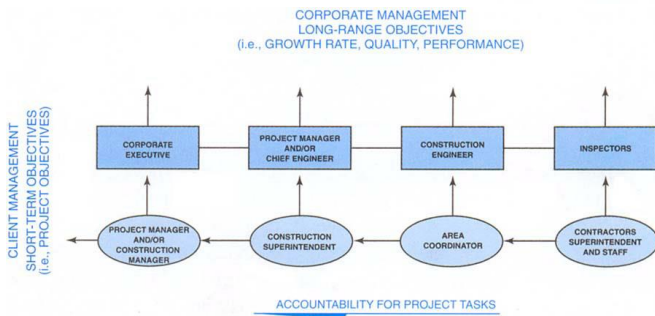
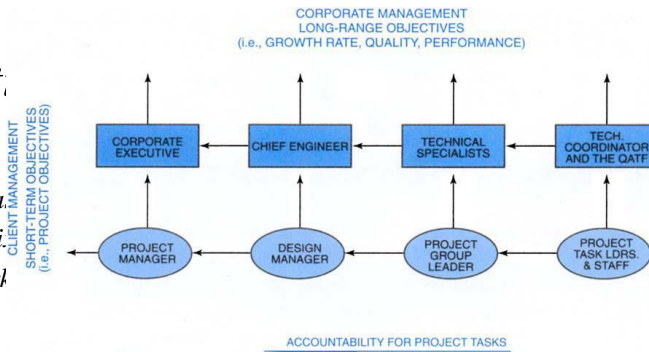
<p><i>Project Management</i></p> <ul style="list-style-type: none"> •Total project planning •Cost control •Schedule control •System specifications •Logistics support 	<p><i>Project Engineering</i></p> <ul style="list-style-type: none"> •Total project planning •Cost control •Schedule control •System specifications •Logistics support
<ul style="list-style-type: none"> •Contract control •Report preparation and distribution •Procurement •Identification of reliability and maintainability requirements •Staffing •Priority scheduling •Management information systems 	<ul style="list-style-type: none"> •Configuration control •Fabrication, testing, and production technical leadership support

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- Matrix layering

- Matrix layering can be defined as a matrix structure where the project manager is responsible for the project tasks and the technical specialists are responsible for the technical quality.
- Matrix layering can also be a matrix structure where the project manager is responsible for the project tasks and the technical specialists are responsible for the technical quality.
- The formal matrix exists for work information flow.



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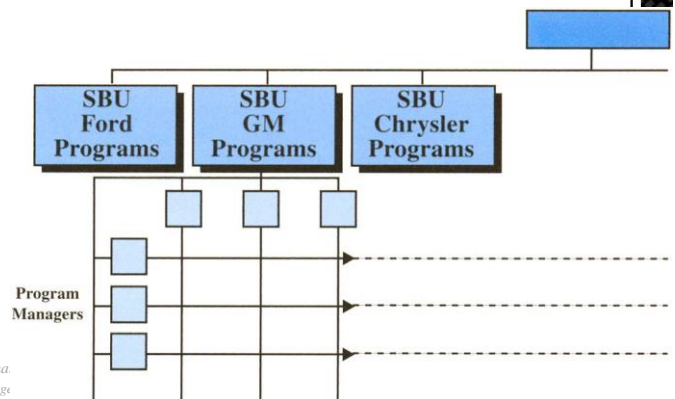
- *Selecting the organizational form*
 - *Project management has matured as an outgrowth of the need to develop and produce complex and/or large projects in the shortest possible time, within anticipated cost, with required reliability and performance, and (when applicable) to realize a profit.*
 - *To answer this question, we must first determine whether the necessary characteristics exist to warrant a project management organizational form*
 - *Definable in terms of a specific goal*
 - *Infrequent, unique, or unfamiliar to the present organization*
 - *Complex with respect to interdependence of detailed tasks*
 - *Critical to the company*

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- *Selecting the organizational form*
 - *The basic factors that influence the selection of a project organizational form are:*
 - *Project size*
 - *Project length*
 - *Experience with project management organization*
 - *Philosophy and visibility of upper-level management*
 - *Project location*
 - *Available resources*
 - *Unique aspects of the project*

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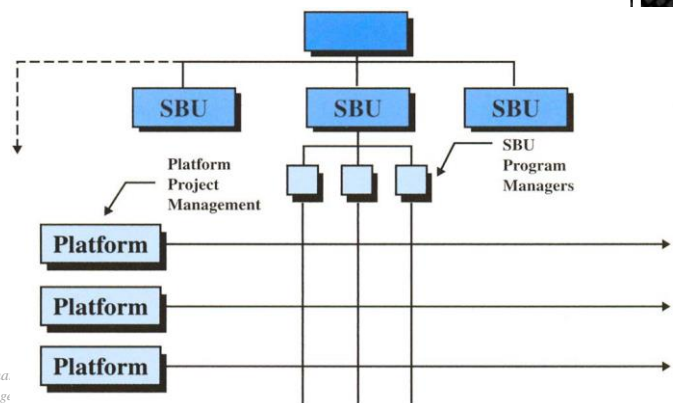
- **Strategic Business Unit (SBU) project management**
 - An SBU is a grouping of functional units that have the responsibility for profit (or loss) of part of the organization's core businesses
 - The executive in charge of the strategic business unit may act as the sponsor for all of the program and project managers within the SBU.
 - It is a customer-focused organizational structure.



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- **Strategic Business Unit (SBU) project management**
 - Each SBU may end up using the same platform (i.e., powertrain, chassis, and other underneath components).
 - This type of matrix is multidimensional inasmuch as each SBU could already have an internal matrix



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