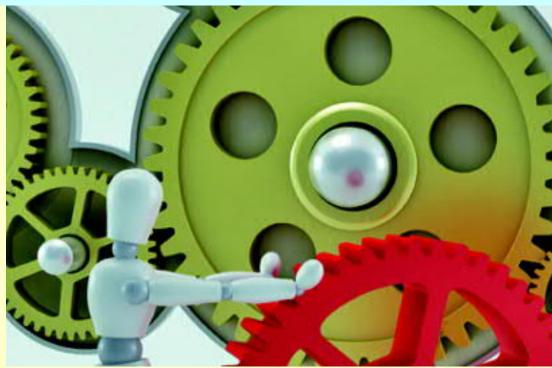
MECH3010/4410 Engineering and technology management http://me.hku.hk/bse/MECH3010/



Organizing and Staffing



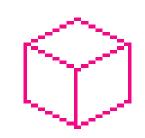
Dr. Sam C. M. Hui Department of Mechanical Engineering The University of Hong Kong E-mail: cmhui@hku.hk

Jan 2015

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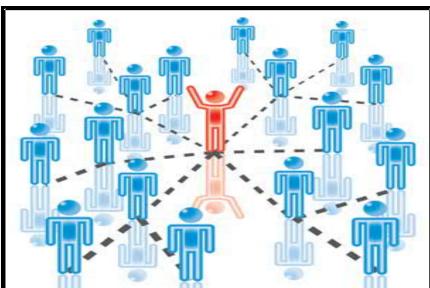


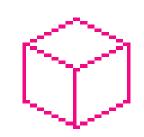
- Nature of Organizing
- Organization Structure
- Basis of Structuring
- Teams
- Staffing Technical Firms
- Staff Training & Development
- Delegation



• Organizing

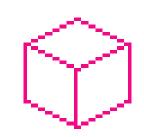
• It is the process of establishing a structure for the organization so that helps the manpower of the organization to function systematically to fulfill the organizational goals effectively





• Organizing

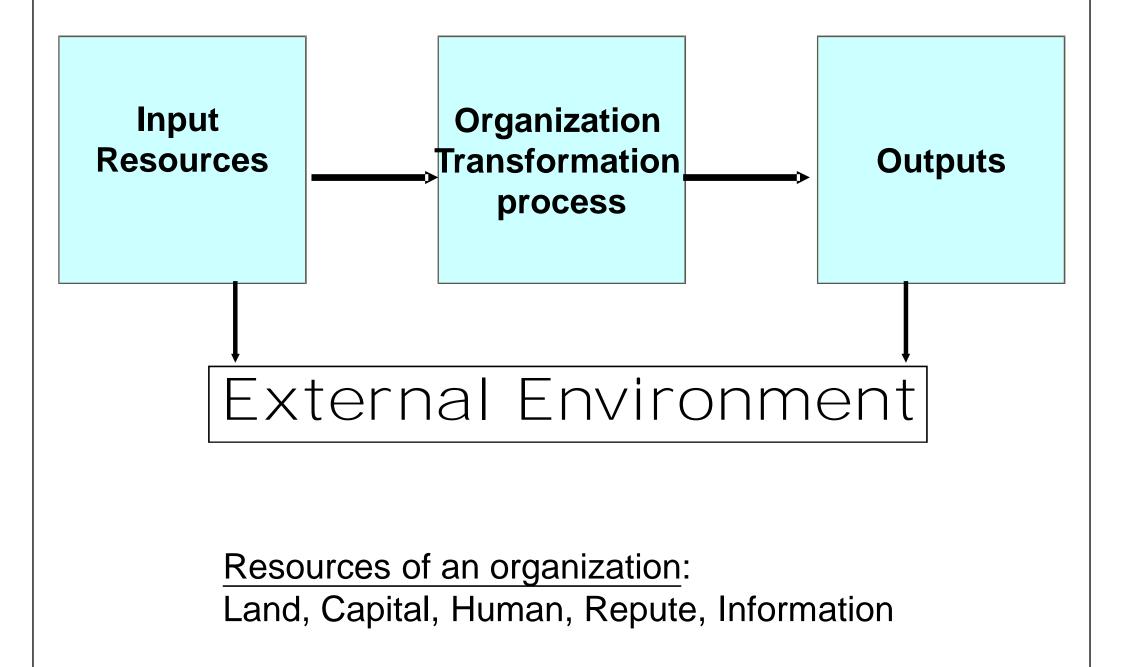
- Arrange and relate the work, so that it can be done efficiently by people specifically:
 - *Ensure* that important work is done
 - **Provide** continuity
 - *Form* basis for salary administration
 - Aid delegation
 - *Promote* growth and diversification
 - *Encourage* teamwork
 - *Stimulate* creativity

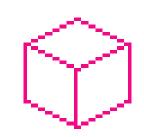


Organization

- A group of people trying to achieve something
- A cohesive body established for a specified purpose
- A structured process in which people, act and interact, for the achievement of objectives
- Divided into logical sections with links of responsibility within and external to the sections, the whole being coordinated to

Elements of an organizational system





- Types of organizations
 - Profit & non-profit organizations
 - Government, semi-government and private origination
 - Private and public
 - Manufacturing and services organizations
 - Sales, import & export organizations
 - Finical organizations
 - Centralized & decentralized

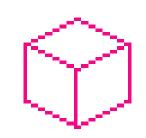




- Sole proprietorship
 - Few legal restrictions
 - Owner forced to make all decisions
 - Profits taxed once
- Partnership
 - Two or more partners
 - Easy to organize
 - Partners do individual tax
 - Unlimited liability for partners debts

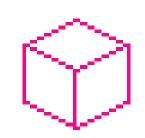
- Legal forms of organization (cont'd)
 - Limited Liability Company (LLC)
 - Owners have limited personal liability
 - Only taxed once
 - Corporations
 - Owned by shareholders
 - No liability beyond stock
 - Taxed twice
 - Subject to many state and federal controls
 - Cooperatives
 - Owned by users and customers
 - Usually tax free

- Organizing tasks
 - Splitting of work into small tasks
 - Assign work to groups/ individuals
 - Task coordination's
 - Avoiding duplications
 - Jobs & responsibilities should be clearly denied
 - Carry out action plans



• Organizing the organization

- Organizing resources to achieve the goals in an optimum fashion. Examples are organizing new departments, human resources, office and file systems, re-organizing businesses, etc.
- Leading, including to set direction for the organization, groups and individuals and also influence people to follow that direction. Examples are establishing strategic direction (vision, values, mission and / or goals) and championing methods of organizational performance management to pursue that direction



- Organizing outcomes
 - People are employed on permanents/ temporary basis
 - Teams and team leaders are built
 - Training is provided
 - Ensure to focus on common goals
 - Understand the customer and communicate to the team
 - Delegate powers and responsibilities



- The <u>organizational structure</u> refers to the type of framework a company uses to distinguish power and authority, roles and responsibilities, and the manner in which information flows through the organization
- There are two basic forms:
 - Mechanistic structure
 - Organic structure





• Mechanistic structure

- Also known as bureaucratic structure
- It is based on a formal, centralized network
- Best suited for companies that operate in a stable and certain environment
- Characteristics of mechanistic structures include:
 - Horizontal communication
 - Well-defined hierarchy
 - Top-level managers make the majority of decisions
 - Individualized job specialization
 - Low integration between functional areas or departments



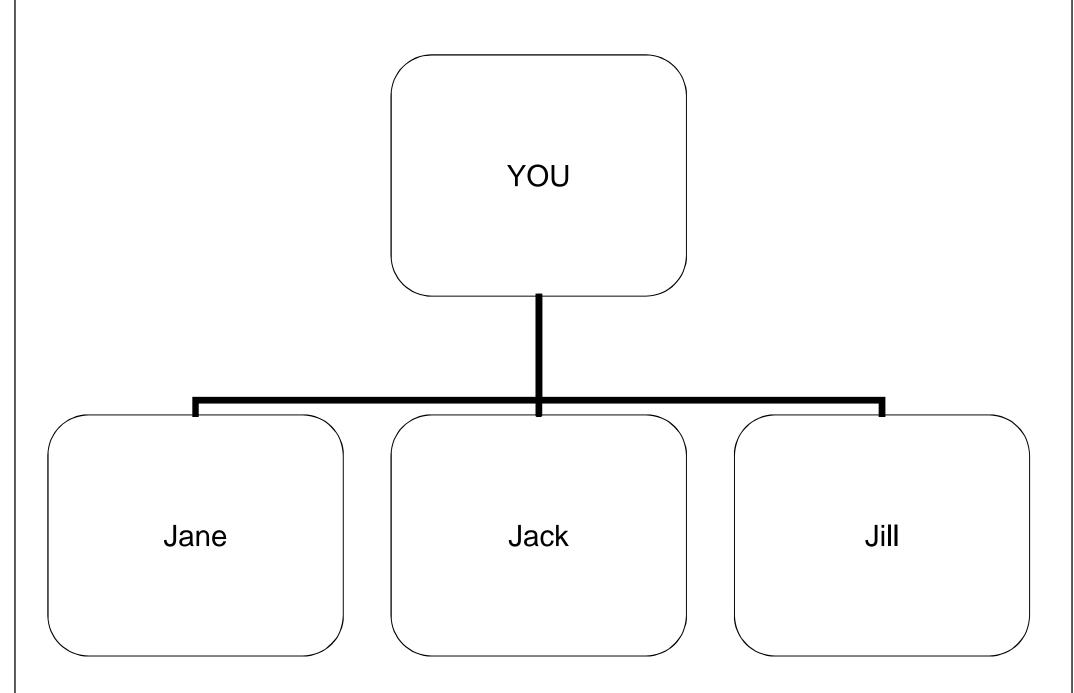
• Organic structure

- Used in organizations that face unstable and dynamic environments and need to quickly adapt to change
- Characteristics of organic structures include:
 - Lateral communication
 - Highly integrated and dependent functional areas
 - Do not rely on standardized processes and procedures
 - Multiple tasks are differentiated to one person
 - Decision-making is decentralized to allow for complex decisionmaking processes
 - Power and authority are awarded to lower-leveled employees

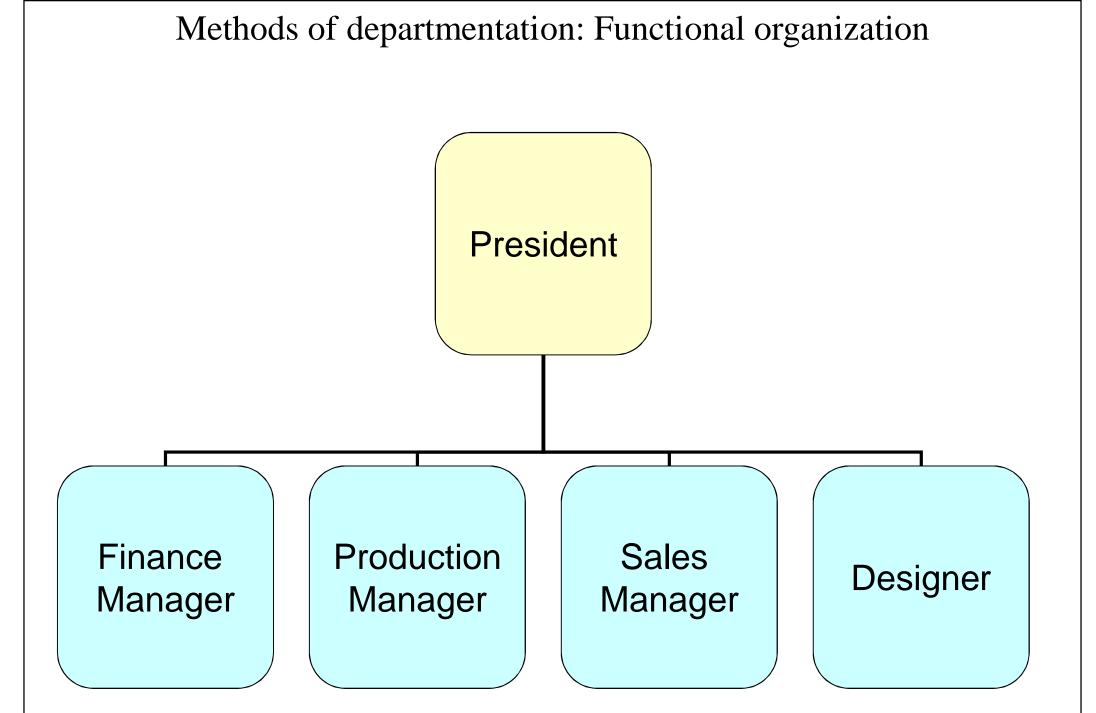


- Develop organizational structures
 - Identify and group work so that it can be done efficiently by people
 - Choices: (patterns of departmentation)
 - (1) Functional
 - (2) Discipline
 - (3) Product/Regional
 - (4) Matrix
 - (5) Team
 - (6) Network

Methods of departmentation: Basic

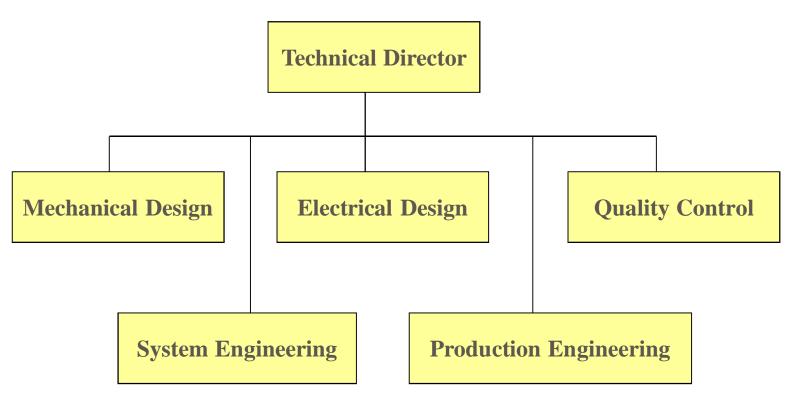


(Source: Morse, L. C. and Babcock, D. L., 2010. Managing Engineering and Technology, 5th ed.)



(Source: Morse, L. C. and Babcock, D. L., 2010. *Managing Engineering and Technology*, 5th ed.)

Functional Organization



Pros:

- Permits hierarchy of skills
- Facilitates specialization
- Simplifies coordination
- Permits use of current technologies and equipment

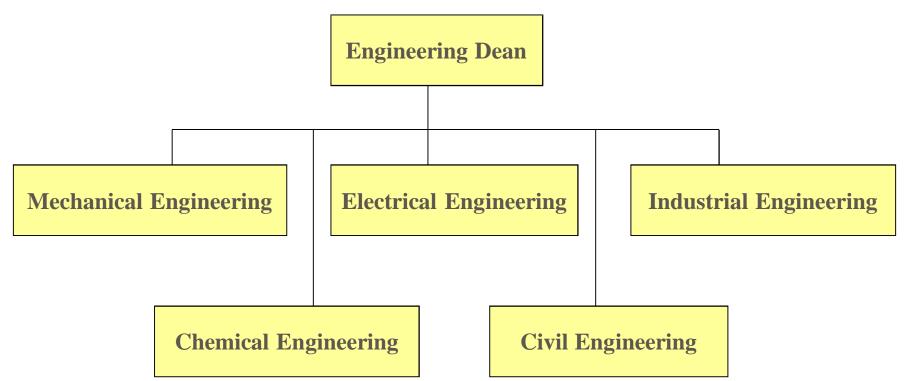
Cons:

- Encourages excessive centralization
- Delays decision making
- Compounds communication line loss
- Restricts development of managerial skills
- Limits personal growth



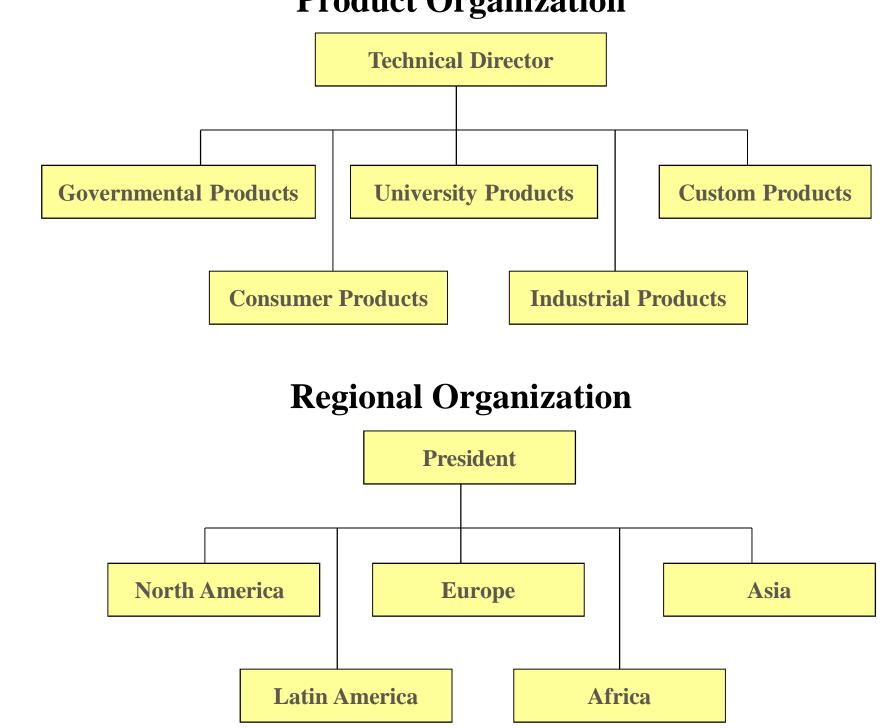
- Functional organizations: When to use
 - Organizations with high relative stability of work flow and limited product diversity - certain manufacturing operations, process industries
 - Startup companies
 - Organizations with narrow product ranges, simple marketing pattern and few production sites
- Work specialization: division of labour

Discipline-Based Organization

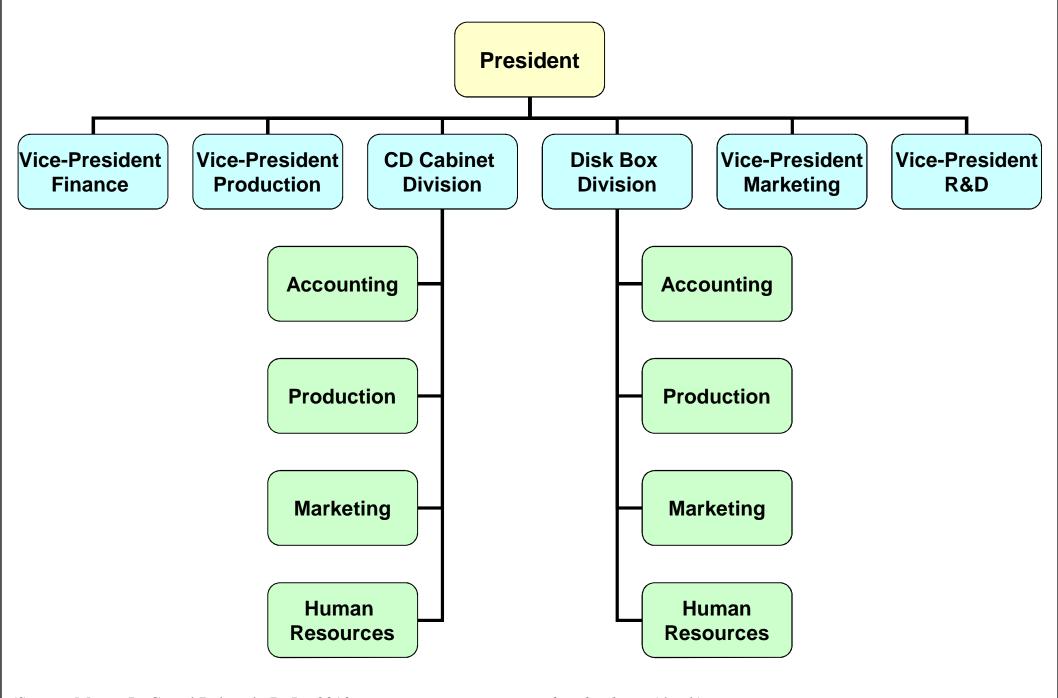


- Favored by universities, governmental laboratories and other R&D organizations
- Promote innovative pursuits in individual disciplines, allowing employees to drill down to deeper knowledge levels without requiring much coordination with others

Product Organization

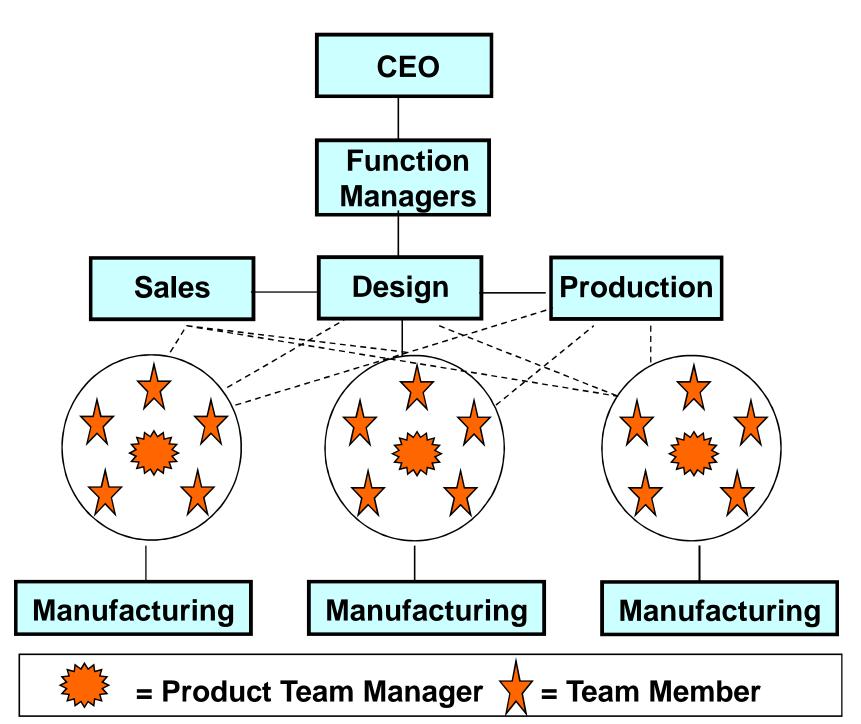


Methods of departmentation: Product organization



(Source: Morse, L. C. and Babcock, D. L., 2010. Managing Engineering and Technology, 5th ed.)

Product team structure



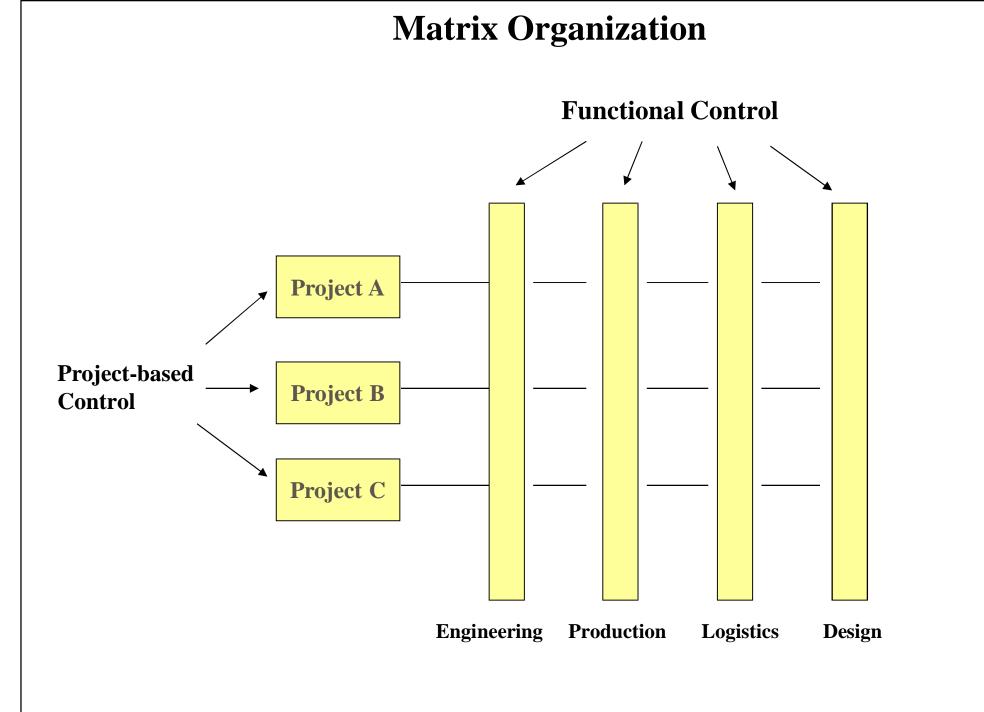
Product/Regional Organization (Pros and Cons)

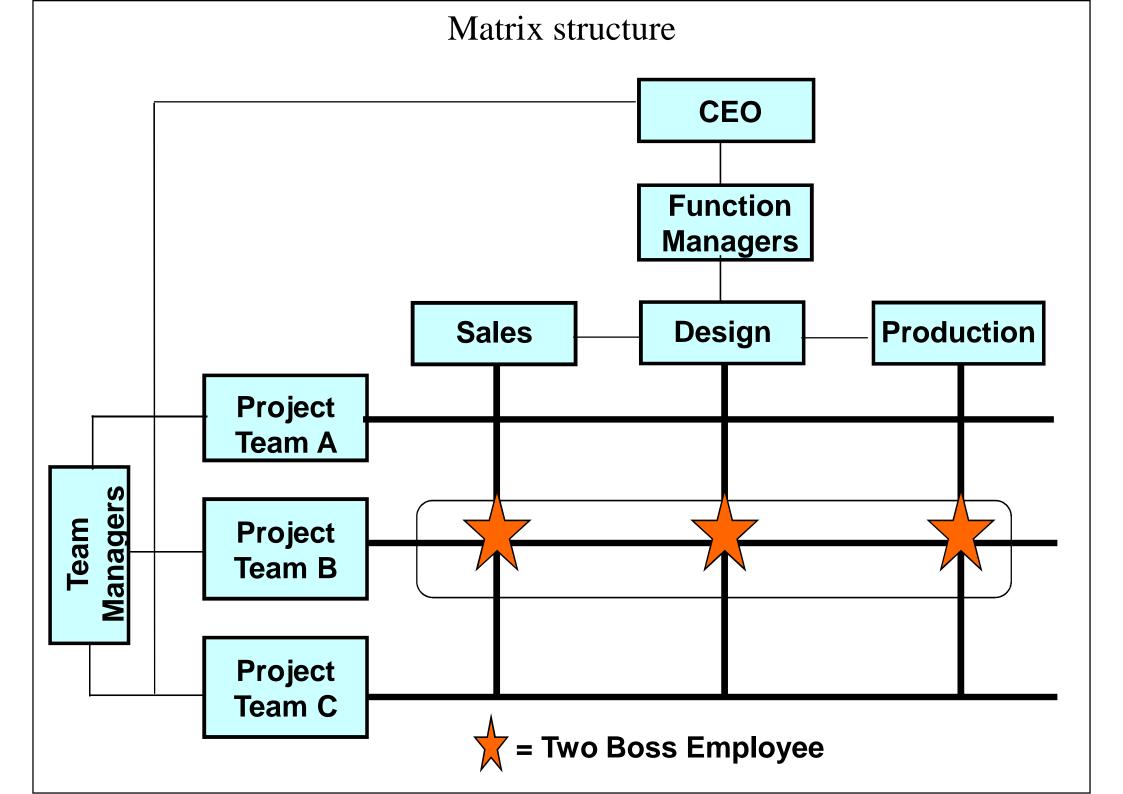
Pros:

- Focuses on end products or geographical regions
- Facilitates coordination
- Encourages management development
- Provides for decentralization
- Promotes growth

Cons:

- High costs due to layers, autonomy or duplicated facilities
- Requires management talents
- Technical obsolescence of specialists
- Changes take time to effect





Matrix Organization (Pros and Cons)

Pros:

- Project manager focus on schedule and cost, functional managers on quality/expertise
- Work load balance
- Excellent for individuals (to achieve exposure and interactions)

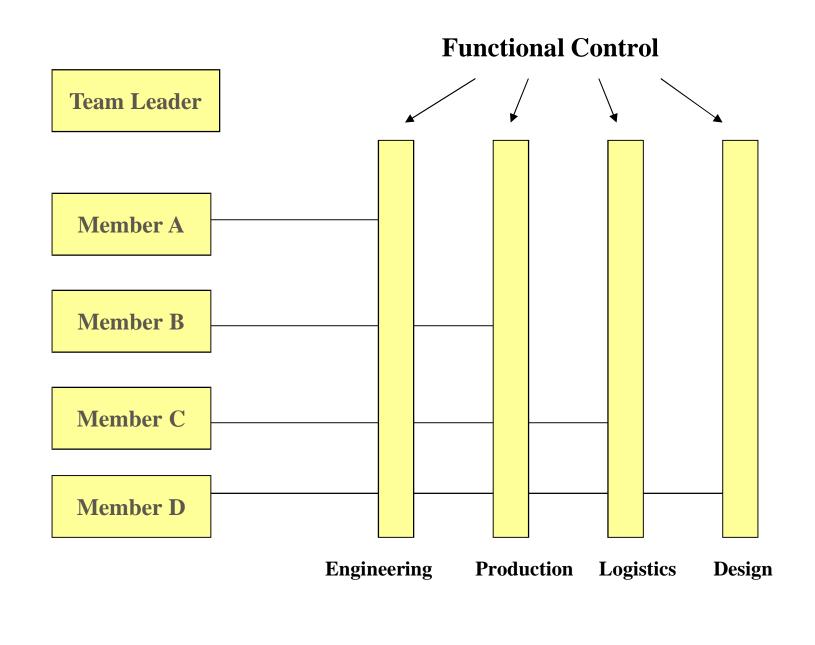
Cons:

- Dual reporting
- Severe conflicts among managers
- Delicate balance of power (people versus money/time)
- Communications
 problems



- Matrix organization: Bases for conflicts
 - Project Managers:
 - Money under control, mandate to authorize work with top management support
 - Rights to buy services elsewhere
 - Functional Manager:
 - Manpower, skills knowledge, facilities
 - Own funds to support people

Team Organization

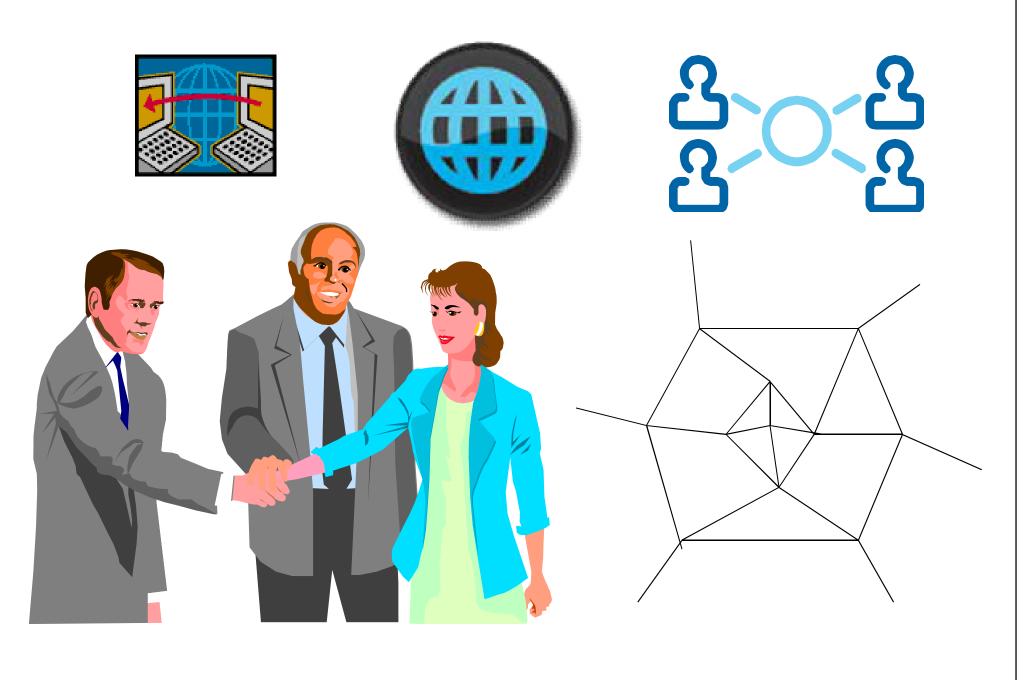




• Team organization

- Team members "on loan" from functional organizations to eliminate organizational conflicts
- Team Leader in full control
- Short term high-priority tasks/projects
- Examples: Product team, special task force
- Purposes:
 - (1) Create recommendation
 - (2) Make or do things, and
 - (3) Run things

Network Organization





- Network organization
 - Global business alliances/partnerships to manufacture, market, deliver and service products (supply chains)
 - Change alliance members from time to time
 - Diversified alliance members (e.g., company allegiance, culture, value system, business practices, geography, attitude, motivation, information sharing and collaboration, etc.)



• Question #1

• Which type of organizational structure is best suited for developing a new product which requires a high level of specialization in several functions and the time to market represents a critical factor?

• Question #2

• A materials manager suspects that the quality of work being done within his department was steadily deteriorating. He wanted to introduce a program of change to improve quality. What steps should he take?

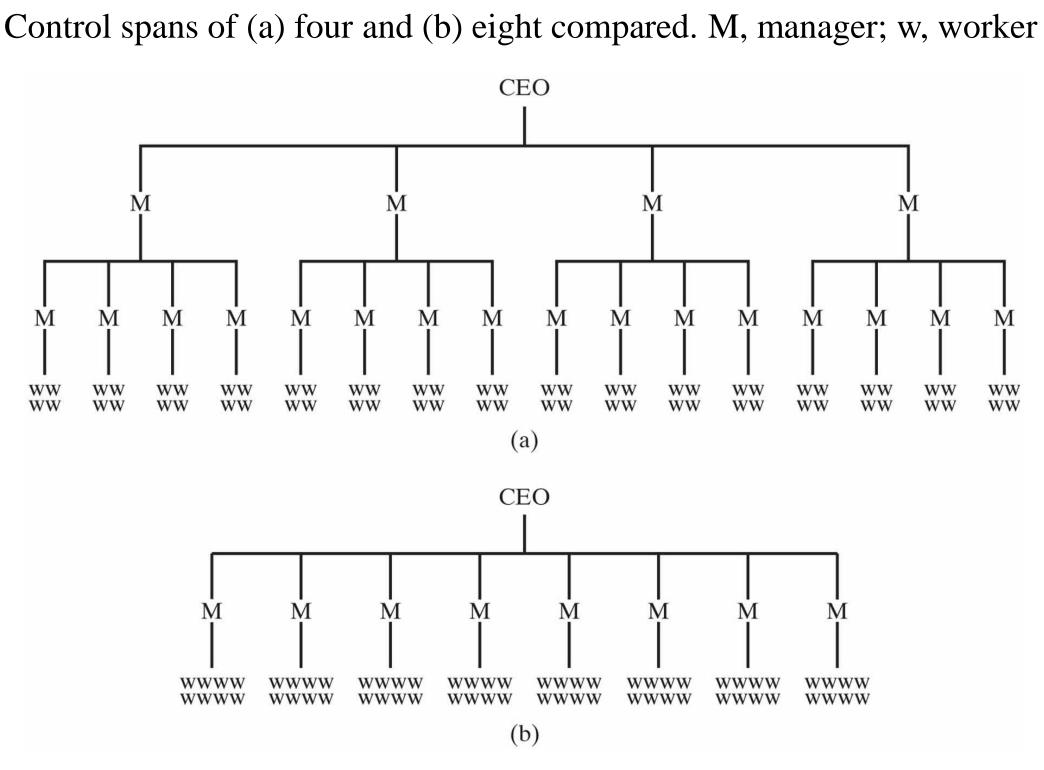
Basis of Structuring

- Definitions
 - <u>Authority</u> Power to command, act or make decisions (legal, position-based)
 - <u>Responsibility</u> Duty to perform work efficiently and in professional manner
 - <u>Accountability</u> Upwards directed obligation for securing the desired results
 - <u>Span of control</u> Number of people supervised by a manager (e.g., 7 to 20)
 - <u>Specialization</u> Increased degree of skills concentration in narrow technical domains

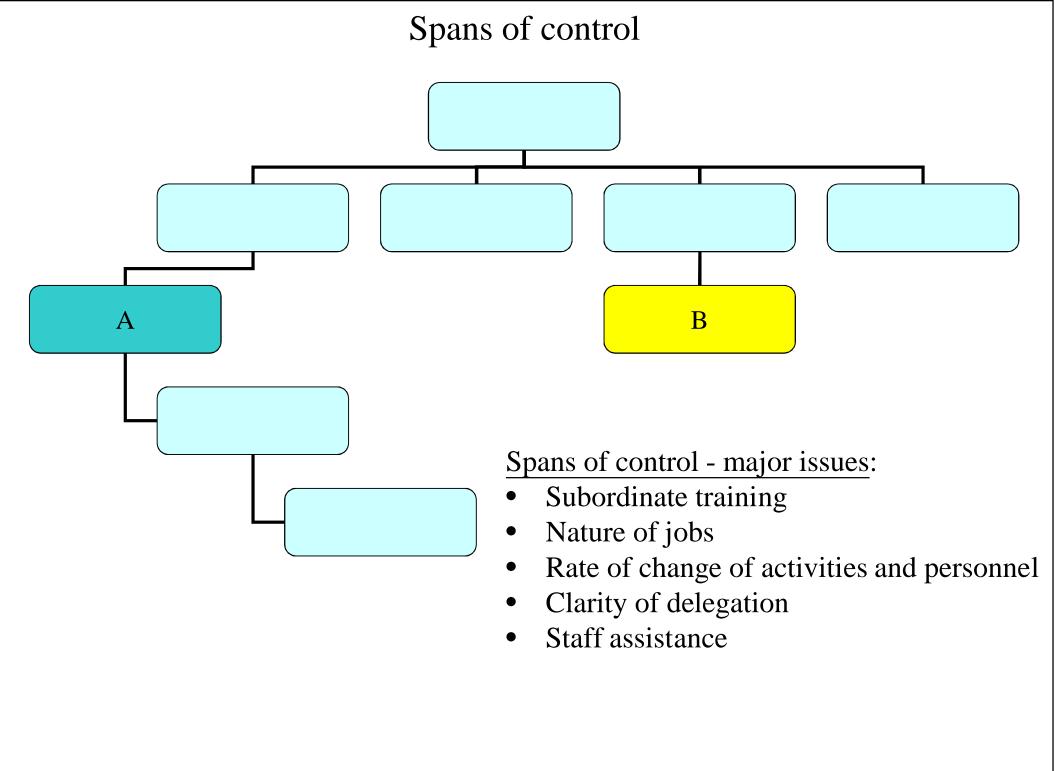
Basis of Structuring

- Major considerations
 - Span of control
 - Span of managerial responsibility
 - Objectives
 - Unity of purpose
 - Communications
 - Flexibility
 - Operational efficiency
 - Planning
 - Coordination and control





(Source: Morse, L. C. and Babcock, D. L., 2010. Managing Engineering and Technology, 5th ed.)



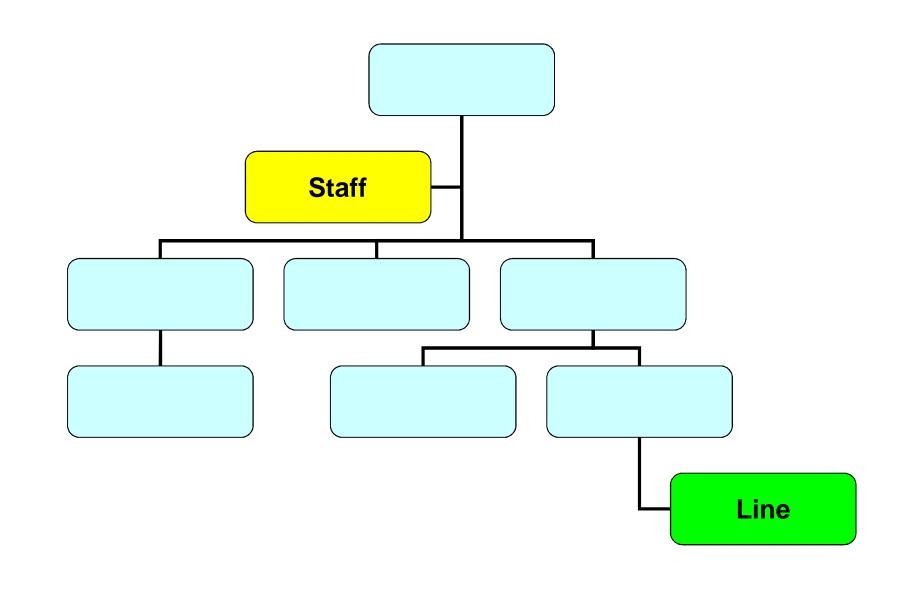
(Source: Morse, L. C. and Babcock, D. L., 2010. Managing Engineering and Technology, 5th ed.)

Basis of Structuring

• Line and staff relationships

- <u>Line</u>: Superior/Subordinate relationships typically represented vertically in organizational charts
- <u>Staff</u>: Advisory in nature, degree of influence may vary
 - Provide advice on request
 - Recommendations when appropriate
 - Must be consulted by line but have no direct authority
 - Concurring authority veto authority over line
- <u>Service</u>: Centralized support functions
 - Custodial
 - Security
 - Medical

Line and Staff Relationships



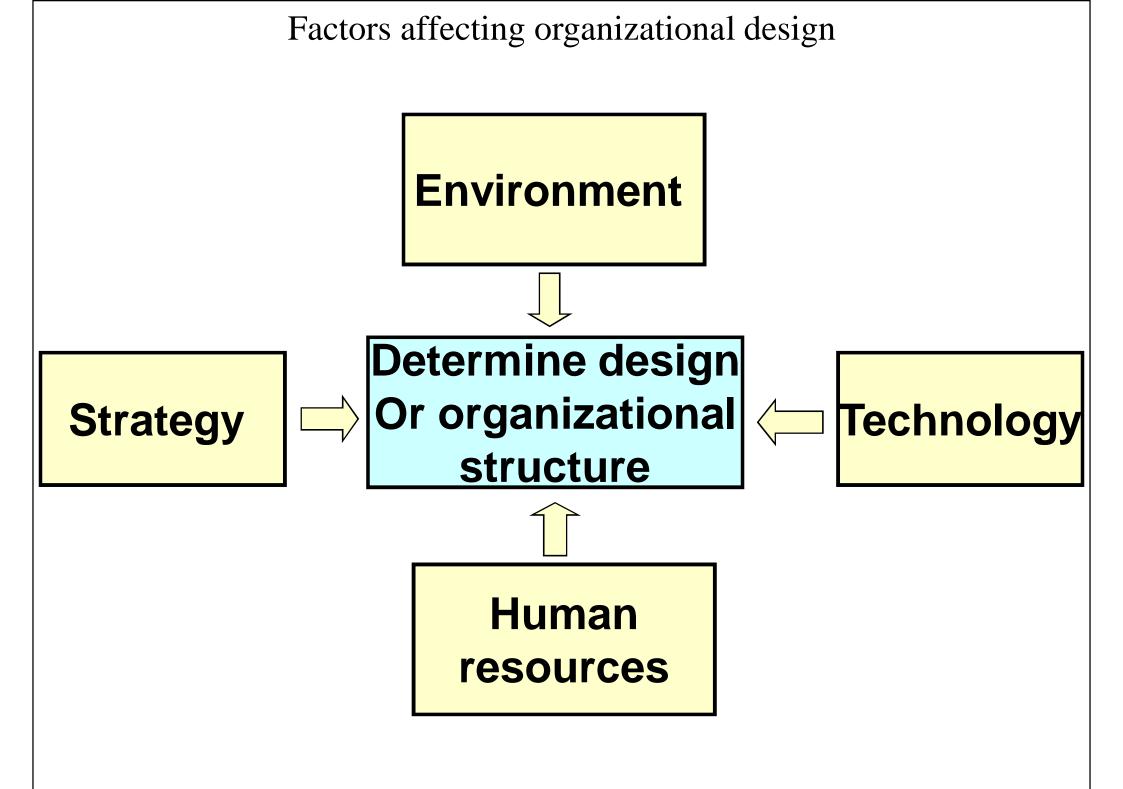
(Source: Morse, L. C. and Babcock, D. L., 2010. Managing Engineering and Technology, 5th ed.)

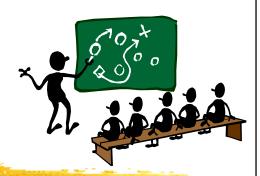
Basis of Structuring

- Line and staff relationships (cont'd)
 - <u>Functional</u>: Specialized authority
 - As binding as line authority
 - Usually procedural
 - Budget formats
 - Computer systems
 - Cafeteria

Basis of Structuring

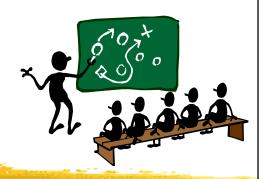
- Organizational structure issues
 - The roles are clearly and flexibly defined
 - Effective collaboration between units
 - Effective inter-unit and interpersonal linkages/cooperation
 - Clear lines of responsibility, authority and accountability
 - Decision making is sufficiently decentralized
 - Appropriate change management mechanism
- Factors to consider:
 - 1) Organization size, 2) Organization life cycle, 3) Strategy,
 4) Environment and 5) Technology



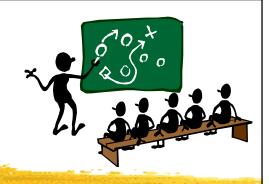


- Small group of people
- Serve interests of its members
- Exchange ideas freely and clearly
- Have common goals
- Committed to achieving goals
- Each team member treated equally

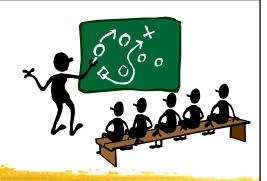




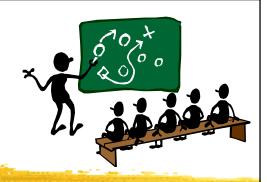
- Traditional product development sequence
 - 1. <u>Marketing</u> conducts research to identify customers' needs and defines product features (functionality, reliability, ease of repair, resale value, warranty, price, etc.)
 - 2. Design Engineering develops specifications, performs functional design, selects material, obtains vendor/supplier inputs, and conducts engineering analysis to create product features
 - 3. <u>Production Engineering</u> reviews and simplifies the product design for manufactureability and reliability considerations



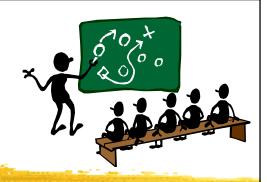
- Traditional product development sequence (cont'd)
 - **4.** <u>Service Organization</u> changes the design some more for serviceability
 - **5.** <u>**Production</u>** finally develops manufacturing techniques and makes the product</u>



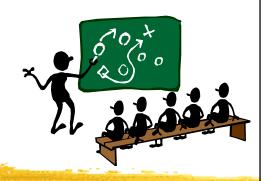
- Cross-functional product development team
 - Representatives of all functional groups are participating, in addition to procurement, financial, vendors/suppliers and customers
 - Issues related to product design/development are considered early on and concurrently
 - Create an optimum product in shortest time, at lowest cost, while satisfying constraints and meeting customers' needs



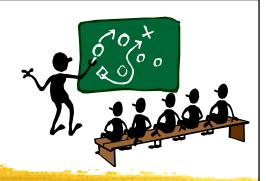
- Benefits of cross-functional teams
 - Reduction of product development time: 30% to 70%
 - Reduction of number of engineering changes: 65% to 90%
 - Reduction of time to market: 20% to 90%
 - Improvement in product quality: 200% to 600%



- Successful examples of concurrent teams
 - Mercury Computers, Lowell, MASS Reduced time to market from 125 days to 90 days for its add-on boards of VNE bus
 - Hewlett Packard, Palo Alto, CA Reduced the time to market by 2/3 for its 54600 Oscilloscope
 - Toyota Motors, Tokyo, Japan Reduced product cost by 61%
 - Medical Electronic Instruments Reduced the time to market from eight months to one

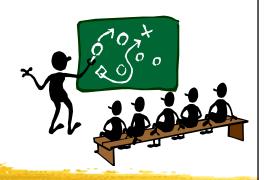


- <u>Team discipline</u>: For achieving "blow-the-roof-off" performance, teams must have discipline:
 - (1) Common purpose
 - (2) Specific goals of performance
 - (3) Complementary skills
 - (4) Commitment to how the work gets done (each pulling the same weight)
 - (5) Mutual accountability commitment and mutual trust, being accountable to each other - "being in the boat together"

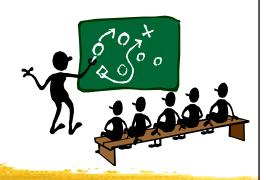


• Team learning

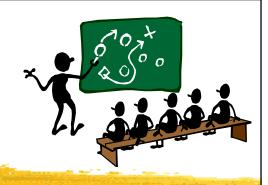
- Team must learn quickly all needed skills (process of working together, use of design tools, communications)
- Factors affecting team learning speed:
 - (1) Composition (a mix of expertise)
 - (2) Culture of risk taking allowing experimentation
 - (3) People-oriented leadership style



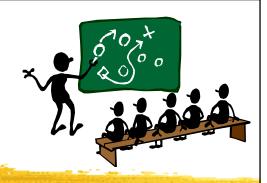
- Team effectiveness
 - <u>**Team Goals**</u> are clear, of high impact, measurable and with top management support
 - <u>Members</u> are results-oriented, efficient, having complementary skills and experience, high energy level, positive attitude to collaborate, each supported by staff with specific expertise
 - Work Environment is excellent (easy to use communications tools, opportunity for self-expression, pleasant work atmosphere, etc.)



- Roles of team members
 - 1. <u>Team Leader</u> Keeps team moving forward
 - 2. <u>Conceptual Thinker</u> Sources of original ideas, with imagination and vision
 - 3. <u>Harmonizers</u> Assuring team harmony, foster collaboration, resolving conflicts
 - 4. <u>Technicians</u> Specialists with expertise
 - 5. <u>Planners/implementers</u> Bring methods to tasks of team, autocrats with inflexibility
 - 6. <u>Facilitators</u> Offering help and support, being adaptable

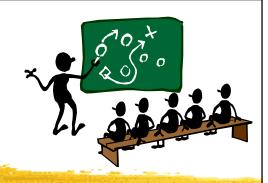


- Roles of team members (cont'd)
 - 7. <u>Critical Observers</u> Making sure the team is on target
 - **8.** <u>Radicals</u> Not accepting conventional thinking and solutions, offering new approaches to problem-solving
 - 9. <u>Power Seekers</u> Wanting to be right all the time, shaping the teams' view
 - **10.** <u>**Diplomats</u>** Coordinating inter-team relationship, getting information for the team</u>

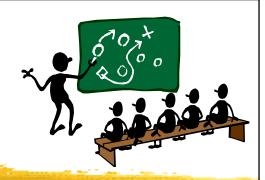


• Check team player <u>mentality</u>

- Do you compliment your co-workers when you observe them doing a good job?
- Are you enthusiastic about helping your teammates in any way you can?
- Do you always to do your job thoroughly and completely?
- Do you take advantage of every opportunity to support the team effort?
- Do you have a professional respect for everyone on your team?
- Can you follow through and support policies and rules with which you personally disagree?
- Do you attempt to avoid undermining those around you for personal gains?



- Check team player <u>mentality</u> (cont'd)
 - Are you enthusiastic about your company and the direction in which it is headed?
 - Do you show appreciation for the efforts of others and acknowledge their contributions to the big picture?
 - Do you seek new relationships and acquaintances through the company?
 - Do you take responsibility for your mistakes and easily admit when you are wrong?
 - Does your attitude have a positive effect on those around you?
 - Are you personally dedicated to making the company the best in the industry?



- Team stages
 - **Formation Stage** Members get together to have roles and responsibilities defined
 - <u>Gelling Stage</u> Members of like minds will form subgroups and stay close together
 - Unison Stage All team members are getting highly organized with a common goal





- Identify the skill base
- Estimate the number of personnel
- Plan recruiting policies
- Select the best applicants
- Orient and train applicants
- Evaluate performance
- Provide compensation





• New hires

- Establish the need for new hires
- Determine sources for new hires
 - New college graduates
 - Experienced professionals
 - Technician support
 - Other sources





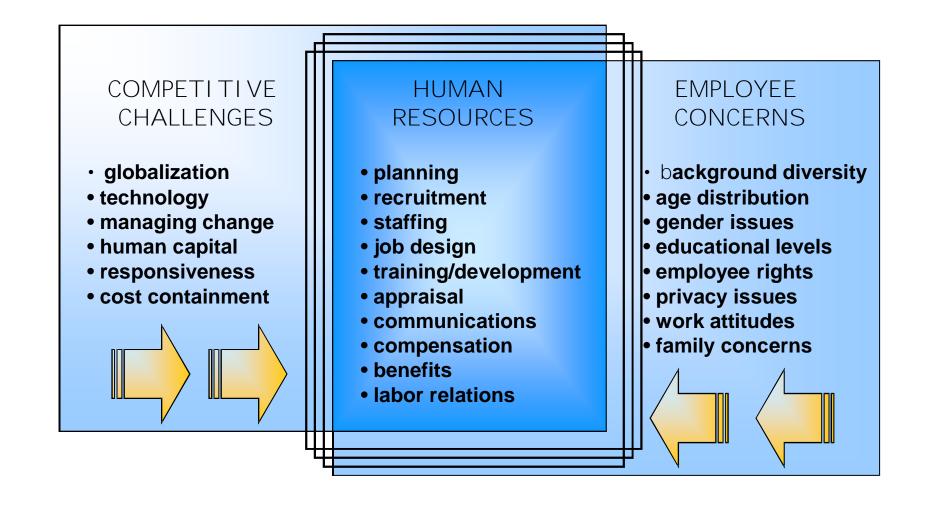
- Computer technology's impact on the work force
 - Factory workers will require a higher level of skills
 - Visualization
 - Conceptual thinking
 - Knowledge of production process
 - Statistical inference
 - Oral and visual communication
 - Attentiveness
 - Individual responsibility



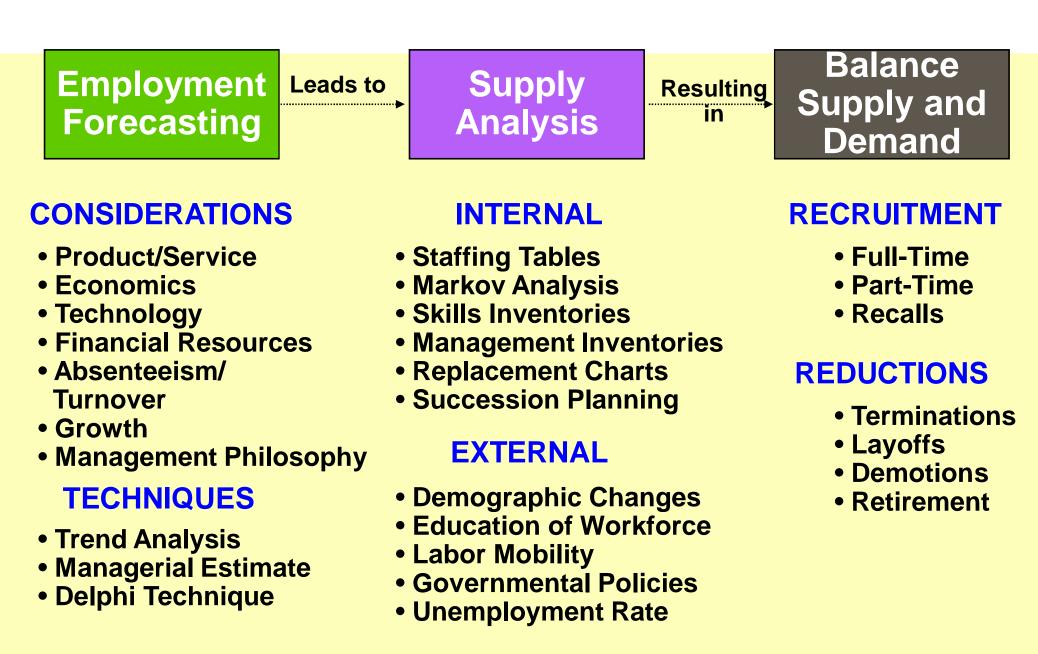


- Human resource (HR) planning
 - Selection: Usually involves several steps in a filtering process
 - Applications/Resumes reviewed
 - Interviews accomplished
 - References checked
 - Candidates passing initial screens formally interviewed
 - Job application process
 - Employee viewpoint
- Human resource management (HRM)

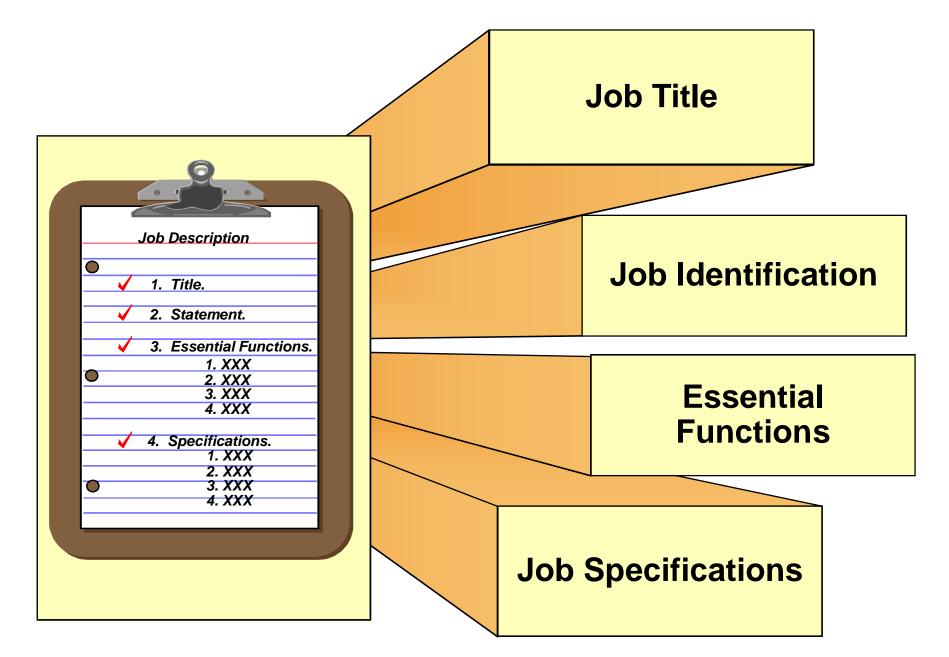
Overall framework for human resources management (HRM)



Human Resources Planning Model



Job Descriptions

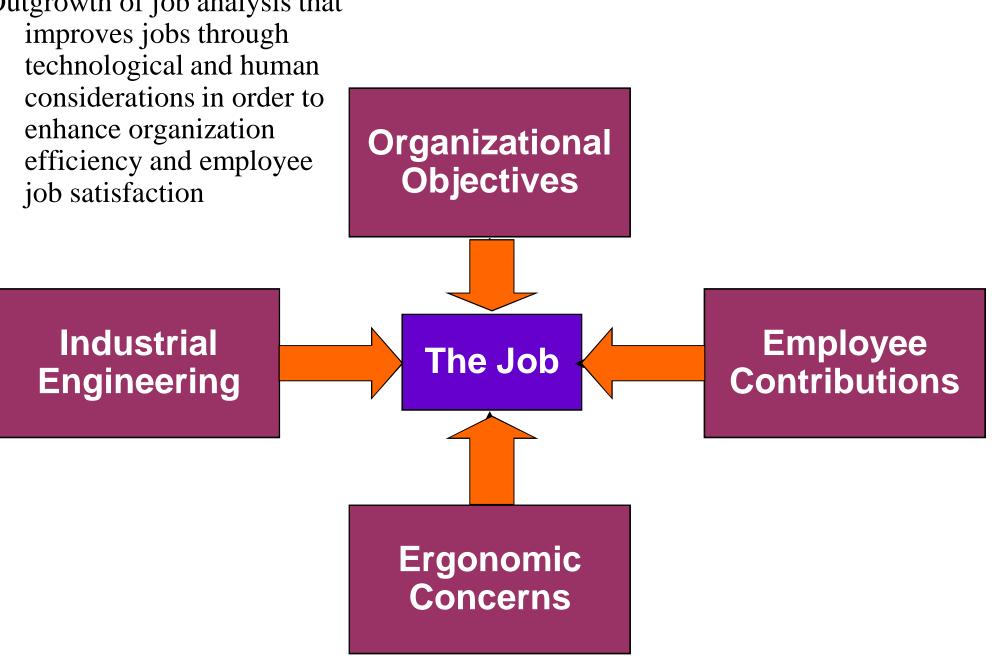




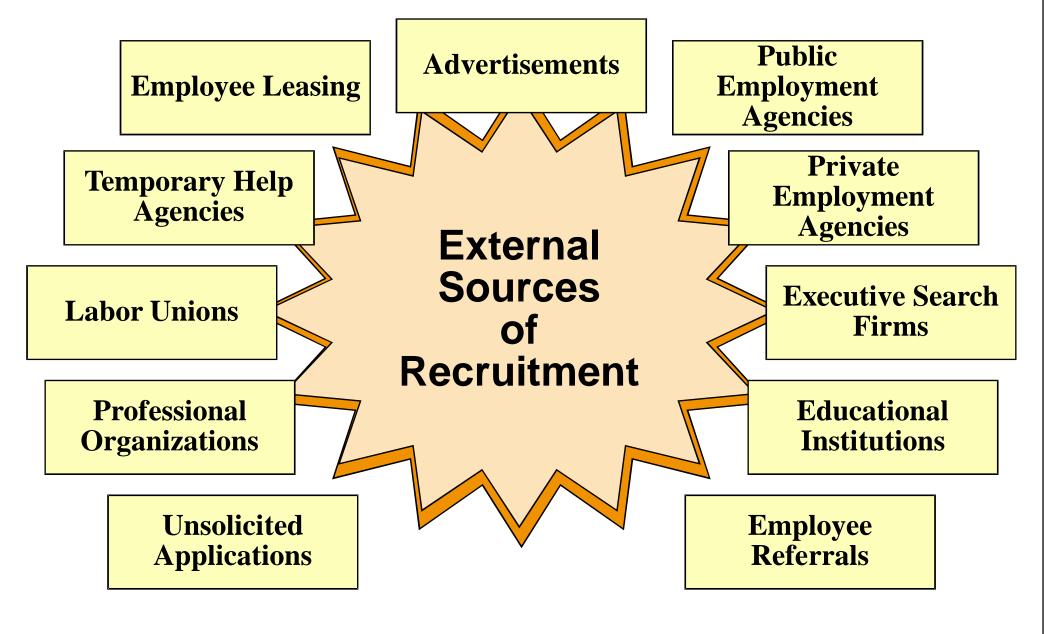
- Key elements of a job description
 - Job Title
 - Indicates job duties and organizational level
 - Job Identification
 - Distinguishes job from all other jobs
 - Essential Functions (Job Duties)
 - In the order of importance or time required
 - Indicate responsibilities entailed and results to be accomplished
 - Job Specifications
 - Skills required to perform the job
 - Physical demands of the job

Job Design

Outgrowth of job analysis that improves jobs through technological and human considerations in order to enhance organization efficiency and employee job satisfaction



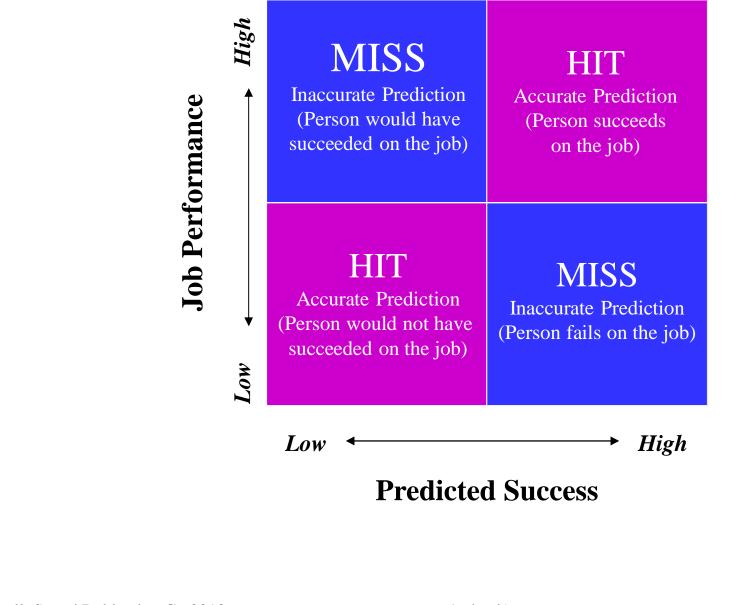
Recruitment





- Staff selection
 - The process of choosing individuals who have relevant qualifications to fill existing or projected job openings
- Skills assessment
 - <u>Hard skills</u> Technical capabilities readily assessed (transcripts, reports and references)
 - <u>Soft skills</u> Behavior in team work, interpersonal skills, leadership quality, cooperative attitude, mental flexibility and adaptability - all related to personality - psychological profile, value systems and deep-rooted beliefs are difficult to evaluate

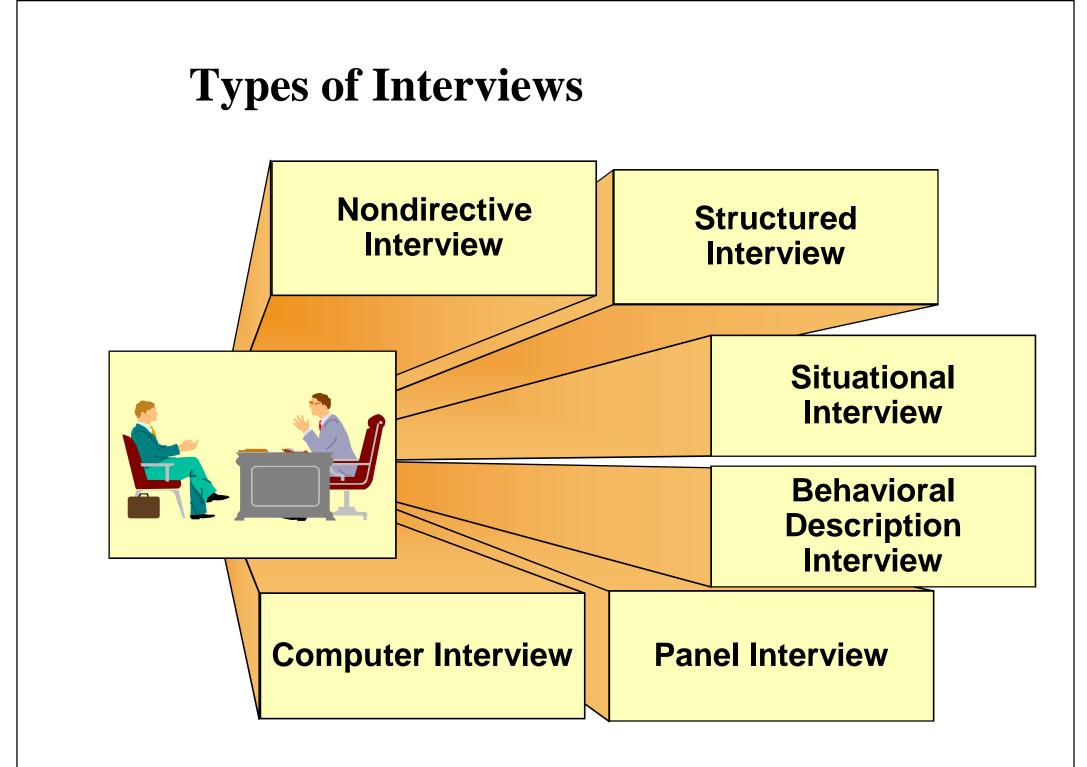
The Goal of Selection: Maximize "Hits"



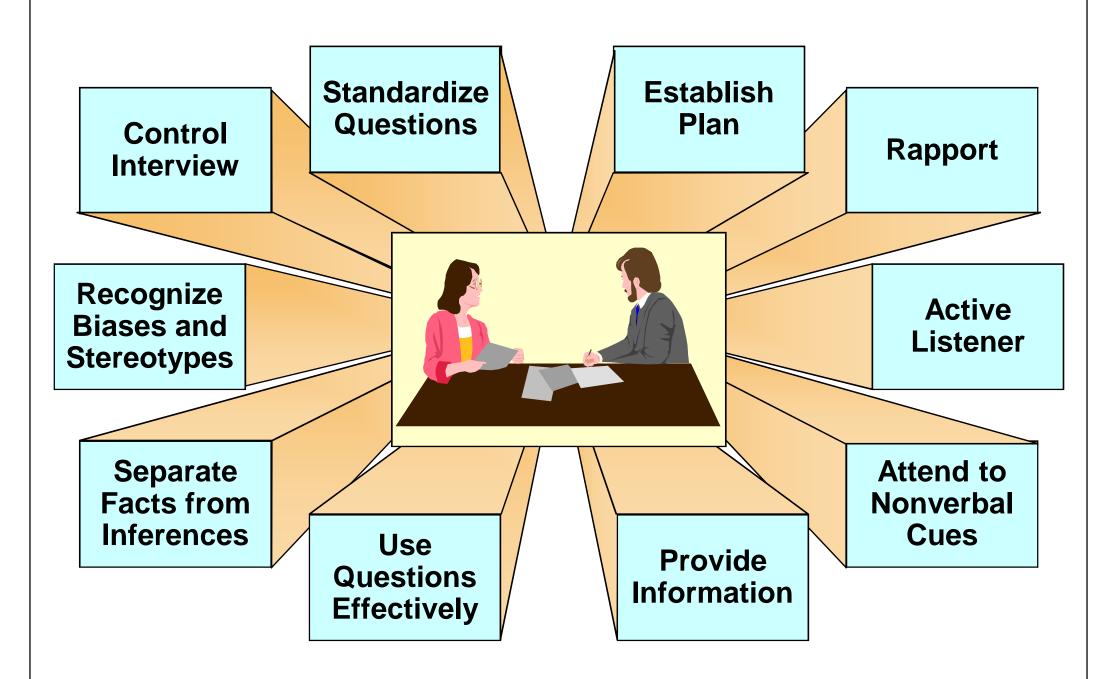
Steps in the Selection Process



Note: Steps may vary. An applicant may be rejected after any step in the process.



Guidelines for Employment Interviews



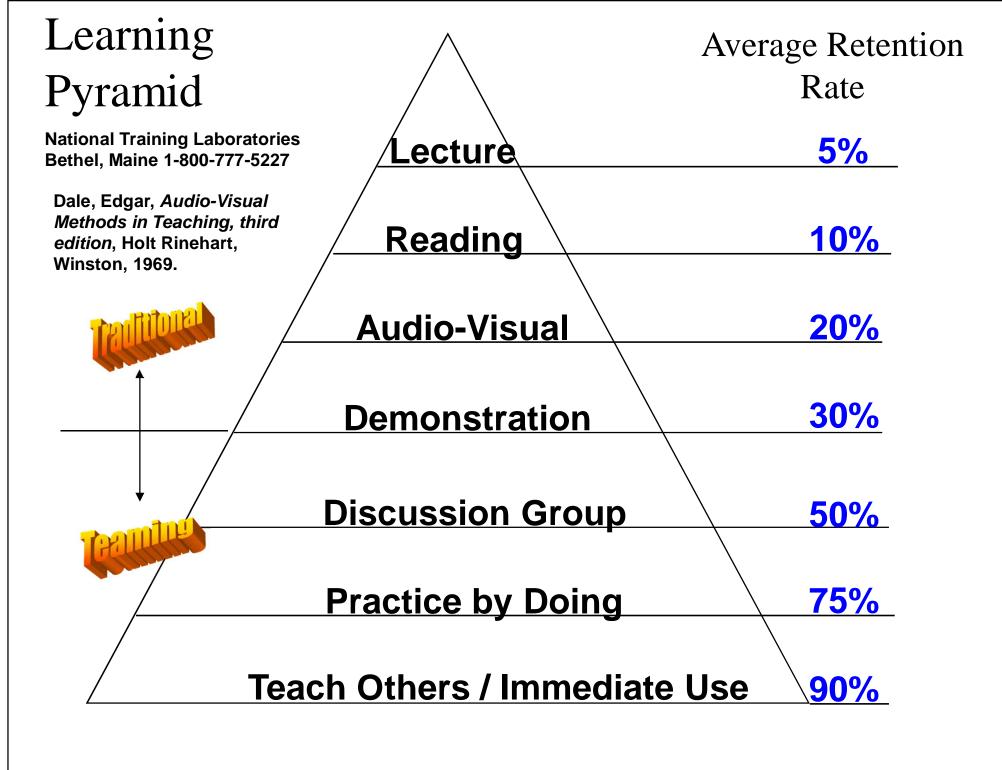
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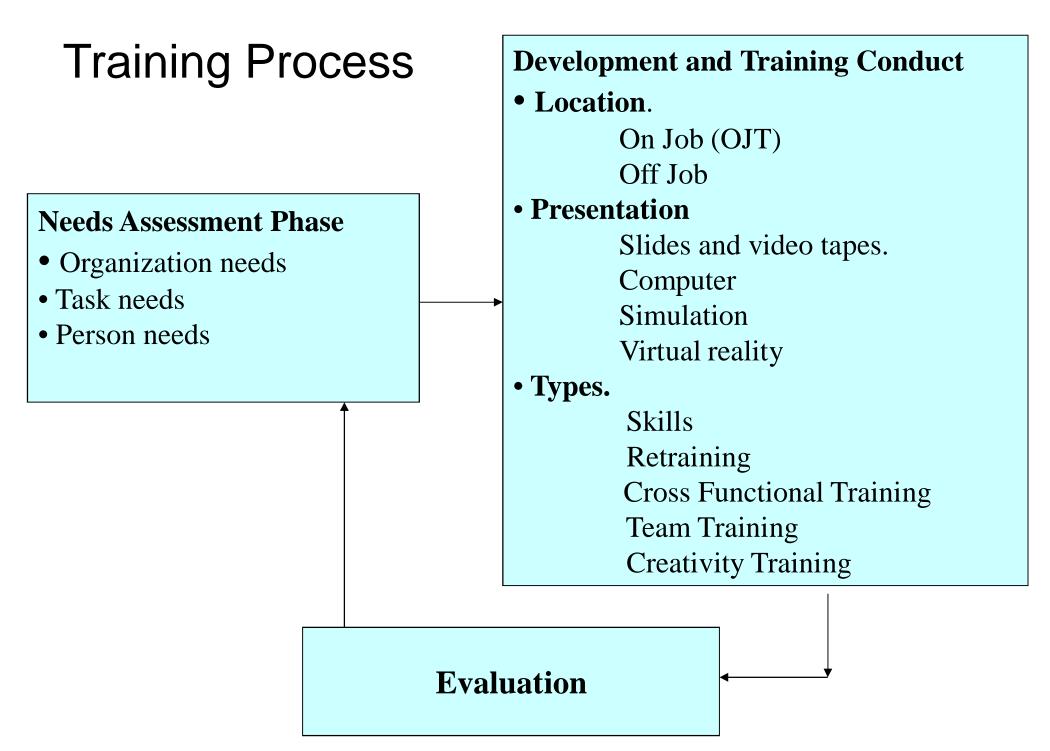
Staff Training & Development

• Training

- "A planned process to modify attitude, knowledge or skill behaviour through learning experience to achieve effective performance in an activity or range of activity. In order to satisfy the current and future needs of a project"
- Considerations to be taken:
 - Is training a solution for the problem?
 - Are the goals clear and realistic?
 - Is it a good investment?
 - Will it work?









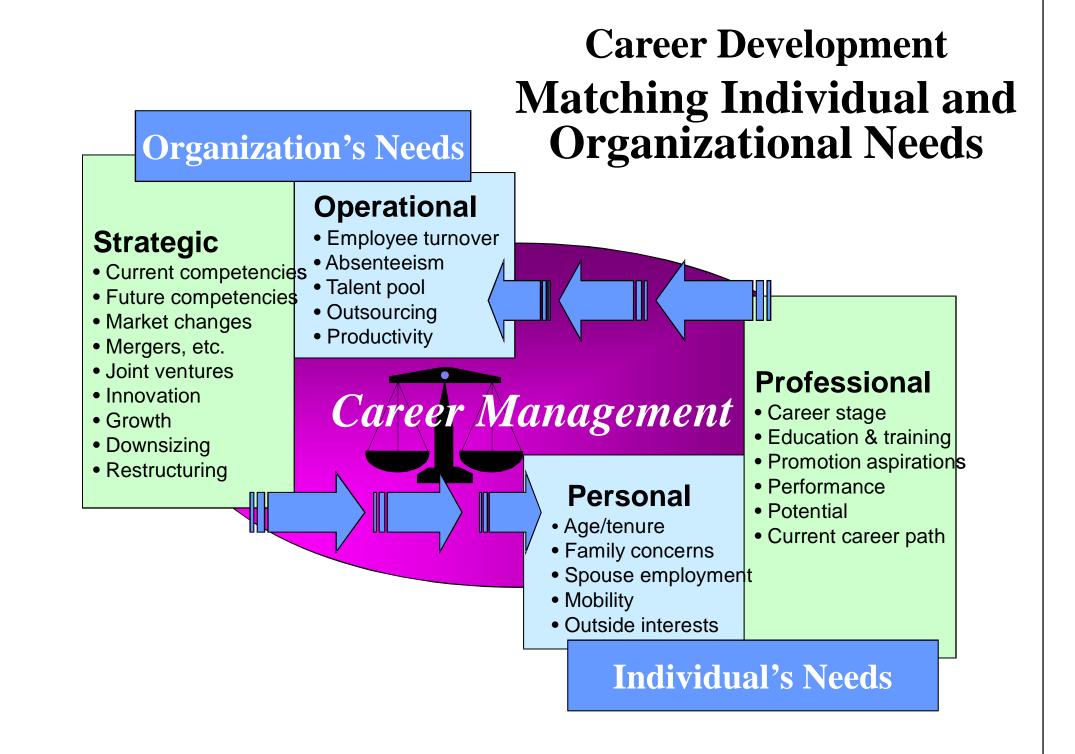
- Orientation and training
 - Helps newcomer become aware of organization and values
- Developing (of staff)
 - <u>Purpose</u>: To improve knowledge, attitude and skills of employees
 - <u>Knowledge</u>: Cognizance of facts, truths and other information
 - <u>Attitude</u>: Customary dispositions toward people, things, situations and information
 - <u>Skills</u>: Ability to perform specialized work with recognized competence

....

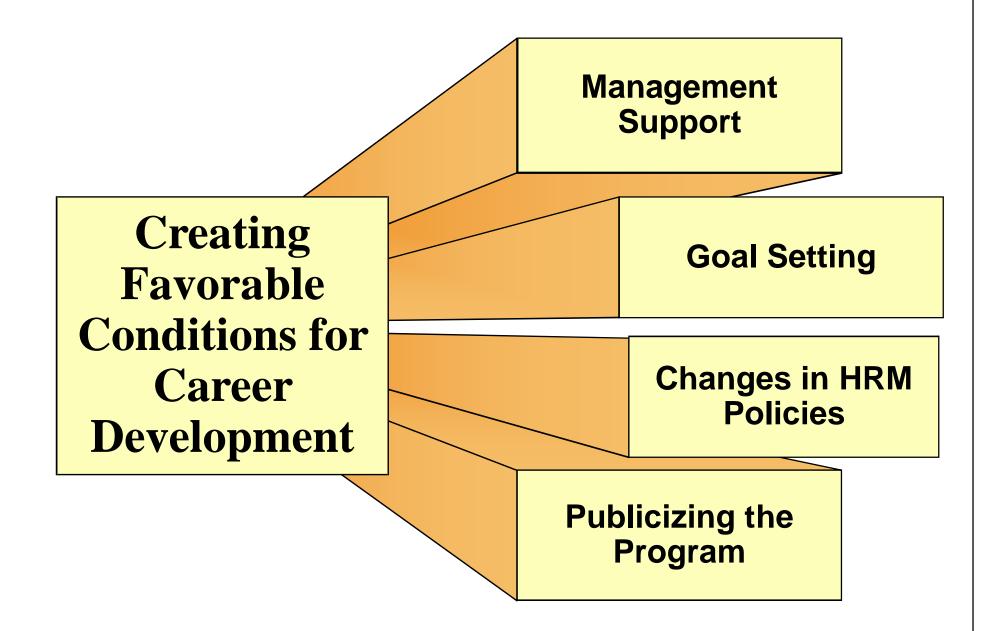
- Guidelines for employee development
 - <u>Emphasize</u> employee's role in development (good for the individual and company)
 - <u>Appraise</u> present performance and future potential
 - <u>Counsel</u> for improvement (to induce self-improvement, set example)
 - <u>Develop</u> successors career planning plan of some progressive companies



- Career development
 - Matching individual and organizational needs
 - Creating favorable conditions
 - Identifying job opportunities
 - Alternative career moves
 - HR's role in career development
 - Gauging employee potential
 - Career development programs
 - Mentoring functions
 - Stages of career development



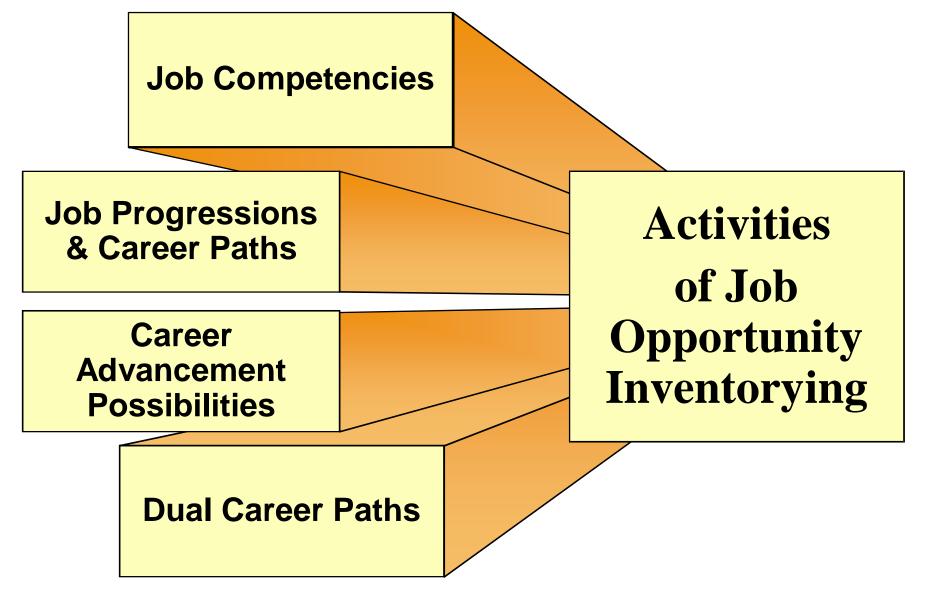
Career Development Creating Favorable Conditions

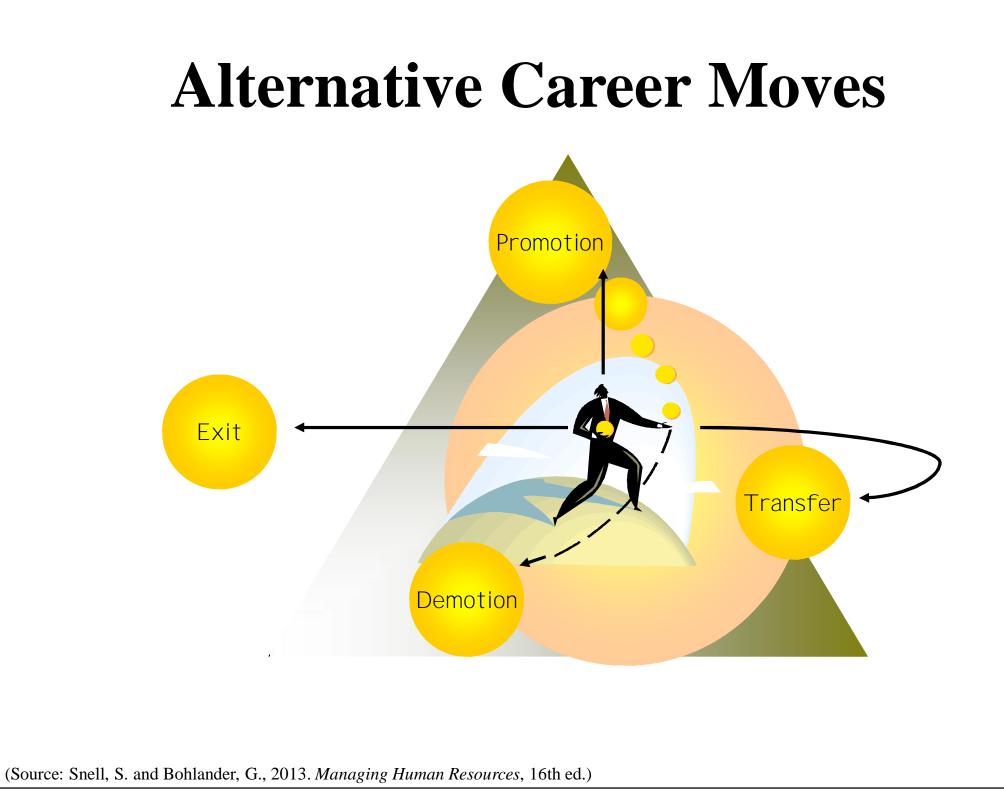




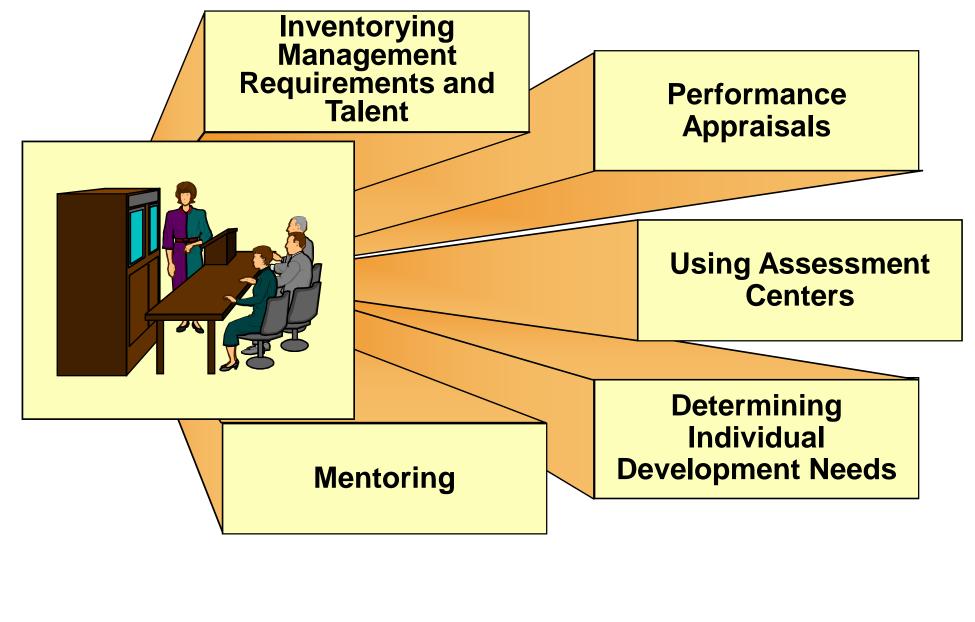
- Creating favorable conditions
 - Management participation
 - Provide top management support
 - Provide collaboration between line managers and HR managers
 - Train management personnel
 - Setting goals
 - Plan human resources strategy
 - Changing HR policies
 - Provide for job rotation
 - Provide outplacement service
 - Announcing the program
 - Explain its philosophy

Identifying Job Opportunities





Career Development Programs



Stages of Career Development

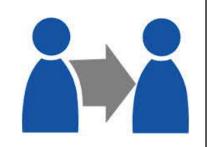
Stage 5: Late Career (ages 55-retirement): Remain productive in work, maintain self esteem, prepare for effective retirement.

Stage 4: Mid Career (ages 40–55): Reappraise early career & early adulthood, reaffirm or modify goals, make choices appropriate to middle adult years, remain productive.

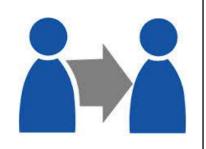
Stage 3: Early Career (ages 25-40): Learn job, learn organizational rules and norms, fit into chosen occupation and organization, increase competence, pursue goals.

Stage 2: Organizational Entry (ages 18-25): Obtain job offer(s) from desired organization(s), select appropriate job based on complete and accurate information.

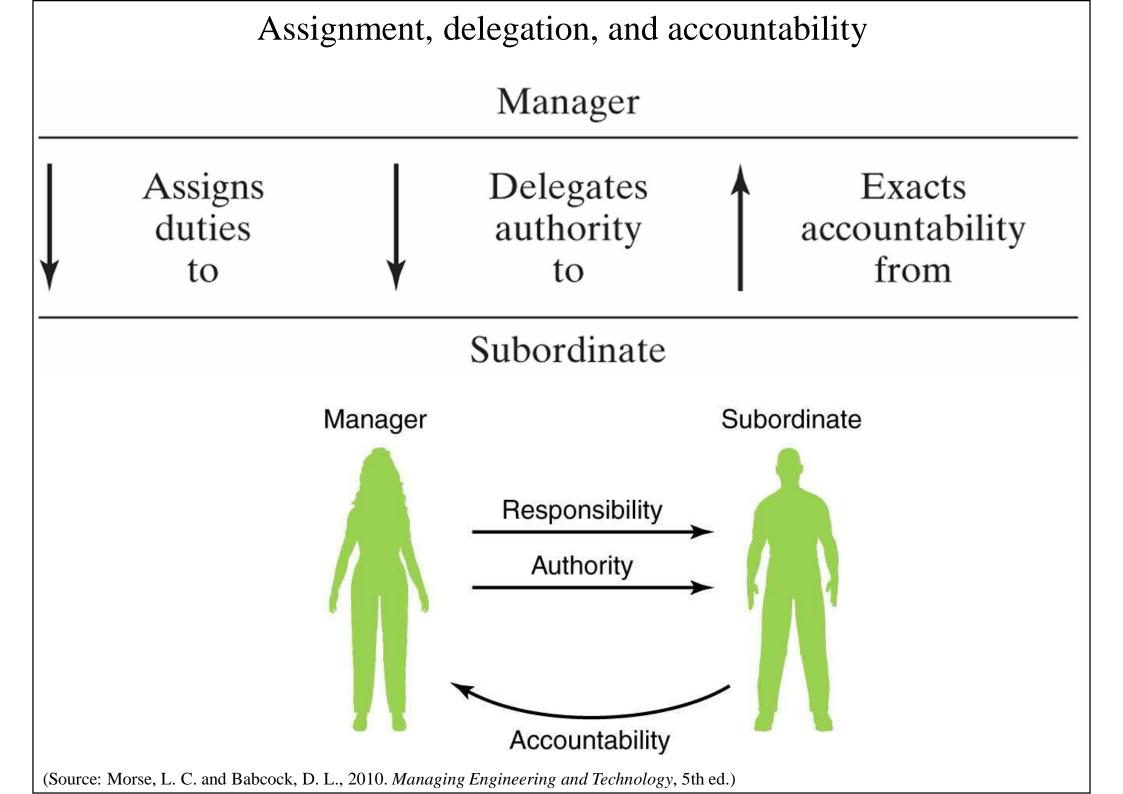
Stage 1: Preparation for Work (ages 0-25): Develop occupational self-image, assess alternative occupations, develop initial occupational choice, pursue necessary education.



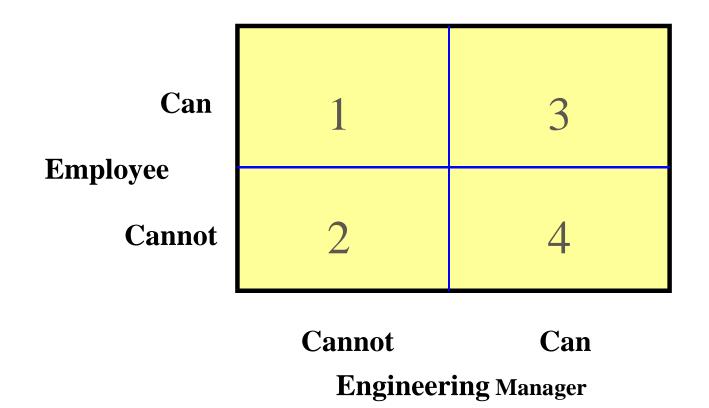
- <u>**Objective</u>** To improve manager's overall efficiency by selectively distributing work for employees to do</u>
- Process Managers delegate the responsibility and needed authority of doing specific work to employees and create upward accountability in them for securing the anticipated results
- Why delegating
 - <u>Improve</u> quality and quantity of work done
 - <u>Allow</u> manager to do manager's job
 - <u>Become</u> knowledgeable of employee's capabilities
 - <u>Distribute</u> work load efficiently/equitably



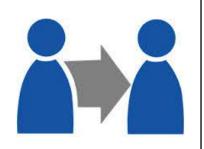
- Why delegating (cont'd)
 - <u>Develop</u> leadership capabilities in people
 - <u>Improve</u> operating decisions reducing cost
 - <u>Facilitate</u> teamwork, making job more satisfying to employees
 - <u>Create</u> opportunities for employees to gain recognition, encouragement and incentives
 - <u>Allow</u> employees to develop new skills and knowledge, fostering initiative and competence, and gaining self-confidence
 - <u>Encourage</u> employee growth/development



Delegation matrix

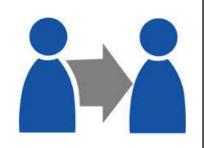


- 1: Employee
- 2: Neither; if must, then to be done by engineering manager
- **3: Employee**
- **4: Engineering manager**



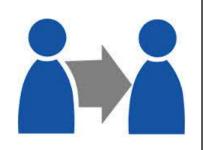
• What to delegate

- Problems/Issue requiring exploration, study and recommendation for decision making
- Activities coming within the job scope and capabilities of employee
- Tasks fitting company's needs and promoting employee development and growth
- Activities, if done right, would save manager's time



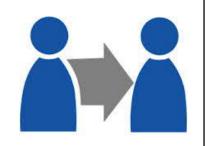
• What not to delegate

- Planning (to define the right things to do)
- Resolve morale problems, differences and conflicts in groups/units
- Coaching and developing employees
- Review, evaluate and correct performance
- Own assignments from big bosses
- Others (own "pet" projects, tasks absent of talents)



• How to delegate

- <u>Communicate</u> the importance of task, set goals and performance indicators, check on understanding/confidence
- <u>Delegate</u> responsibility for quality of work
- <u>Allow</u> operational decision making (resources, method, sequence of tasks, etc.)
- <u>Trust</u> the employee and give recognition
- <u>Retain</u> own upward accountability



• Barriers to delegation

- <u>Own technological obsolescence</u> Employee may learn and grow technically
- <u>Organizational barriers</u> unclear roles and responsibilities, line and staff positions
- Notes on delegation
 - Delegation is limited by control in effect no control, no delegation
 - Authority must be commensurate with responsibility and accountability
 - Willingness and ability of employee are keys

Further Reading

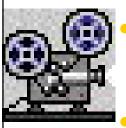


- Organizing in Business Management (video and texts)
 - http://education-portal.com/academy/topic/organizing.html
 - Organizing as a Function of Management (6:29)
 - Organizational Design and Structure (7:43)
 - Mechanistic & Organic Organizational Business Structures (7:12)
 - Work Specialization in Organizations (5:10)
 - Authority in Centralized & Decentralized Organizations (4:59)

Further Reading



- Organizing in Business Management (cont'd)
 - <u>http://education-portal.com/academy/topic/organizing.html</u>



- Types of Traditional Organizational Designs: Simple, Functional & Divisional Designs (7:46)
- Types of Contemporary Organizational Designs: Matrix, Team & Network Designs (8:41)
- Characteristics of Informal Organizations: The Grapevine & Informal Groups (5:52)
- Chapter Exam

Further Reading



- Human Resources (video and texts)
 - http://education-portal.com/academy/topic/human-resources.html



- Human Resource Management: Hiring and Staffing (9:25)
- The Hiring Process: How Human Resource Managers Recruit and Hire Employees (6:06)
- New Employee Orientation: Function & Characteristics (5:31)
- Assessing Training Needs of an Organization (5:50)
- Types of Employee Training Programs (5:53)
- Video: Steve Jobs talks about managing people (2:26)
 - http://www.youtube.com/watch?v=f60dheI4ARg