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High Level Course Aim



The aim of this module is to provide students with knowledge of the purpose, design and context of enterprise architectures and systems within an organisation.

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Delivery

Classes per week

→ Lectures – 2 x 1hr sessions (Tue/Thur)

→ Labs - 1 x 2hr sessions (2 groups - Tue/Thur)

Brightspace (Module Id: CMPU4025)

→ Enterprise Sys Inf. and Arch. CMPU4025: 2022-23

→ “Ciaran Cawley - TU856/TU858 Stage 4 Semester 2”

→ Lecture Slides

→ Lab Sheets


→ Information / Announcements / Communication

→ Extra Material


→ Assignments

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Assessment - TBC



Exam – 60%



Continuous Assessment – 40%

Lab Test – 15%

Written Assignment / Presentation
(Essay / Report) – 25%

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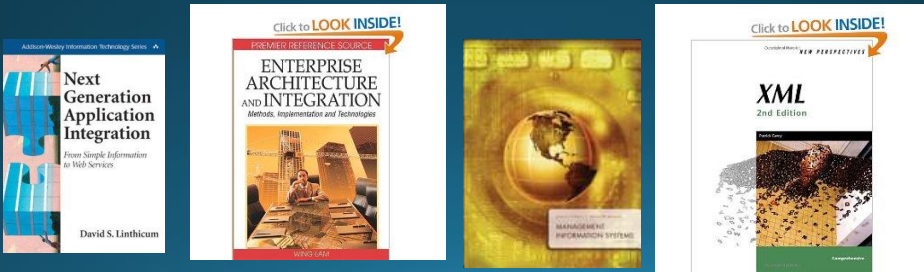
Books

Linthicum, David S., *Next Generation Application Integration: From Simple Information to Web Services*. Addison-Wesley Information Technology Series

Lam, Wand, *Enterprise Architecture and Integration: Methods, Implementation and Technologies*, Information Science Reference

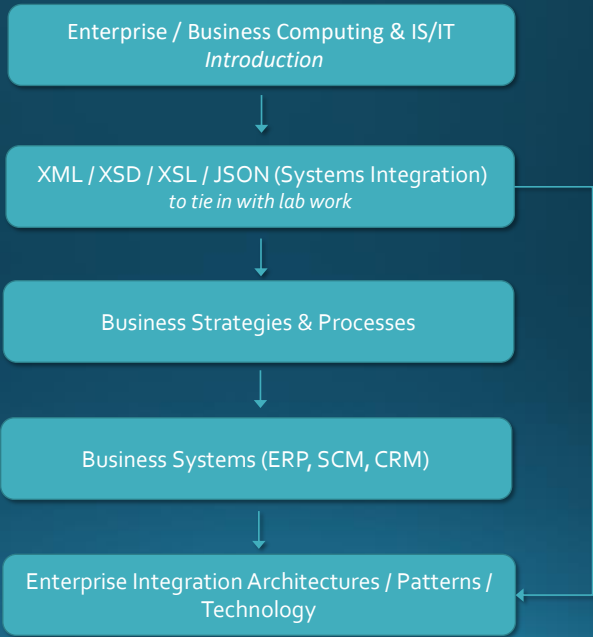
O'Brien, *Management Information Systems*

Carey, *New Perspectives on XML*



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Content



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Introduction

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Business / Enterprise Computing

1. Business / Enterprise
2. Information Systems
3. Information Technology

Enterprises use Information Technology & Systems to *gain advantage*



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Business / Enterprise

What is an Enterprise?

Definition :

1. An undertaking, especially one of some scope, complication, and risk.
2. A business organization.
3. Industrious, systematic activity, especially when directed toward profit: Private enterprise is basic to capitalism.
4. Willingness to undertake new ventures; initiative

- ✓ Walmart 2019 – total revenue of \$524 billion
- ✓ Employs more than 2.2 million associates around the world.
- ✓ Early adopters of *Information Technology*

 <https://www.youtube.com/watch?v=ANdUwsKk6I>

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Business / Enterprise

Our definition:

An enterprise is an organization that uses computers...

- ☐ That could mean big, small or complex organizations: small businesses, SME, multi-national corporations.
- ☐ *Note: Enterprise Systems in the computing industry generally refers to large corporations.*

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Information System


What is a *System*

- A set of interrelated components
- With a clearly defined boundary
- Working together
- To achieve a common set of objectives




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Information Systems (IS)



What is an *Information System*



An organized combination of...


People

Hardware and software

Communication networks

Data resources

Policies and procedures



This system...

Stores, retrieves, transforms, and disseminates information in an organization

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Information Systems

All the components and resources necessary to deliver information and functions to the organization

Could be paper based...



Information Technologies

Hardware, software, networking, data management

Information Technologies

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Impact of IT

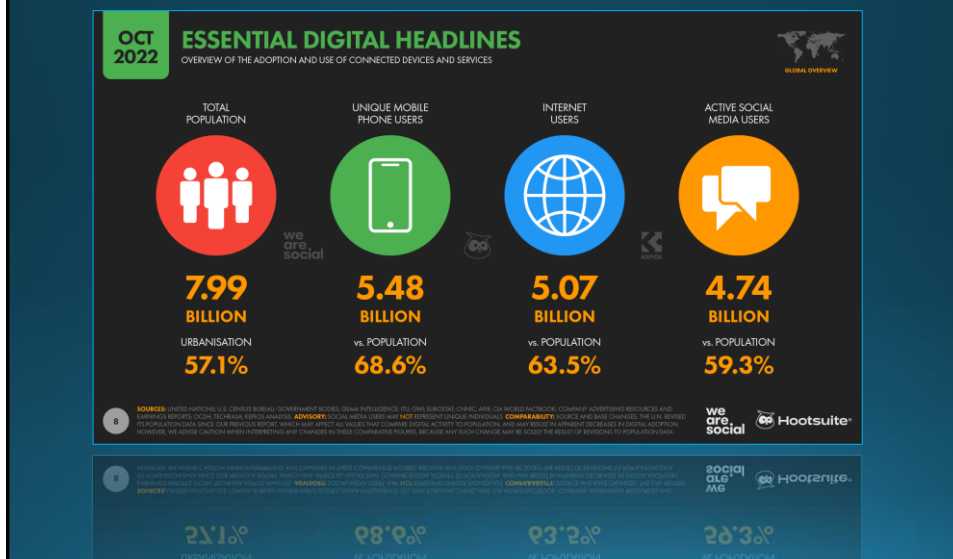
- Huge increase in spending on ICT (information & communication technology) by business
- Evident in everyday office life (smartphones, tablets, remote working, social media integration)
- Facebook - over 2.7 billion monthly active users as of the second quarter of 2020
- Hyperautomation, Multiexperience, Democratisation, Human Augmentation – *set to shape the next 5 years* -
<https://www.youtube.com/watch?v=6HzdOkPPPRU>



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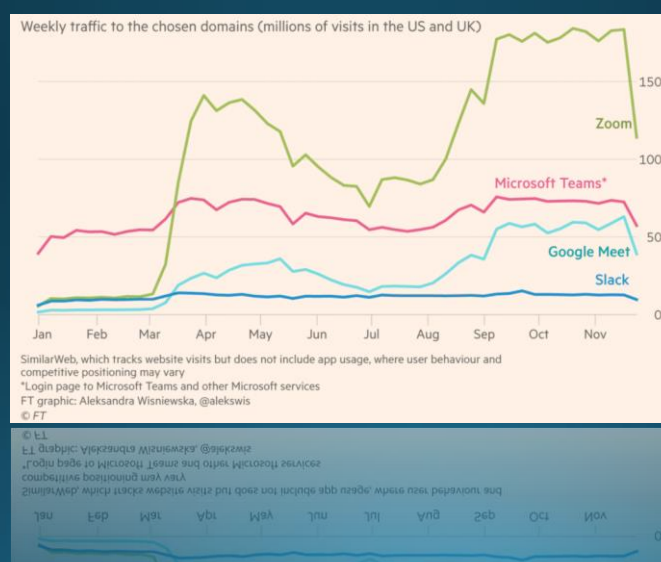
Impact of the Internet

source: <https://datareportal.com/global-digital-overview>



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Impact of the Internet



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Foundation Concepts

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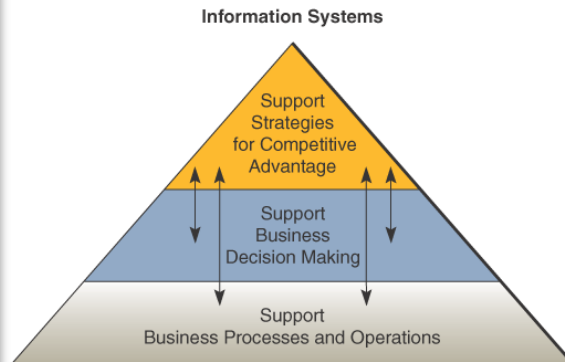
Foundation Concepts

Why study information systems and information technology?

- Vital component of successful businesses
- Helps businesses expand and compete
- Improves efficiency and effectiveness of business processes
- Facilitates managerial decision making and workgroup collaboration

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Fundamental Roles of IS in Business



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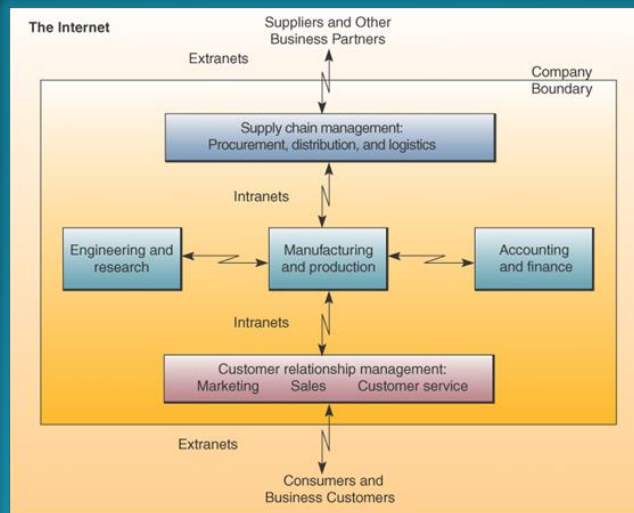
What is E-Business?



- Using Internet technologies to empower...
 - Business processes
 - Electronic commerce
 - Collaboration within a company
 - Collaboration with customers, suppliers, and other business stakeholders
- In essence, an online exchange of value

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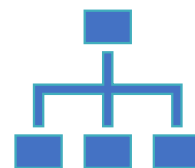
How E-Business is Being Used



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E-Business Use

- Reengineering
 - Internal business processes
- Enterprise collaboration systems
 - Support communications, coordination and coordination among teams and work groups
- Electronic commerce
 - Buying, selling, marketing, and servicing of products and services over networks



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Types of Information Systems

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Types of Information Systems

Operations Support Systems

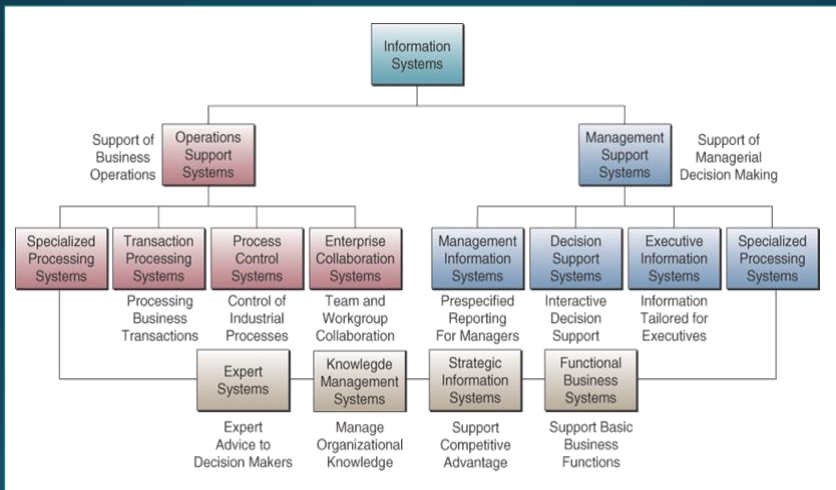
- Efficiently process business transactions
- Control industrial processes
- Support communication and collaboration
- Update corporate databases

Management Support Systems

- Provide information as reports and displays
- Give direct computer support to managers during decision-making

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Purposes of Information Systems



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Types of *Operations Support Systems*

Transaction Processing Systems

- Record and process business transactions
- Examples: sales processing, inventory systems, accounting systems

Process Control Systems

- Monitor and control physical processes
- Example: using sensors to monitor chemical processes in a petroleum refinery

Enterprise Collaboration Systems

- Enhance team and workgroup communication
- Examples: email, video meetings, chat software, integrated social media



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Types of Management Support Systems

Management Information Systems (MIS)

- Reports and displays
- Example: daily sales analysis reports

Decision Support Systems (DSS)

- Interactive and ad hoc support
- Example: a what-if analysis to determine where to spend advertising funds

Executive Information Systems (EIS)

- Critical information for executives and managers
- Example: easy access to actions of competitors



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Other Information Systems

Expert Systems

- Provide expert advice
- Example: credit application advisor

Knowledge Management Systems

- Support creation, organization, and dissemination of business knowledge throughout company
- Example: intranet access to best business practices

Strategic Information Systems

- Help get a strategic advantage over competitor
- Example: online shipment tracking

Functional Business Systems

- Focus on operational and managerial applications of basic business functions
- Examples: accounting, finance, or marketing



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Measuring IT Success



Efficiency

Minimize cost, time, and use of information resources



Effectiveness

Support business strategies
Enable business processes
Enhance organizational structure and culture
Increase customer and business value


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IT Challenges and Opportunities

The Business Enterprise

Strategies/Processes/Structure/Culture

Information Technology



Customer Value
Business Value

Business / IT Challenges

- Speed and flexibility requirements of product development, manufacturing, and delivery cycles.
- Reengineering and cross-functional integration of business processes using Internet technologies.
- Integration of e-business and e-commerce into the organization's strategies, processes, structure, and culture.

Business / IT Developments

- Use of the Internet, intranets, extranets, and the Web as the primary IT infrastructure.
- Diffusion of Web technology to internetwork employees, customers, and suppliers.
- Global networked computing, collaboration, and decision support systems.

Business / IT Goals

- Give customers what they want, when and how they want it, at the lowest cost.
- Coordination of manufacturing and business processes with suppliers and customers.
- Marketing channel partnerships with suppliers and distributors.

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Challenges and Ethics of IT



Application of IT

Customer relationship management
Human resources management
Business intelligence systems



Potential Harm

General Data Protection Regulation (GDPR)
- Infringements on privacy
- Inaccurate information
Collusion

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IS Function & Activity

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The IS Function

A major functional area of business

An important contributor to operational efficiency, employee productivity, morale, customer service and satisfaction

A major source of information and support for decision making

A vital ingredient in developing competitive products and services in the global marketplace

A key component of today's networked business

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System Concepts

System concepts help us understand...

- ✓ **Technology:** hardware, software, data management, telecommunications networks
- ✓ **Applications:** to support inter-connected information systems
- ✓ **Development:** developing ways to use information technology includes designing the basic components of information systems
- ✓ **Management:** emphasizes the quality, strategic business value, and security of an organization's information systems



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What is a System?

- *A system is...*

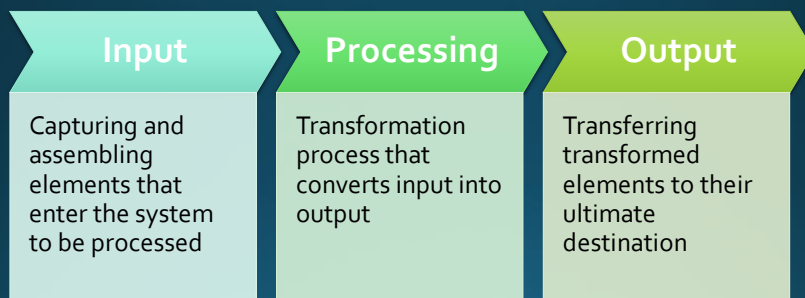
- A set of interrelated components
- With a clearly defined boundary
- Working together
- To achieve a common set of objectives

*By accepting inputs and producing outputs
In an organized transformation process*



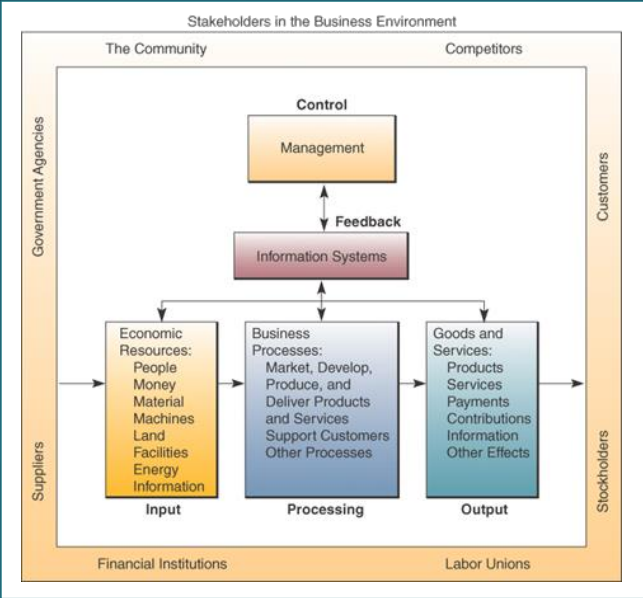
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Basic Functions of a System



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A Business as a System



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Other System Characteristics



If a system is one of the components of a larger system, it is a **subsystem**

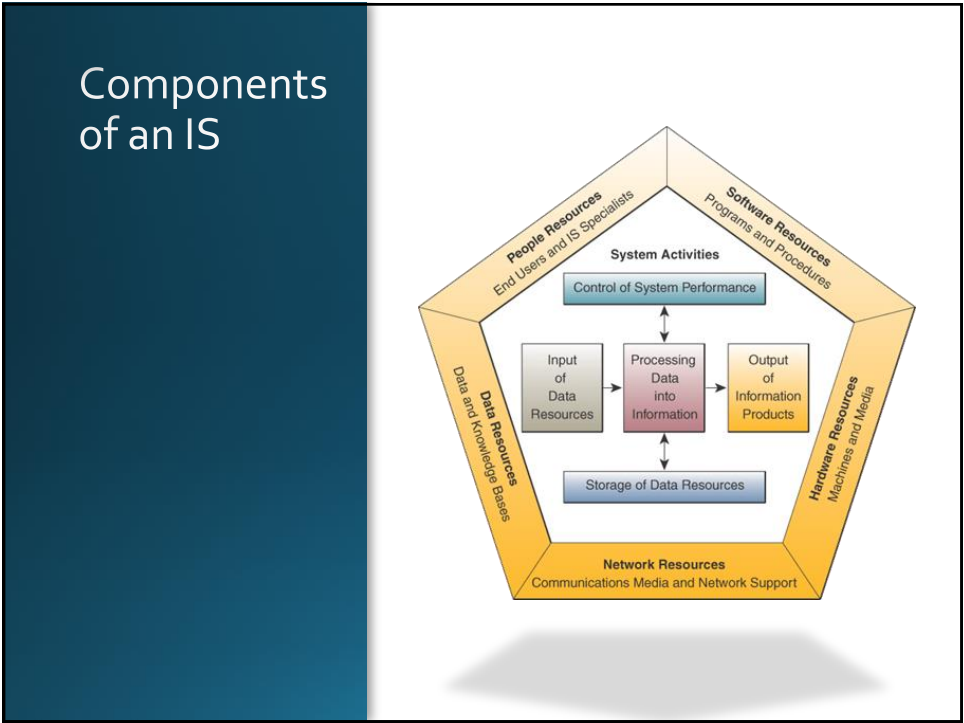
The larger system is an **environment**



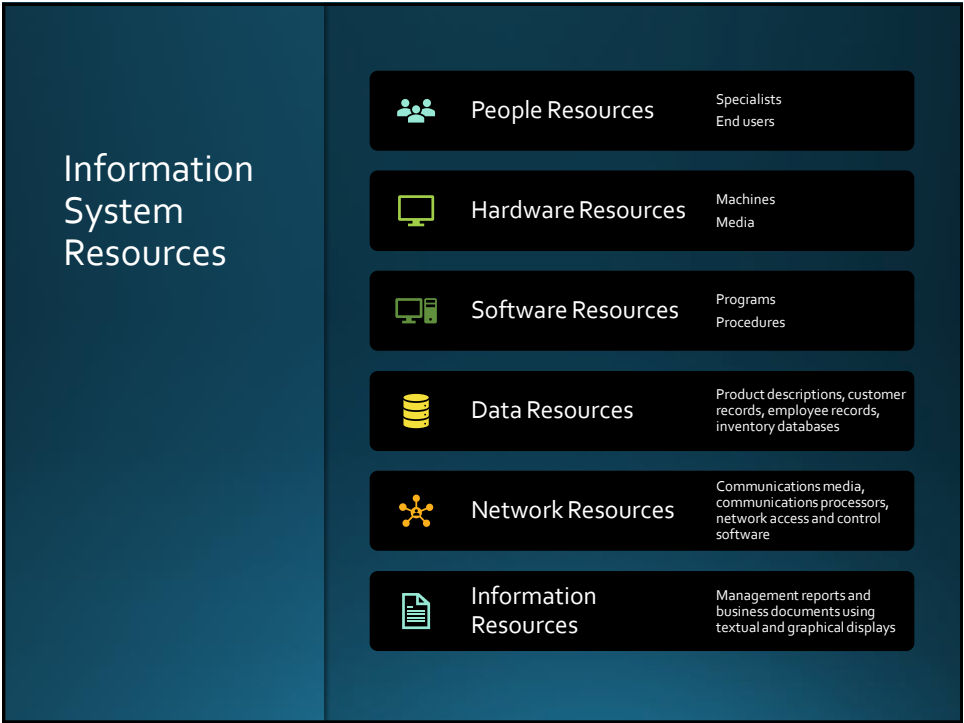
Several systems may share the same environment

Some may be connected via a shared boundary, or **interface**

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IS
Activities

**Input of data resources**


Data entry activities

**Processing of data into information**


Calculations, comparisons, sorting, and so on

**Output of information products**

Messages, reports, forms, graphic images


**Storage of data resources**


Data elements and databases


**Control of system performance**

Monitoring and evaluating feedback

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**Data** are raw facts about physical phenomena or business transactions

**Information** is data that has been converted into meaningful and useful context for end users

**Examples:**

Sales data is names, quantities, and euro amounts

Sales information is amount of sales by product type, sales territory, or salesperson

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Recognising Information Systems

Business professionals should be able to look at an information system and identify...

- ✓ The people, hardware, software, data, and network resources they use
- ✓ The type of information products they produce
- ✓ The way they perform input, processing, output, storage, and control activities

