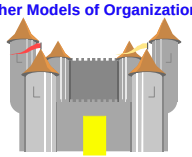
II. Organizations

Organizational Goals and Objectives
Organizations as Systems
Product Flow vs Information Flow
Organization Charts
Feedback and Control within Organizations
Information Systems Departments
Business Processes
Other Models of Organizations



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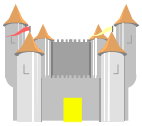
Organizations

- A **(business) organization** is a social structure with an associated purpose, such as providing services or generating products.
- Organizations can be understood as composite systems intended to achieve organizational goals and objectives.
- There are two basic types of organizations:
  - Production organizations -- such as manufacturing, farming, construction and agriculture.
  - Service organizations -- such as trasportation, communication, banking and finance, medicine, education and retailing.



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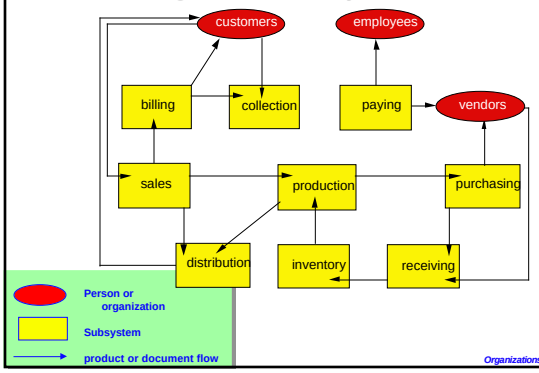
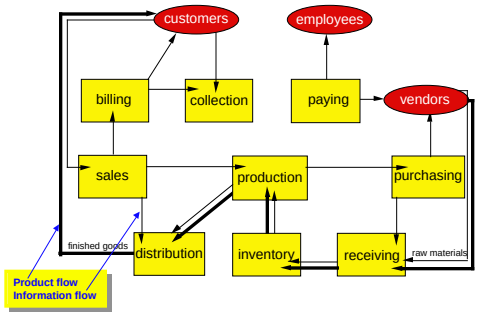
Organizations as Systems



Product Flow vs Information Flow



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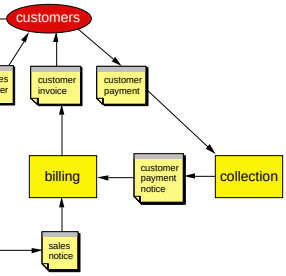
Information Flow Through Documents

This is the type of information flow a systems analyst has to understand to perform her task!



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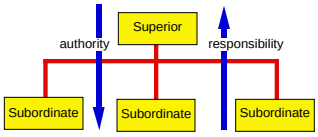
The Organization Chart

The **organization chart** defines areas of responsibility and lines of authority within an organization.



- Strictly hierarchical organizations do not perform as well as organizations that are based on other organizational structures.
- Heterarchical relationships "cut across" departments to make decisions more democratic, and functioning of the organization less bureaucratic

These charts are essential for systems analysis!

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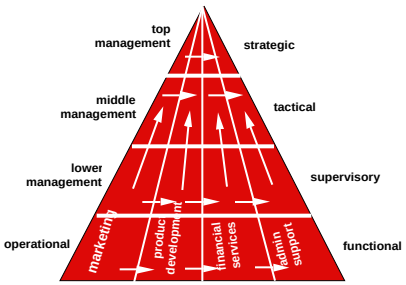
Levels of Authority

- **Top management** -- establishes goals, does long-range planning, determines new market and product developments, decides on mergers and acquisitions.
- **Middle management** -- sets objectives, allocates and controls resources, does planning and measures performance
- **Lower management** -- supervises day-to-day operations, takes corrective action when necessary.
- **Operational level** -- performs day-to-day operations

Vertical vs Horizontal Integration

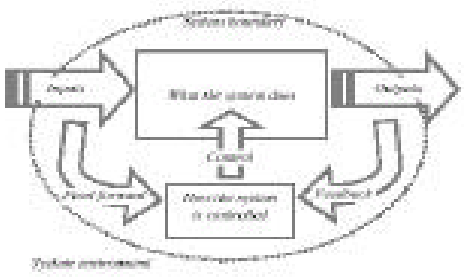


Information systems play a crucial role in this integration

General Systems Theory

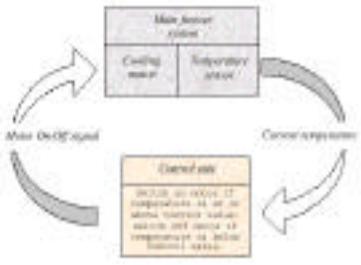
- A systems exists within an environment.
- A system is separated from its environment by some sort of a boundary
- Systems have inputs and outputs. They receive inputs from their environment, and send outputs into their environment.
- Systems have interfaces. An interface allows communication between two systems.
- A system may have sub-systems. A sub-system is also a system, and may have further sub-systems of its own.

System Parts



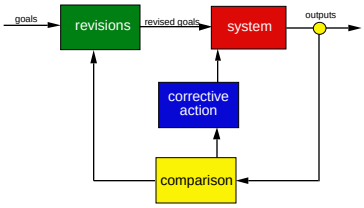
Feedback

Aims to maintain the system´s equilibrium by opposing deviations from some norm.

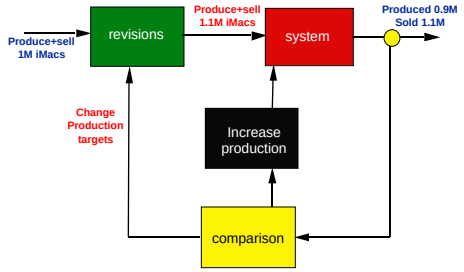


Organizational Feedback and Control

Organizational systems need feedback mechanisms too, to ensure that their intended goals are met.



Organizational Feedback Example



Information systems play an important role in the provision of feedback

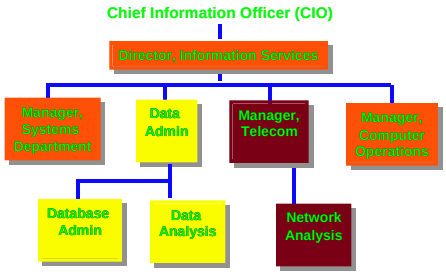
Feedforward

- Relies on sampling system´s inputs rather than its outputs.
- Positive feedback: works by reinforcing deviations instead of opposing them and therefore tends to increase movements away from equilibrium.
- For example, consider seasonal markets (such as the Christmas toy business): manufacturing is adjusted to suit the level of orders (input) rather then sales (output.)

Information Needs for Organizational Integration, Feedback and Control

Managt. Level	Information Use	Information Requirements
Top Management	Goal setting, long-term plan. strategy return to invest.	External info: new markets, competitors, govt., Internal info: financial reports, long-term trends, what-if info,...
Middle Management	objectives def. medium-range planning tactics	Internal info, problem reports, short-term trends,
Lower Management	obj. attainment short-term plan. supervision	Internal info, recent historical data, details on operations, exceptions report

The Structure of Information Services Departments within an Organization



Information Services Components

- **Operations Centre:** Runs computer and communications units; consists of systems programmers, engineers, operators, data entry personnel, couriers; responsible for systems' operation and support
- **Systems Department:** Interfaces with the rest of the organization and determines what systems are to be built; consists of systems analysts, application programmers, documentation personnel, database designers; responsible for new application development
- **Data Administration:** Responsible for organizational databases and database design
- **Telecommunications Centre:** Serves the telecommunication and (micro)computer needs of the organization. Buys, evaluates and installs microcomputers,software and in-house network services. May also handle document storage and retrieval; responsible for infrastructure

The Structure of IS Departments: Centralized, Decentralized or Outsourced?

- **Centralized departments** mean that there is only one hardware facility, one systems management group, one information systems specialist group

centralization, in general, doesn't make much sense today

- **Decentralized departments** means that each organizational unit looks after its own information system needs
- For decentralized information system department, organizations need to ensure that common standards are adhered to with respect to networking, hardware and software

General trend towards decentralization

- More and more, organizations are **outsourcing** their information services, i.e., they buy such services from an outside company

Business Processes

An organization is more than a collection of subsystems connected through input/output links. An organization's function is determined by **business processes** which are defined by management, consistently with organizational goals and objectives, and are implemented by all employees.

Example: Ordering equipment within a large engineering company:

Ordering Process 1: The employee who needs the equipment selects a vendor, gets approval from her manager and has her department generate a purchase order

Ordering Process 2: The employee gets approval from her manager, has her department generate a memo to purchasing department, which issues a purchase order to the vendor of their choice.

What are the advantages and disadvantages of each process?

Business Process Reengineering

- In the '90s, organizations discovered that thanks to technology, they could restructure their operations around new business processes to improve efficiency.
- The new organizational structure focuses on what the organization does, not departments and divisions.
- For example, consider a bank and its handling of loan applications. Traditionally, this handling involved passing on an ever-growing file from department to department (branch manager to central office to information services department to legal office etc.) Processing an application would take months and often things "fell through the cracks".
- Instead, the new approach is to assign to a team of people (e.g., one each from information services and legal departments) a stack of applications for which they are responsible from start to finish.

Coarse-Grain Models of Organizations

- **Rational System** -- an organization is a collectivity oriented to the pursuit of specific goals and exhibiting a relatively highly formalized social structure

  existing global goals and structure
- **Natural System** -- an organization is a collectivity whose participants are little affected by the formal structure or official goals but who share a common interest in the survival of the system and who engage in collective activities, informally structured to secure this end

  existing global interests
- **Open System** -- an organization is a coalition of shifting interest groups which develop goals by negotiation; the structure of the coalitions, their activities and the outcomes of these activities are strongly affected by environmental factors

  everything is local and dynamic

[Scott87]

Problems

1. The models of organizations shown on slides 3-5 are for production organizations. Give corresponding diagrams for service organizations (e.g., banks). Explain your diagrams with comments, as you would for a program.
2. Describe the organization chart for an organization you are familiar with, or one you can read about from publicly available documentation.
3. Describe a bank as a system of inputs and outputs (see slide 12). Give examples of objectives and feedback mechanisms that might be used to ensure that objectives are met.
4. Describe the information services department of the university.
5. Describe a business process for an organization you are familiar with. Give details about information sources you used.

Additional Readings

[Galbraith73] J.R. Galbraith, *Designing Complex Organizations*, Addison Wesley, 1973.

[Hammer90] M. Hammer, "Reengineering Work: Don't Automate, Obliterate", *Harvard Business Review*, July-August 1990, pp.104-112.

[Mintzberg79] H. MIntzberg, *The Structuring of Organizations* , Prentice-Hall.

[Pfeffer78] Pfeffer, J and Salancik, G., *The External Control of Organizations: A Resource Dependency Perspective*, Harper and Row, 1978.

[Scott87] Scott, W. *Organizations: Rational, Natural or Open Systems*, Prentice Hall, 2nd edition, 1987.