FACOLTÀ DI INGEGNERIA
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STUDI DI PALERMO

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Ingegneria Gestionale

Sistemi ICT per il Business Networking

ICT Evolution in e-business

Docente: **Vito Morreale** (vito.morreale@eng.it)

Organizational System

- Set of **resources** and **rules** to perform **coordinated activities** with the aim of achieving corporate **goals** and implementing **strategies**
- **Resources** are:
  - people
  - money
  - materials, hardware, ...
  - information

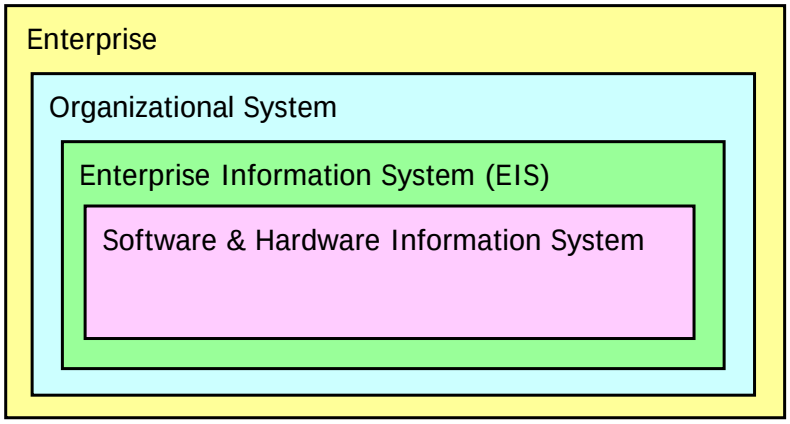
Information System

- Component (**subsystem**) of an organization that manages (acquires, processes, stores, produces) interesting and useful information (used to pursue strategic corporate goals)
  - **part of** the organizational system
  - performs/manages **information processes** (mainly involving information)
  - **each** organization has an information system, even not explicit or automatic
  - often **supports** other systems
  - usually divided into several **subsystems** (hierarchically or distributed), integrated or not

Information systems & technology

- Information systems **also** exist **without automation**
  - There are several organizations whose main goal is to handle information (e.g. register of birth and marriages, banks)
- **Software & Hardware Information System**: part of the information system that manages information by means of hardware, software, and information technology

Enterprise Information Systems: context



Enterprise Information Systems (EIS)

- **Technological** and **organizational** issues
- Implementation of EIS will normally involve proper development **methodologies** and **information technologies**
- **Purpose**: an EIS exists within an organisation, to fulfil operational needs and to support strategic objectives
- **Important**: the **scope** (i.e. the border of the enterprise) is clear
- EISs have direct **impact** on the organisation at all levels, such as operational, tactical and strategic level ➔ the development of EIS must take into consideration the **organisational objectives** and **long-term goals**

The evolution of EISs: assumptions

- **Processor speed** will continue to grow
- **Network connections** will also operate a gigahertz speed and be accessible without physical connections.
- Computing will be **ubiquitous** and **mobile**
- **Nano-technologies** will be embedded in our clothes, the walls of our homes and offices, furniture, and even in our bodies
- People will be fully **interfaced with computers**
  - **All of our senses**, e.g., taste, smell, hearing, seeing, feeling, etc. will be stimulated through interfaces with computers
- **Automated reasoning** will continue to grow
  - many **decision-making tasks** will be performed by computers rather than people
- **Change** will continue to occur at a rapid pace

Impact of changes on EISs

- People will increasingly occupy both a **physical world** and **several virtual worlds** (e.g. a virtual world in which we work and a virtual world in which we will play)
  - Some of these worlds will operate in a manner where the laws of physics appear to hold, and others will invent their own laws of physics, cultural norms, etc.
- Members of an enterprise will have **ubiquitous access to information**
- No longer will our **decision making** be limited by what we personally know. Instead, we will be able to reach out to acquire whatever **information** is **relevant** to the task
- Trouble: the spectre of **information overload**

Impact of changes on EISs

- With the ascendancy of artificial intelligence, several operational **decisions** will be made by (or in cooperation with) **intelligent agents**
  - These agents will be **distributed** across the enterprise and coordinating their decision making in real time
  - The **humans** that remain in the organisation will be able to **communicate** with these agents, ask questions and influence their decision-making
- Members of the enterprise will have their own **personal agent** that will explore, extract and perhaps discover information relevant to their role in the organisation
- People can **focus** their energies on the truly creative tasks that remain

EIS over Internet

- The usage of Internet for exchanging **e-mails** and messages — **1986**
  - This adoption **did not** imply a **cultural change**
- **Static Web sites** with limited effectiveness — **1993**
- **Search engines** (e.g. Lycos, Yahoo, etc.)
- **Portals**
- Use of the Internet to perform **on-line commercial transactions** (e.g. purchases, sales, electronic auctions, e-payments) between — **1996**
  - enterprises and consumers (B2C)
  - among enterprises and suppliers (B2B)

E-business

1999

- Internet technology has become a **foundation** for applications linked to the **core business** systems, modifying
  - the internal working methods and processes and
  - the internal culture and organisation
- The enterprises is **directly connected** with clients, suppliers, and business partners
- **Important**: the scope (i.e. the border of the business organization) is **quite** clear
- Emergence of **new interoperability techniques and standards** (e.g. XML, ebXML)

E-business

- The extension of the usage of Internet from the simple commerce to **all operation of their business**, ...
- ... inventing **new operative processes** as well
- There is the possibility of **more productivity and quality** in all activities of business (e.g. marketing, sales, CRM, logistics, education, knowledge management)
- Examples of **applications**:
  - systems for ecommerce, e-procurement, SCM, CRM, ERP, logistics, planning, KM, e-training
- Examples of **innovative working processes** are:
  - customer call centres, Intranets that link business partners, data warehouses that improve customer relationships

Networked Organizations

- **Additional challenges** involves organization, staff training, outsourcing non-core operations, changes in processes and systems, and paying attention to legal and audit considerations
- **Tight integration** among organizations
- **The new frontier**: combining organizational genetics with advanced IT solution in unique and inventive ways
- **The goal**: combining organizational genes creating new organisms that (at least some of the time) will find ways to adapt to the new digital business environment
- Organisations build faster and more effective **strategic partnerships and alliances**, reengineer and integrate their business processes, develop value added products and services, and share knowledge and experiences

Networked Organizations

- Within (virtual) networked organizations, players make associations for **exploiting the market opportunities**, combine their products and services, could jointly produce and offer new services and products
- A response to the need for **new kinds of organizational structures**
- A **Networked Organization** has been **defined** by Lipnack as one "where independent people and groups act as independent nodes, link across boundaries, to work together for a common purpose; it has multiple leaders, lots of voluntary links and interacting levels"
- These new forms can best be described as **dynamic customer-centred networks**

Networked Organizations

- The **borders of organisations** are **not** clear
- From an ICT perspective a virtual organisation is comparable to **a collection of information systems** in a heterogeneous setting
- Heterogeneity not only refers to **hardware** and **software** platforms but also to **conceptual** platforms
- To support the primary process of a virtual organisation, **exchange of data** and **processes** is required

Towards the future

- **More dynamic cooperation** of the **autonomous** players
- **More dynamic connection** of the resources in a system
- **Communities** where **autonomous** parties share business, knowledge, and infrastructures
- **More fluid, amorphous, and transitory structures** based on alliances, partnerships and collaboration
- **Dynamic aggregation** of services and organizations

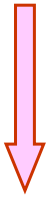
Towards the future

- **Required**: a further stage in ICT technology adoption which exploits the dynamic interaction (with cooperation and competition) of several players in order to produce systemic results in terms of innovation and economic development
  - Adoption and development of **scalable and adaptive technologies**
  - **Intelligent software components and services**, knowledge transfer, interactive training frameworks and integration of business processes and e-governance models
  - **Pervasive** software environments, with an **evolutionary** and **self-organising** behaviour

Topics

- Enterprise Information System (EIS)
  - Organizational systems vs. Information systems
  - Information systems and Information technology
  - Comments on EISs
  - The evolution of EISs: assumptions
  - The impact of changes in EISs
- Evolution of ICT in e-business
  - EISs over Internet
  - E-Business
  - Networked Organizations
  - The future: e.g. DBE

Is required more:
Dynamicity
Self-organizations
Adaptation
Connectivity
Pervasiveness



Benefits:
Cooperation
Autonomy
Loosely-coupled
Scalability
Automation of work

Conclusions

- **Information systems** as a key component for business networking
- **Ubiquitous** access to information
- **Decision making** in cooperation with (or with the assistance of) intelligent agents
- Some **core technologies** enabling and supporting e-business processes are **existing** ...
- ... but some of such processes could be **enhanced** with the support of **emerging technologies** and ...
- ... several other **processes and innovative contexts** will need new and emerging technologies or their definitive diffusion

References

- **Towards a network of digital business ecosystems fostering the local development** (discussion paper)
  - Paragraphs: 2. The Digital Systems Evolution and the Adopted Phases