

MANUFACTURING PROCESSES (SME 2713)

Introduction 5

Dept. of Materials, Manufacturing and Industrial Engineering,
Faculty of Mechanical Engineering,
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1. Manufacturing Organization

1. Introduction
2. Organization Structures
3. Departmental Functions
4. Coordination within the organization

1. Introduction

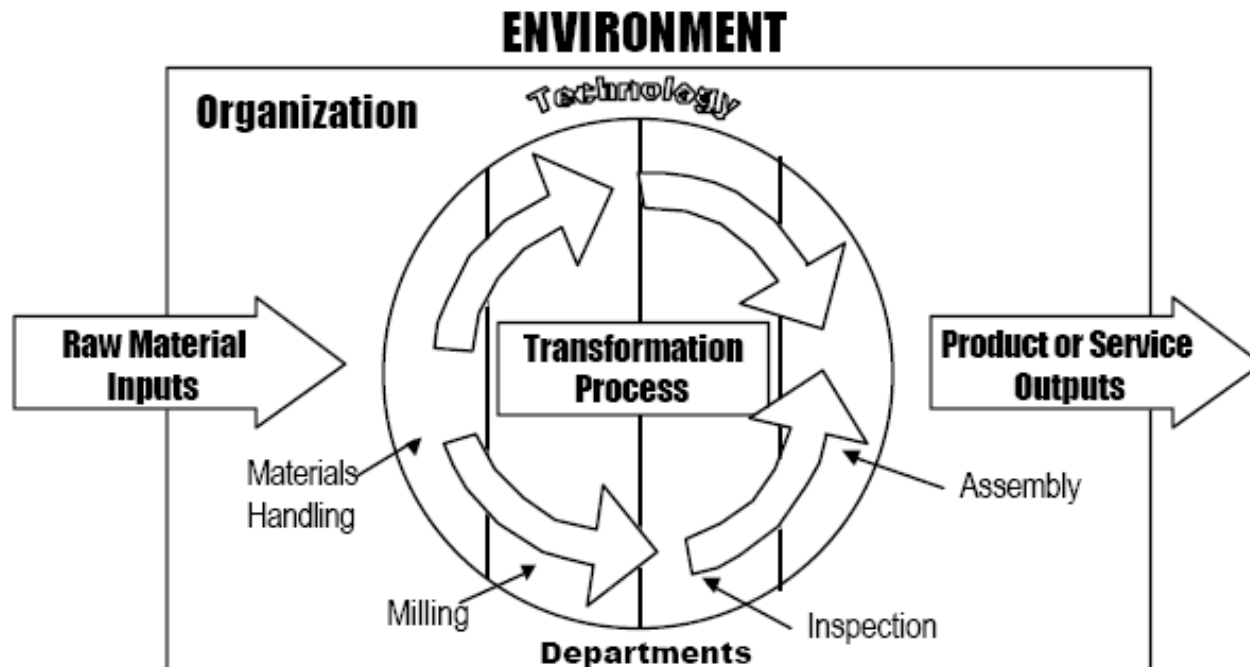
- **What is an organization?**
 - Social entity
 - Goal directed
 - Designed as deliberately structured and coordinated activity systems
 - Linked to external environment
 - Different sizes – small, medium, big

1. Introduction

- **Importance of Organization**
 - Bring together resources to achieve desired goals and outcomes
 - Produce goods and services efficiently
 - Facilitate innovation
 - Adapt to and influence a changing environment
 - Create values for owners, customers & employees

1. Introduction

- The **product or service output** can only be achieved efficiently & effectively if there exist a **good organization** which will facilitate the transformation process in the production system.

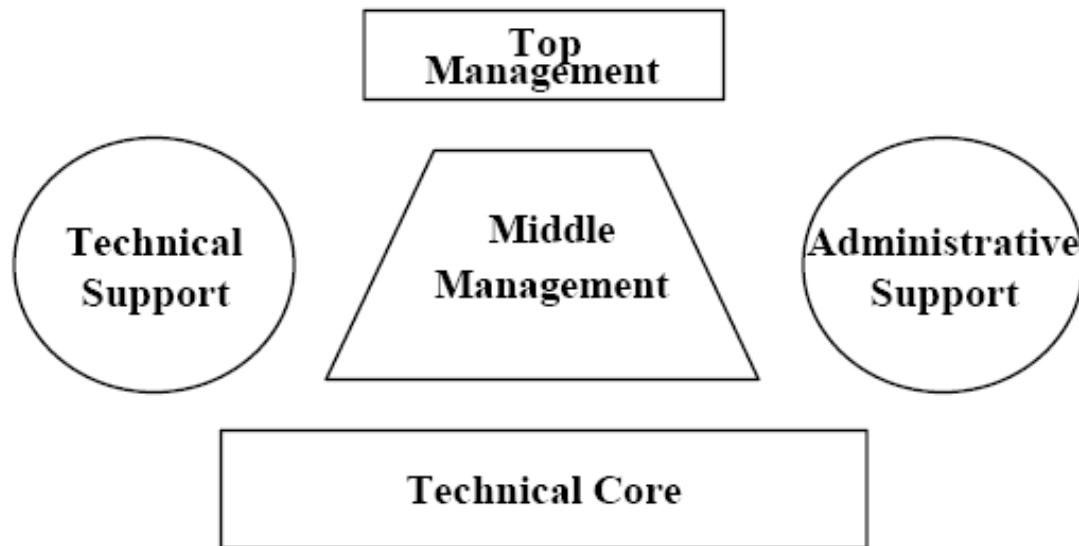


2. Organizational Structures

- The **formal** arrangement of jobs within an organization
- In the form of organizational chart
- Indicate communication, interaction among employees
- Indicate chain of command, job positions and reporting

2. Organizational Structures

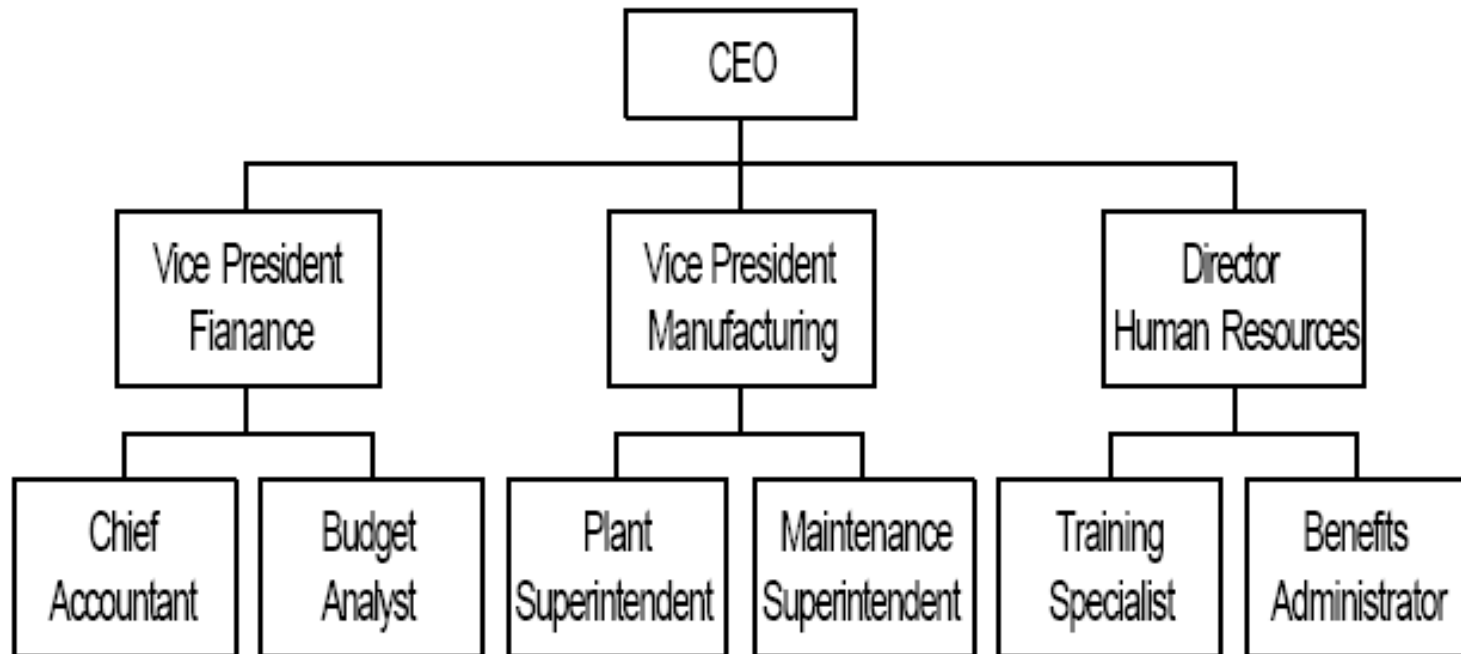
Five Basic Parts of an Organization



Source: Based on Henry Mintzberg, The Structuring of Organizations (Englewood Cliffs, N. J.: Prentice-Hall, 1979) 215-297; and Henry Mintzberg, "Organization Design: Fashion or Fit?" Harvard Business Review 59 (Jan. – Feb. 1981): 103-116.

2. Organizational Structures

A Sample Organization Chart



Board of Directors

Board of Directors:

Executives who are responsible for monitoring the activities of the firm's president and high level managers.

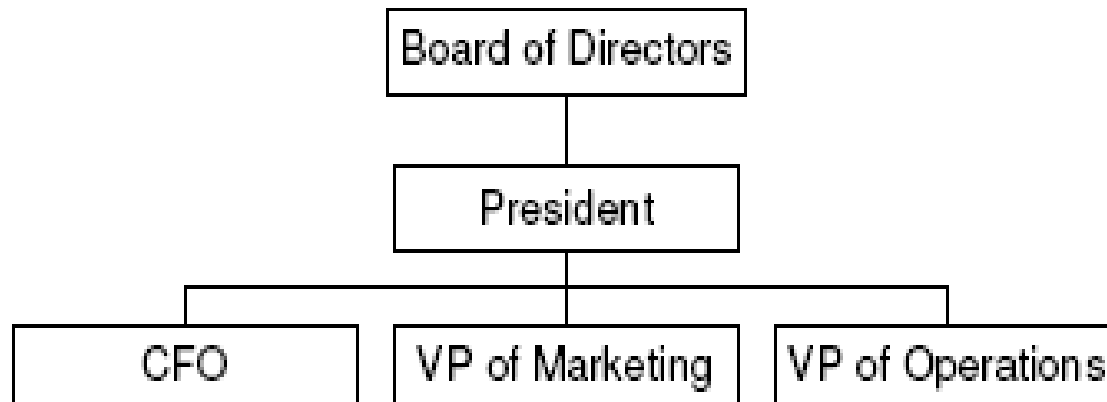
Types of Board Members:

↳ Inside board members

Also managers of the firm, such as the CEO

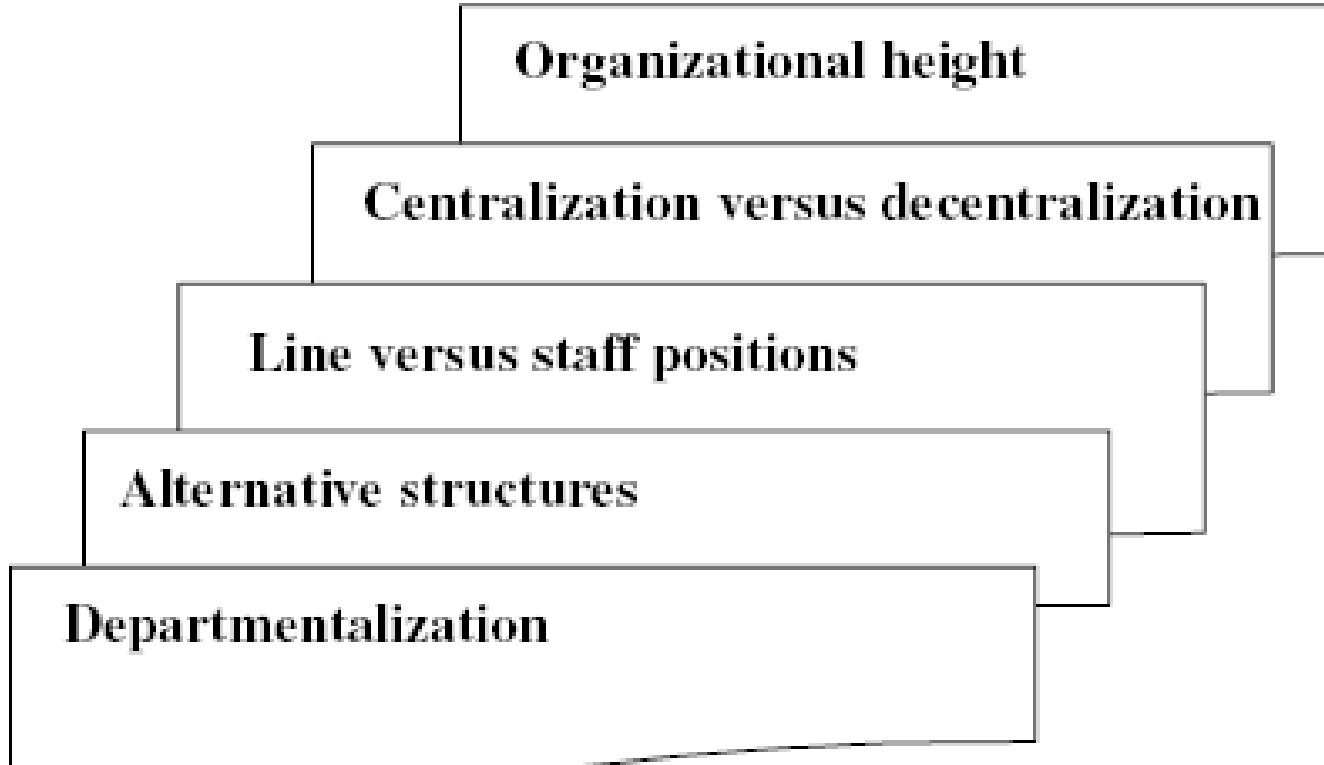
↳ Outside board members

High-level managers of other firms.



2. Organizational Structures

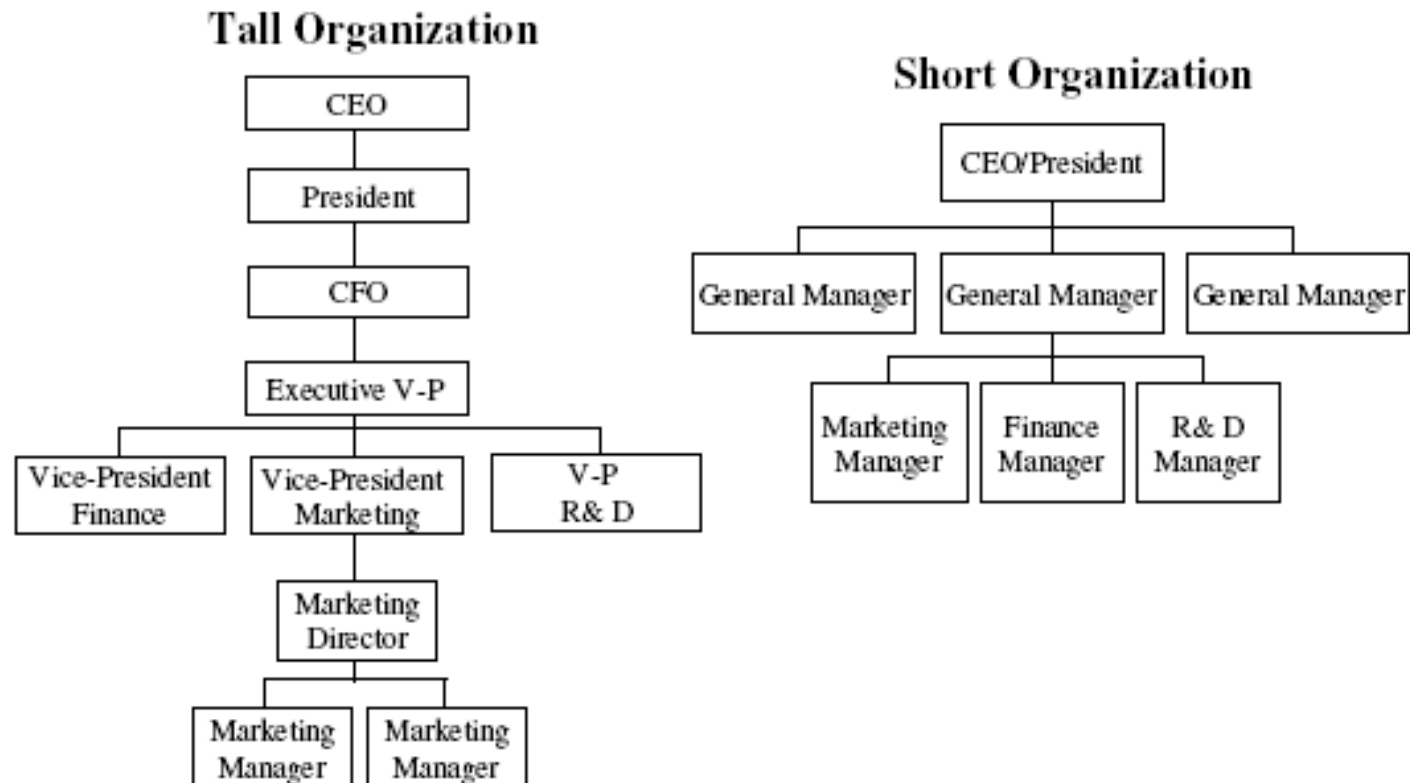
- **Elements of organizational structure**



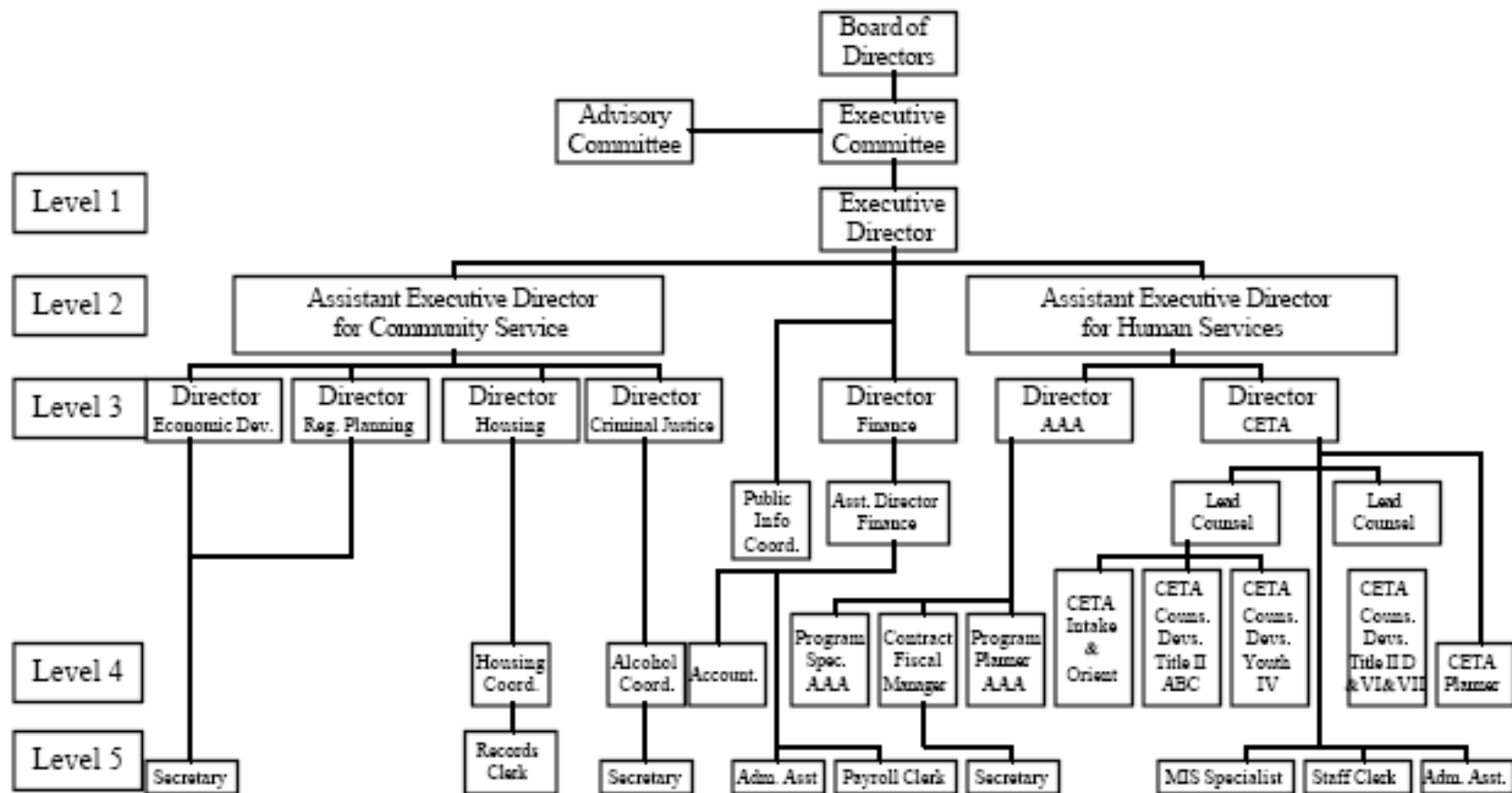
2. Organizational Structures

- **Organizational Height**

The number of layers from the top to the bottom of the organization.



Organization Chart Illustrating the Hierarchy of Authority for a Community Job Training Program



2. Organizational Structures

- **Span of control**

Narrow Span of Control



- ☒ Management determines the span of control.
- ☒ If performing similar tasks a wide span of control may be employed.

Wide Span of Control



2. Organizational Structures

- **Centralization vs decentralization**

Centralization:

- More control.
- Only experienced managers make decisions.
- Good for a firm with financial problems.

Decentralization:

- Reduces operating expenses
- Faster decision-making.
- Motivates employees.

2. Organizational Structures

Comparison of Line and Line and Staff



Simplest form:

May be appropriate for businesses that cannot afford to hire support staff positions.



Line positions:

- Make decisions that achieve specific business goals.

Staff positions:

- Support the efforts of line positions

2. Organizational Structures

- **Alternative structures**
 - Matrix Organization
 - Intreprenneurship

2. Organizational Structures

Matrix Organization

Interaction among various parts of the firm to focus on specific projects.

Advantages:

- Variety of skills and talent.
- Participation in decision-making.
- Greater employee satisfaction.

Disadvantages:

- Potential lack of accountability.
- Time used to participate in projects reduces time for normal tasks.
- Employees have two bosses.

2. Organizational Structures

Intrapreneurship

Employees are assigned to create ideas as if they were entrepreneurs.

Advantage:

- Innovative thinking occurs.

Disadvantage:

- Pulls employees away from normal duties.

2. Organizational Structures

- **Departmentalization** – the creation of departments which will handle assigned tasks
 - By function
 - By product
 - By location
 - By customer

Strengths and Weaknesses of Functional Organization Structure

Ω **STRENGTHS:**

- **Allows economies of scale within functional departments**
- **Enables in-depth knowledge and skill development**
- **Enables organization to accomplish functional goals**
- **Is best with only one or few products**

Ω **WEAKNESSES:**

- **Slow response time to environmental changes**
- **May cause decisions to pile on top, hierarchy overload**
- **Leads to poor horizontal coordination among departments**
- **Results in less innovation**
- **Involves restricted view of organizational goals**

Source: Adapted from Robert Duncan, "What Is the Right Organization Structure? Decision Tree Analysis Provides the Answer," Organizational Dynamics (Winter 1979): 429.

Strengths and Weaknesses of Divisional Organization Structure

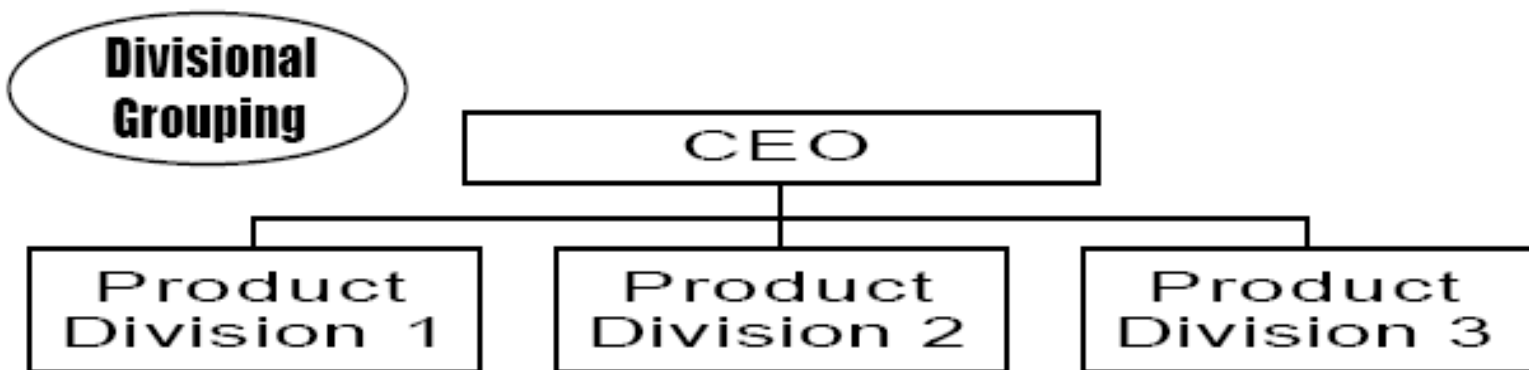
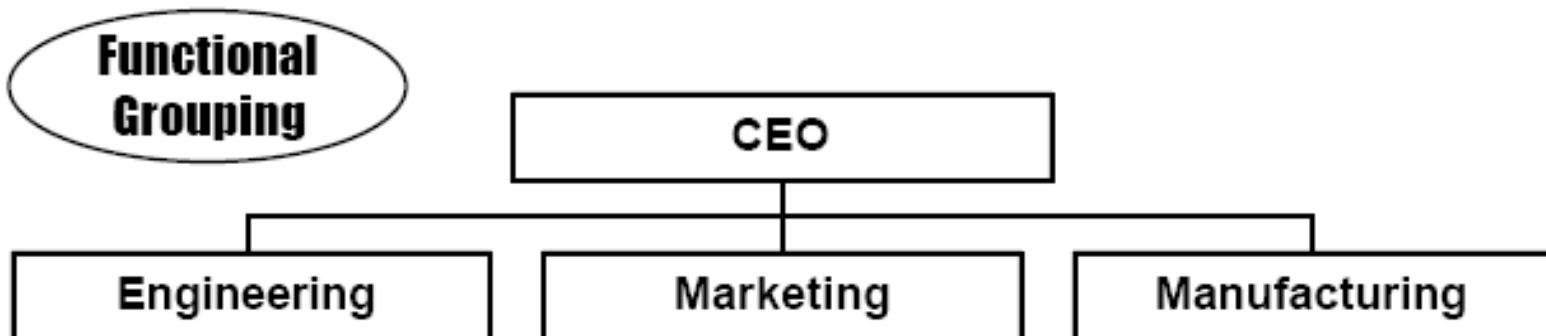
Ω **STRENGTHS:**

- **Suited to fast change in unstable environment**
- **Leads to client satisfaction because product responsibility and contact points are clear**
- **Involves high coordination across functions**
- **Allows units to adapt to differences in products, regions, clients**
- **Best in large organizations with several products**
- **Decentralizes decision-making**

Ω **WEAKNESSES:**

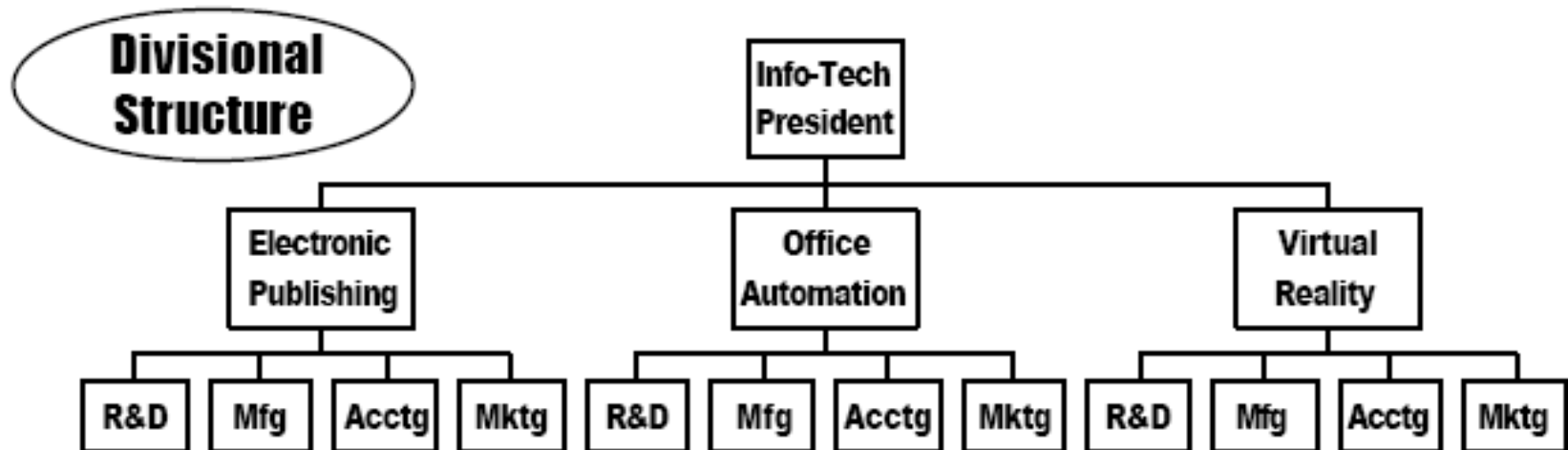
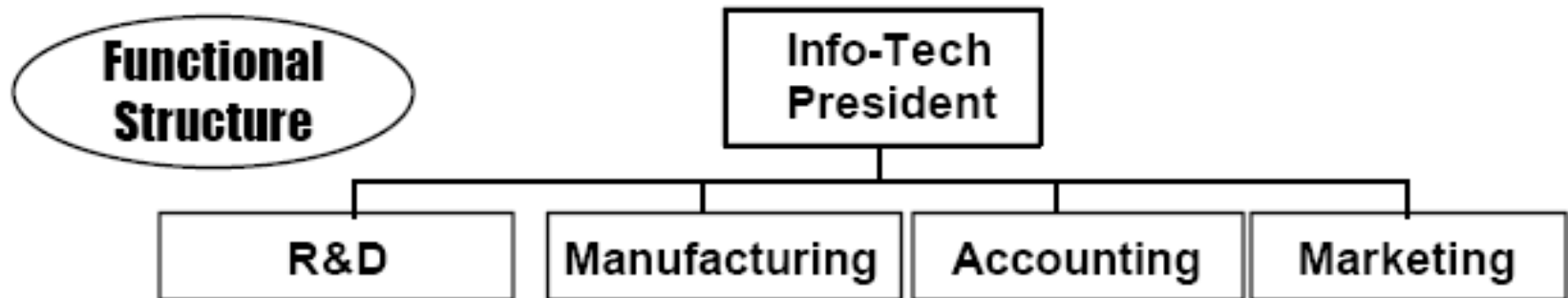
- **Eliminates economies of scale in functional departments**
- **Leads to poor coordination across product lines**
- **Eliminates in-depth competence and technical specialization**
- **Makes integration and standardization across product lines difficult**

Structural Design Options for Grouping Employees into Departments

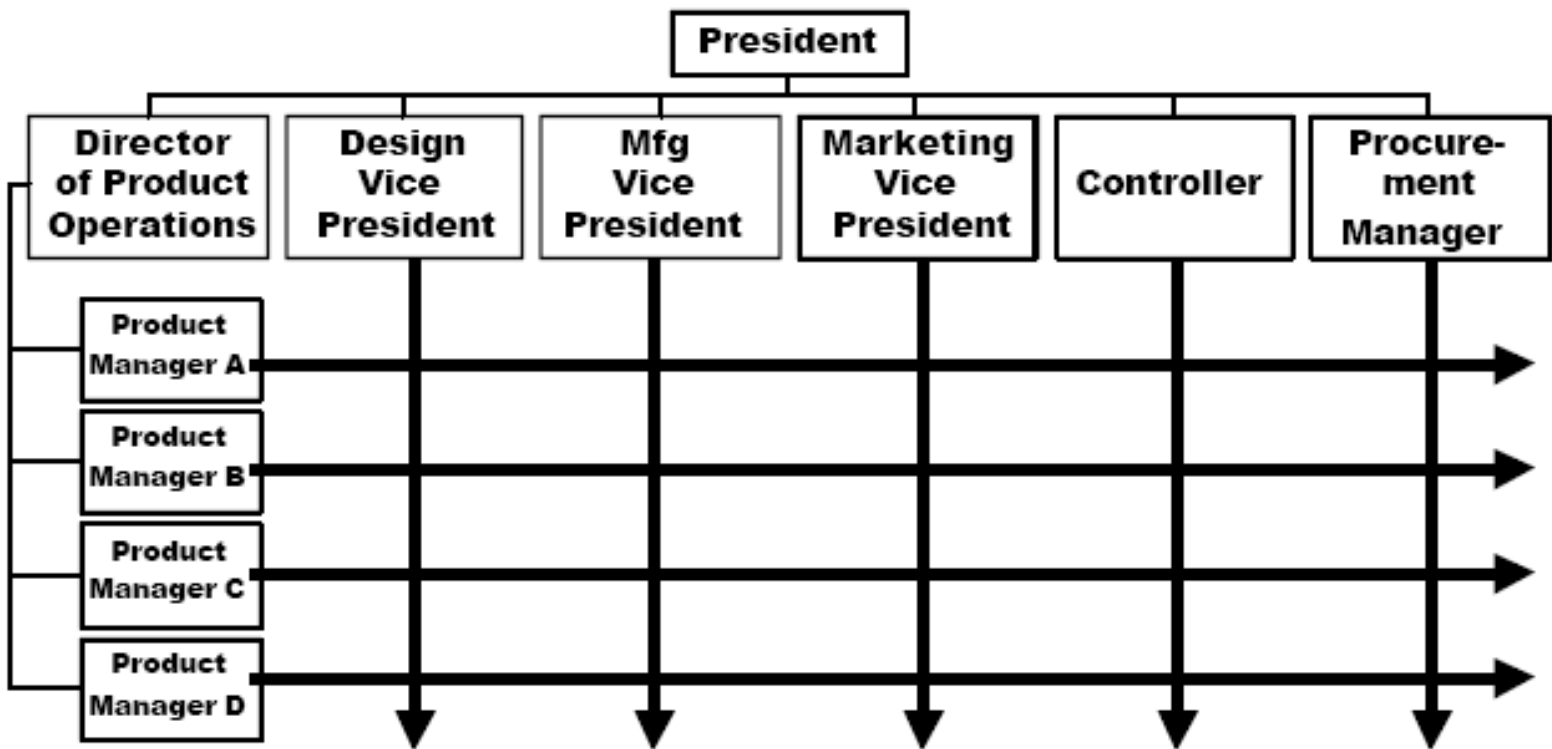


Source: Adapted from David Nadler and Michael Tushman, *Strategic Organization Design* (Glenview, Ill.: Scott Foresman, 1988), 68.

Reorganization from Functional Structure to Divisional Structure at Info-Tech



Dual-Authority Structure in a Matrix Organization



Strengths and Weaknesses of Matrix Organization Structure

Ω STRENGTHS:

- **Achieves coordination necessary to meet dual demands from customers**
- **Flexible sharing of human resources across products**
- **Suited to complex decisions and frequent changes in unstable environment**
- **Provides opportunity for both functional and product skill development**
- **Best in medium-sized organizations with multiple products**

Ω WEAKNESSES:

- **Causes participants to experience dual authority, which can be frustrating and confusing**
- **Means participants need good interpersonal skills and extensive training**
- **Is time consuming; involves frequent meetings and conflict resolution sessions**
- **Will not work unless participants understand it and adopt collegial rather than vertical-type relationships**
- **Requires great effort to maintain power balance**

3. Departmental Functions

- **Fungsi pemasaran dan jualan**
 - Memberi arahan untuk menghasilkan produk – berapa jumlah, bila dan jenisnya.
 - Arahan berasaskan permintaan/tempahan khusus pembeli atau ramalan jualan.
 - Memasarkan produk – melaksanakan strategi pemasaran tertentu, pengiklanan
 - Bersama pihak jualan, menjual produk yang dihasilkan

3. Departmental Functions

- **Fungsi reka bentuk produk**
 - Melakukan kerja reka bentuk dan pembangunan produk
 - Reka bentuk diberikan pengguna atau dihasilkan sendiri
 - Bersama jabatan lain terutama kejuruteraan pembuatan membincangkan perincian produk – kebolehasilan, kos, alternatif proses & bahan, dll

3. Departmental Functions

- **Fungsi kejuruteraan pembuatan**
 - Khidmat nasihat kepakaran kepada jabatan rekabentuk berkaitan kebolehasilan
 - Merancang jujukan proses, pilihan alternatif proses & bahan, jenis & kapasiti mesin
 - Spesifikasi perkakas, - jig, lekapan, die, acuan. Memutuskan merekabentuk dan bina sendiri atau membeli daripada pembekal luar.
 - Menyelesaikan masalah pengeluaran produk seperti kerosakan mesin, kurang tepat, masalah kualiti dan seumpamanya.

3. Departmental Functions

- **Fungsi kejuruteraan industri**
 - Menentukan cara kerja, piawaian masa/proses (SOP).
 - Mempastikan keselesaan dan keselamatan tempat kerja – kebisingan, suhu, lantai, pencahayaan yang cukup dan seumpamanya.
 - Menyusun atur loji/peralatan
 - Meningkatkan daya pengeluaran

3. Departmental Functions

- **Fungsi perancangan dan kawalan pengeluaran**
 - Membuat jadual induk penghasilan produk – kuantiti yang perlu dihasilkan, dan bila perlu disiapkan
 - Merancang keperluan lain berdasarkan jadual induk – bahan mentah, komponen yang diperlukan, mesin, tenaga kerja, dan lain-lain perkhidmatan yang diperlukan
 - Membuat jadual pengeluaran, pemberhentian mesin/servis.

3. Departmental Functions

- **Fungsi pembuatan/pengeluaran**
 - Melaksanakan aktiviti pengeluaran – proses pembuatan dari mula hingga selesai, pengendalian bahan, pengelenggaraan dan baik pulih.
 - Bersama pihak kejuruteraan pembuatan, kejuruteraan industri dan kawalan kualiti, memastikan peralatan/mesin berfungsi dengan baik dan terjamin kualiti produk yang dihasilkan.

3. Departmental Functions

- **Fungsi kawalan kualiti**
 - Mempastikan produk berkualiti, menepati spesifikasi/piawaian yang ditentukan
 - Merancang sistem kawalan kualiti yang sesuai
 - Melaksanakan kerja-kerja memeriksa kualiti bahan mentah, sedang diproses dan produk siap.

3. Departmental Functions

- **Fungsi pengedaran**

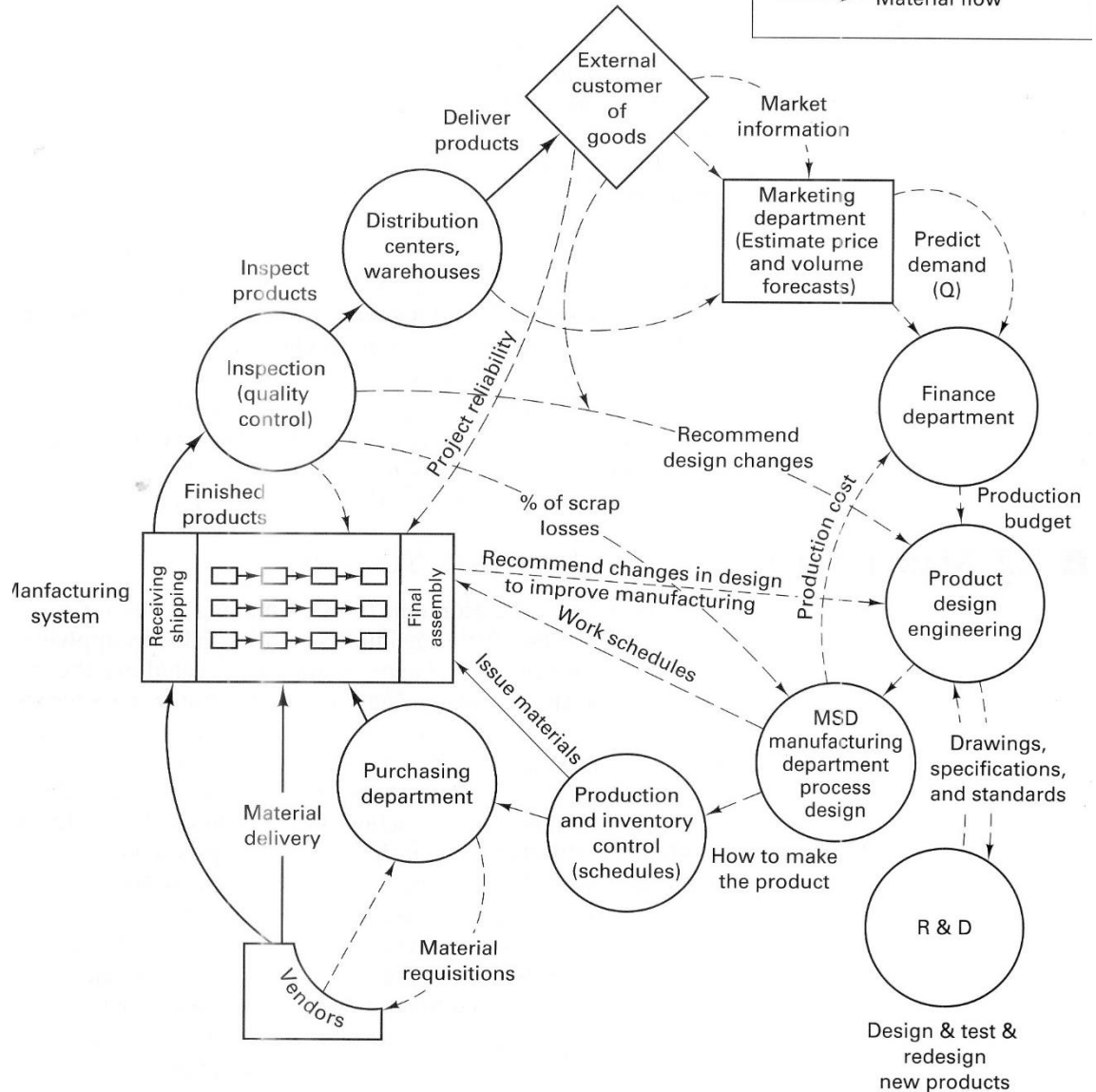
- Urusan pergudangan, pengedaran dan penghantaran produk kepada pengguna
- Inventori produk siap, berurusan dengan pihak pemasaran dan jualan dengan penghantaran produk.

4. Organizational Coordination

- Koordinasi di antara pelbagai fungsi jabatan bagi mencapai matlamat utama syarikat iaitu penghasilan produk secara cekap dan berkesan, menguntungkan, dan memenuhi kehendak pengguna.

4. Organizational Coordination

The functions and systems of the production system, which includes the manufacturing system. The functional departments are connected by formal and informal information systems designed to service the manufacturing system that produces the goods



4. Organizational Coordination

