Today:
Different Types of Information Systems:
Traditional Classification

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Learning goals – this lesson

- What is an information system?
- Overview of traditional types of information systems
  - Why is this useful to you as a student?
    - Easier to learn about new systems if you know the context they emerged from
  - Why is this useful to you as a practitioner?
    - Many companies still use old legacy systems from the 90’s, 80’s, ...
    - Knowing where package solutions are likely to be available
      - i.e., possible to buy rather than build

What is an Information System?
- Information = data + metadata,
  - i.e. data has been processed so as to be meaningful to the recipient
- An information system (IS) is...
  - "...an arrangement of people, data, processes, communications, and information technology that interact to support and improve the day-to-day operations in a business, as well as support the problem solving and decision-making needs of managers and users"
- A computerized information system (CIS)
  - is the part of of an IS automated by the use of ICT
- An application
  - Is an end-user program system being part of a CIS
- An application package
  - Is a COTS product
- Often, “information system” is seen as different from
  - Embedded system
  - Command & control system

Organizational uses of information
- Planning
- Recording
- Controlling
- Measuring
- Decision-making
  - Strategic
  - Tactical
  - Operational
- Can you give me some examples of (types of) information systems?
Example: Electricity network company

Assume that you, as an IS-consultant is hired by an electricity company that is dissatisfied with their current information processing. What can possible problems and solutions be?

Further challenges: mergers

Types of information systems (1)

Covered by the Hawryszkiewycz book, ch. 1-3
- What are the kinds of systems? (pp 7-13)
- Corporate Computer Systems (pp 14-17)
- Networking (pp 17-24)
- Ch2: Workgroup systems
- Ch3: Evolving business systems
- Somewhat unsystematic?
  - E.g., architectural aspects mingled with function / organizational need
- This lecture (+ next week)
  - Covers the same types of systems
  - Loosely based on the Hawryskiewycz book

Traditional types of computerized IS

- Transaction processing systems (TPS)
  - Daily routine transactions
- Knowledge work systems (KWS)
  - Highly skilled creation and synthesis of knowledge
- Office automation systems (OAS)
  - Incl. Office tools, email, conferencing etc.
- Management information systems (MIS)
  - Summary reports from TPS, for middle-level managers
- Decision-support systems (DSS)
  - Making decisions from unstructured info
- Executive support systems (ESS, or EIS)
  - Reports from TPS and external sources, for top-level managers
Transaction processing systems (TPS)

- Examples: flight reservation, bank accounts, stock control...
- Automate the handling of information about business activities, often seen as discrete events
- Used at the operational level for the hour-to-hour running of the business
- Traditionally, an organization would have many TPS's, e.g. one for each department
- Typical architectures:
  - Centralized
  - Distributed
    - Two-tier vs. three-tier
    - Homogeneous vs. heterogeneous

Centralized TPS

Two-tiered distributed TPS

Three-tiered distributed TPS
OAS and KWS

- Office Automation Systems
  - Improving the productivity of employees who need to process data and information
  - Supporting typical office work, e.g., letter writing, messages, workflows for administrative routines

- Knowledge Work Systems
  - Supporting work which in itself creates and synthesizes information
  - Used by highly skilled personnel
  - Example: CAD, CASE, document management systems

Management Information Systems (MIS)

- Summarise data from TPS into reports
- Mostly for middle-level managers
- Organization-internal data
- Types of reports
  - Summary
  - Scheduled
  - Exception
  - On demand
  - Ad hoc

MIS architecture

Decision-support systems (DSS)

- Support for making decisions (unstructured and semi-structured)
- Project future states of the world based on past data (from databases of TPS and MIS)
- Using a model base to provide this analytical capability

- NB: “Decision-support system” is not synonymous with Expert system
### DSS architecture

![DSS architecture diagram](image)

- User
- Dialog management
- Data management
- Databases (org, internal and external)

### Executive Support Systems (ESS)

- Also called Executive Information Systems (EIS)
- Like MIS: aggregating lower level data from DB's into summaries / reports
- Difference from MIS:
  - Higher level of abstraction
  - Higher tendency to combine internal and external data
  - Better UI, more focus on graphics

### Ways to classify computerized IS

- A CIS can be classified along several dimensions:
  - Organizational level of use
  - Function (what does it do for the users?)
  - System scope (personal, group, department, organization, inter-organizational, global)
  - Architecture (e.g., centralized vs. distributed)
  - Other user characteristics (e.g., age, gender, handicaps, technical skills)
  - Implementation approach (e.g., custom-built program vs. package solution)
  - ...?

### Classification by org. level

![Classification by org. level diagram](image)

- Strategic level
- Top managers
- Management level
- Middle managers
- Knowledge level
- Knowledge workers
- Operational level
- Operators

How do the mentioned types of systems fit in here??
Classification by function (1)

- Separating between two major categories of IS:
  - Operational IS:
    - help the day-to-day operation of the organization
  - Informational IS:
    - Analyzing data, making decisions
- Continuum rather than binary distinction?

Where do the mentioned system types fit in here??

Classification by function (2)

- Mentzas (1994), a 3D framework
  - Collaboration process support
  - Decision process support
  - Information process support

How do the mentioned types of systems fit in here??
And any other systems to complete the picture??

Modern trends:

- More integration:
  - Trad. TPS’s: one for each functional department
  - Now: one system covering all, e.g., ERP, corporate portals
- More collaboration support:
  - Trad. systems: shared DBs or documents
  - Now: more sophisticated support: groupware.
- More dynamic analysis of data
  - Trad. MIS & ESS: rather static, two-dimensional reports
  - Now: more flexible data analysis, e.g., data warehouses
- Extending the automation boundary
  - Trad systems: within the organization
  - Now: internet, e-commerce, integration with customers (B2C) and partners (B2B)

Next week

- Monday 17-19, aud. S5
  - More detailed info about the exercises
- Lectures Tuesday and Thursday:
  - Will look more closely at these more modern types of systems:
    - Workgroup systems, Hawr chap. 2
    - Evolving business systems, Hawr ch.
  - …for which there are usually available package solutions in the market