Advanced Management Information System
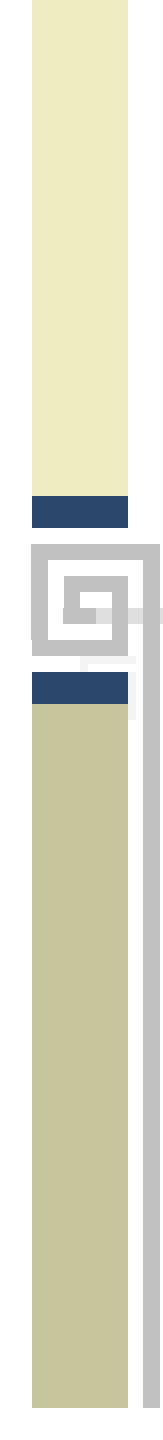
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Introduction to business information systems

Chapter 1
Basic concepts – understanding information

Learning objectives

- After this lecture, you should be able to:
  - **Distinguish between data**, **information and knowledge**;
  - Describe and **evaluate information quality** in terms of its **characteristics**;
  - **Classify decisions** by type and organizational level;
  - Identify the **information needed to support decisions** made at different organizational levels;
  - **Identify some of the tools and techniques** used to help make decisions.

Management issues

- From a managerial perspective, this chapter addresses the following areas:
  - The **importance of managing information** and knowledge as a **key organizational asset**.
  - The **transformation process from data to information of high quality**.
  - The **process and constraints of decision mak**ing.
  - The **different kinds of decisions that managers make** and how these affect the organization.

What is data?

- **Data** are **raw facts** or observations that are considered to **have little or no value until** they have been **processed and transformed into information**.

- A **collection of non-random facts** recorded by observation or research.

- **Example** definitions:

  (a) *a series of non-random symbols, numbers, values or words;*

  (b) *a series of facts obtained by observation or research and recorded;*

  (c) *a collection of non-random facts;*

  (d) *the record of an event or fact.*

What is information?

- Information: **Data that have been processed** so that they are meaningful.

- Example definitions:

  (a)   *data that have been processed so that they are meaningful;*

  (b)   *data that have been processed for a purpose;*

  (c)   *data that have been interpreted and understood by the recipient.*

Transformation processing

- Transformation process = data process
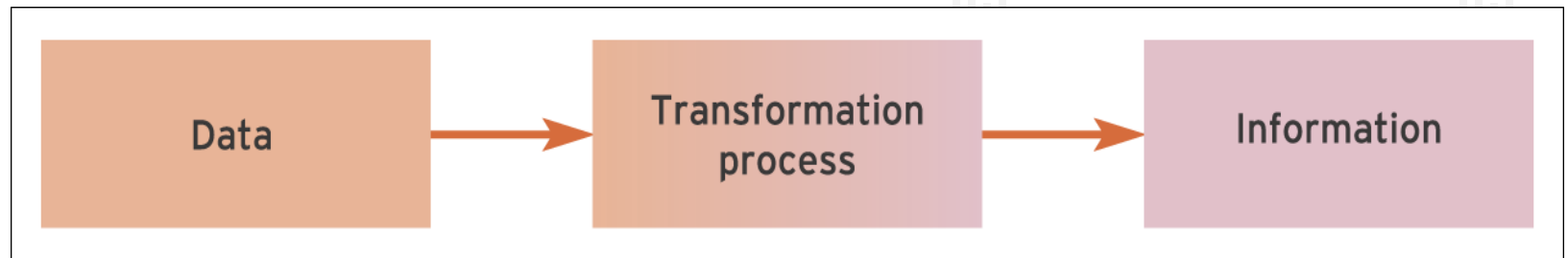- Converting data into information

Figure 1.2 Transforming data into information using a data process

Information – summary

- Information:
  - involves **transforming data using a defined process**;
  - involves **placing data in some form of meaningful context**;
  - is produced in response to an information need and therefore **serves a specific purpose**;
  - helps to **reduce uncertainty**, thereby **improving decision behavior**.

Activity

- **What types of information processing are involved** when a national retailer summarises the national **sales formation nationally**?

Types of information processing

- **Classification**: This involves **placing data into categories**,

  for example, categorizing an expense as either a fixed or a variable cost.

- **Rearranging/sorting**: This **involves organizing data so that items are grouped together or placed into a particular order**.

  Employee data, for example, might be sorted **according to the last name** or payroll number.

Types of information processing

- **Aggregating**: This **involves summarizing data**, for example, by **calculating averages**, totals or subtotals.

- **Performing calculations**: An example might be **calculating an employee's gross pay** by multiplying the number of hours worked by the hourly rate of pay.

- **Selection**: This **involves choosing or discarding items of data on the basis of a set of selection criteria**.

  A sales organization, for example, might create a list of potential customers by selecting those with incomes above a certain level.

Activity 1.1 – Data v. information

- From the point of view of a student at university, which of the following might be examples of information? Which might be examples of data?

  (a) the date;

  (b) a bank statement;

  (c) the number 1355.76;

  (d) a National Insurance number;

  (e) a balance sheet;

  (f) a bus timetable;

  (g) a car registration plate.

Information value

- In some cases, the **value of information can be measured directly**. However, in **many cases it is impossible** to measure it directly .

    Tangible value:

    A value can be **measured directly**, usually in term of **financial value** .

- *E.g., increase revenue*

    Value of information – Cost of gathering information

    Intangible value:

    *A value that is **difficult or impossible** to quantify*

    - *E.g., increase customer satisfaction*

    Improvements in decision behaviour – Cost of gathering information.

Activity 1.2 – Tangible and intangible information

- When **information is used effectively**, it can bring about **many of the improvements** listed below. State and explain why each of the items listed illustrates a tangible or intangible value of information.

  (a) **improved inventory control**;

  (b) enhanced **customer service**;

  (c) increased **production**;

  (d) **reduced administration costs**;

  (e) **greater customer loyalty**;

  (f) enhanced **public image**.

What is the importance of informal information?

- ## Sources of information :

Information can be gathered **through both formal and informal communication**

Sources of Information

Formal communications

Informal communications

Presenting information in a structured and consistent manner **like Company reports**

The **structure is inflexible**.
It **overlook the information which can reduce the quality** of the decision making.

Sources of Information

Formal communications

Informal communications

Less well-structured information that is transmitted by informal means such as **words of mouth** (casual conversation)

May result in incorrect or inaccurate information. Less accountability is expected from informal communications.

Quality of Information

- Quality of information can be described via different characteristics

- **Attributes of information quality**
  - ◦ A group of **characteristics by which the quality of information can be assessed**, normally grouped into **categories of time, content and form**

Attributes of Information Quality

- 3 dimensions:
  - Time
    - **Related to the time** of collection and review.

  - Content
    - Related to the **scope and contents** of the information

  - Form
    - Related to the **presentation of information** to recipient

Attributes of Information Quality

- Time dimension
  - **Timeliness** = information should be **available** when **needed**
    - Not too early nor too late
  - **Currency** = information should reflect **current circumstances** when provided
    - Up-to-date
  - **Frequency**= Information should be **available as often as needed**
    - Weekly/monthly reports

  - **Time period** = information should **cover the correct time period**

Attributes of Information Quality

- **Content dimension**
  - **Accuracy** = accurate information
  - **Relevance** = information should be **relevant to a particular situation** and meet the information needs of the recipient.
  - **Completeness** = all information that meet the **information needs of the recipient** should be provided
    - Information should be complete
  - **Conciseness** = only information **relevant to the information needs** of the recipient should be supplied
    - Provide information in the most compact form possible
  - **Scope** = the scope of the information should be **appropriate to the information needs** of the recipient

Attributes of Information Quality

- **Form dimension**
  - **Clarity** = present information in a form that is **appropriate to the recipient**
    - Clear form and content to be more understandable
  - **Detail** = **correct level of details** that meet the information needs of the recipient
    - Summary or highly detailed information
  - **Order** = provide information in a **correct order**
    - Report should begin with a brief summary followed by detailed information
  - **Presentation** = present information in a **form that is appropriate** to the recipient
    - Use graphs to present numerical information
  - **Media** = present information using the **correct medium**
    - Printed, video projector

Information quality dimensions

Time	Content	Form	Additional characteristics
Timeliness	Accuracy	Clarity	Confidence in source
Currency	Relevance	Detail	Reliability
Frequency	Completeness	Order	Formatted correctly
Time period	Conciseness	Presentation	Appropriateness
	Scope	Media	Received by correct person
			Sent by correct channels

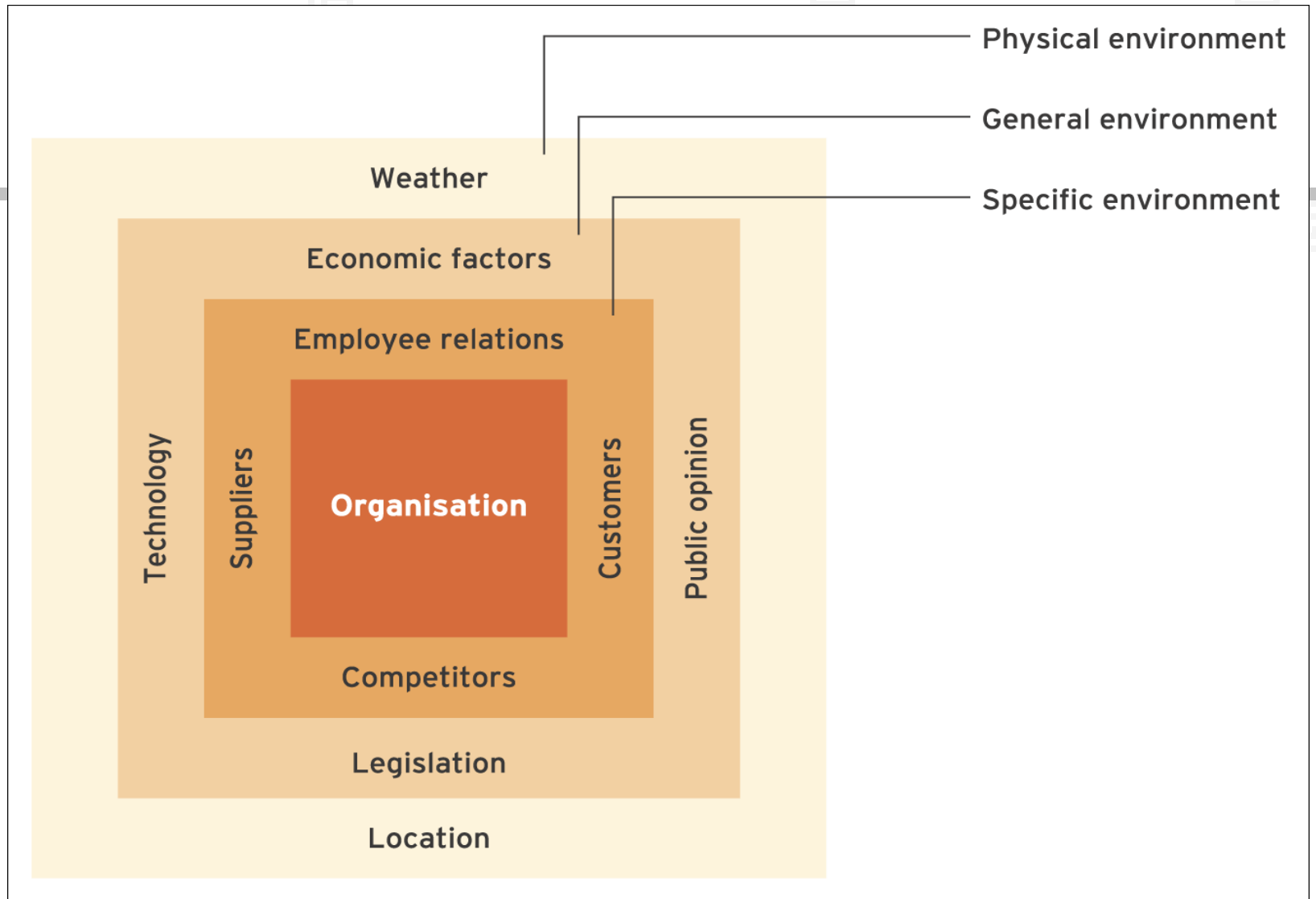Table 1.1 Summary of attributes of information quality

Figure 1.3 **The business environment of an organisation and the main factors that influence it**

What is the relation between e-business and IT

- The **European Commission** describes **e-business** like this:
  - *The term 'e-business' covers both e-commerce (buying and selling online) and the restructuring of business processes to make the best use of digital technologies*.
- In general, e-business is concerned with making **day-to-day business activities** more efficient by improving information exchanges within the organization and between the organisation and its partners.
- e-Business : The use of information and communication technologies to support day-to-day business activities

How does information support managers?

- Henri Fayol (1841–1925) devised a classic definition of management that is still widely used in both industry and academia.

  'To manage is to forecast and plan, to organise, to command, to coordinate and to control.'

Decision Making

- **Decision behaviour**: Describes **how managers make decisions and the factors** that influence them.

- Different decision types
  - **Structured decisions**: Situations where the **rules and constraints governing** the decision are **known**.

    ex: how should we process a sale order?

  - **semi-structured decisions** :between structured and unstructured decision

    ex: which **foreign markets** should we **target** ?

  - **Unstructured decisions**: **Complex situations**, where the **rules governing the decision** are **complicated or unknown**.

    ex: what should our distribution channels be?

Figure 1.4 **Levels of managerial decision making**

Information characteristics for decisions by management levels

Management level	Information					
	Time period	Frequency	Source	Certainty	Scope	Detail
Strategic	Wide	Infrequent	External	Less certain	Wide	Summarised
Tactical	↔	↔	↔	↔	↔	↔
Operational	Narrow	Frequent	Internal	More certain	Narrow	Detailed

Table 1.3 Information characteristics for decisions by management levels

A model of decision making

Stage	Activities
Intelligence	■ Awareness that a problem exists ■ Awareness that a decision must be made
Design	■ Identify all possible solutions ■ Examine possible solutions ■ Examine implications of all possible solutions
Choice	■ Select the best solution
Implementation	■ Implement the solution
Evaluation	■ Evaluate effectiveness or success of decision

Table 1.4 A model of decision making

The Decision Making Process

- **Intelligence**
  - Problem identification
  - Information gathering
- **Design**
  - Identify and evaluate all the possible solutions
  - Examine the implications of the possible solution
- **Choice**
  - Select the best solution
- **Implementation**
  - Implement the solution and achieve the resolution to the problem
- **Evaluation**
  - How successful the solution has been
- If further action is required, the decision maker returns to the first stage and examine the problem again

Knowledge management

- Bergeron (2003), defines knowledge management like this:

  - *Knowledge Management (KM) is* **a deliberate, systematic business optimization strategy that selects, distils, stores, organizes, packages, and communicates information essential**

  to the business of a company *in a manner that* **improves employee performance** *and corporate.*

Knowledge management (Continued)

- Many organizations have adapted to the **knowledge economy by adopting new structures** and by creating new roles for managers.

- The term **knowledge worker** describes a person whose role is based around **creating, using, sharing and applying knowledge**.

- The work of a **knowledge engineer** focuses on **eliciting knowledge** from experts so that it can be **recorded and shared with others** within the organization.

Knowledge management (Continued)

- **Knowledge** can be **thought of as the combined result of a person's experiences** and the information they possess.
- In general, **knowledge can be described as explicit or tacit**.
  - **Explicit knowledge** is **easily captured** and **stored within documents and other media**. This type of knowledge tends to be highly detailed, **formal and systematic**. It is often stored in the form of manuals, documents, procedures and database files.
  - **Tacit knowledge** is characterized by factors such as **perceptions, beliefs, values**, **instinct and experience**. Since a great deal of tacit knowledge may be held unconsciously, it is **difficult to** elicit, **describe or record**.

Knowledge management (Continued)

- **Knowledge management** is involved with **collecting (eliciting) knowledge and converting (codifying) it into a form** that allows it to be **shared across the organization**. A key part of this process **involves gathering tacit knowledge and converting it into explicit knowledge**.

Competitive intelligence (CI)

- CI involves **collecting data from a number of disparate sources and converting it into useful information** about an organization's competitors.

- The **information** gathered is used to **support decision making within the organization**, allowing it to **respond more effectively to competition**.

اهداف درس

هدف از این درس ارائه یک دید کلی نسبت به سیستم اطلاعات مدیریت است که مباحث زیر را در بر میگیرد:

- **مدلهای عمومی شامل:** اهداف سیستم، ویژگیها و عملکرد

- **جنبه های عملی شامل:** پیاده سازی سیستم، سیستم پشتیبان تصمیم، هوش مصنوعی

- **مفاهیم تئوریک شامل:** اجزاء و عملکرد سیستم، ارتباطات، پایگاه داده، TPS، عملکرد سیستمهای اطلاعاتی.

سرفصل مطالب

- کلیاتی درخصوص سیستم
- تجزیه و تحلیل
- طراحی سیستم
- System Life Cycle
- سیستمهای اطلاعاتی
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- ارتباطات و عملکرد آنها
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- تبادلات الکترونیکی
- طبقه بندی، مشخصات، ویژگیها و موفقیت کاربران

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Evaluation Method

حضور مداوم در کلاس بدون یک جلسه غیبت ۱+

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سمینار گروهی پروژه ۲

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پایان ترم ۸

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Best Wishes