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.

Delivery

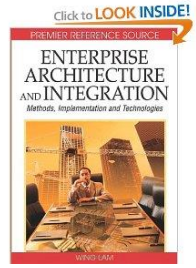
- Classes per week
  - Lectures – 2 x 1hr sessions
  - Lab 2 x 1hr sessions
- Webcourses
  - Class Slides
  - Information / Announcements
  - Extra Material
  - Assignments

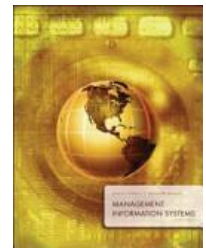
Assessment - TBC

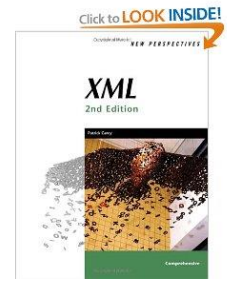
- Exam – 60%
- Continuous Assessment – 40%
  - Lab Test – 15% (week 6)
  - Written Assignment – 25% (week 12)

Books

- Linthicum, David S. (2003), ***Next Generation Application Integration: From Simple Information to Web Services***. Addison-Wesley Information Technology Series
- Lam, Wand (2007), ***Enterprise Architecture and Integration: Methods, Implementation and Technologies***, Information Science Reference
- O'Brien, ***Management Information Systems***
- Carey, ***New Perspectives on XML***







Content

- Enterprise / Business Computing - Introduction
- XML / XSD / XSL / JSON (Systems Integration)
- Business Strategies & Processes
- Business Systems
- Enterprise Integration Architectures / Patterns
- Service delivery models

Work Expectation

Module Code	Module Title	ECTS	Weekly Contact Hours			Total Hours			Assessment		
			Lecture	Labora-tory	Tut-orial	Contact	Self-Study	Total	Exam Weight	Exam Duration	Non-Exam Weight
CMPU4003	Advanced Databases	5	2	2		52	48	100	60%	2 hours	40%
CMPU4009	App Development and Commercialisation	5	2	2		52	48	100	50%	2 hours	50%
CMPU4007	Advanced Security 1	5	2	1		39	61	100	60%	2 hours	40%
CMPU4008	Advanced Security 2	5	2	1		39	61	100	50%	2 hours	50%
CMPU4010	Artificial Intelligence 1	5	2	2		52	48	100	70%	2 hours	30%
CMPU4011	Artificial Intelligence 2	5	2	2		52	48	100	70%	2 hours	30%
CMPU4012	Bioinformatics	5	2	1		39	61	100	70%	2 hours	30%
CMPU4013	Business Systems Intelligence	5	2	1		39	61	100	70%	2 hours	30%
CMPU4016	Compilers and Language Design	5	2	2		52	48	100	70%	2 hours	30%
CMPU4017	Computer Graphics	5	2	2		52	48	100	70%	2 hours	30%
CMPU4019	Designing and Building Semantic Web Applications	5	2	1		39	61	100	50%	2 hours	50%
CMPU4020	Digital Audio	5	2	2		52	48	100	70%	2 hours	30%
CMPU4021	Distributed Systems	5	2	2		52	48	100	70%	2 hours	30%
CMPU4023	Enterprise Application Dev.	5	2	2		52	48	100	70%	2 hours	30%
CMPU4025	Enterprise Systems and Architecture	5	2	2		52	48	100	60%	2 hours	40%
CMPU4028	Forensics	5	2	2		52	48	100	50%	2 hours	50%

Introduction / Fundamentals

Business / Enterprise Computing

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

- Enterprises use Information Technology to gain **advantage**

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

https://www.youtube.com/watch?v=ANdUwsKkB6I

http://www.thefreedictionary.com/enterprise

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.*

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

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

Information Technologies

- 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

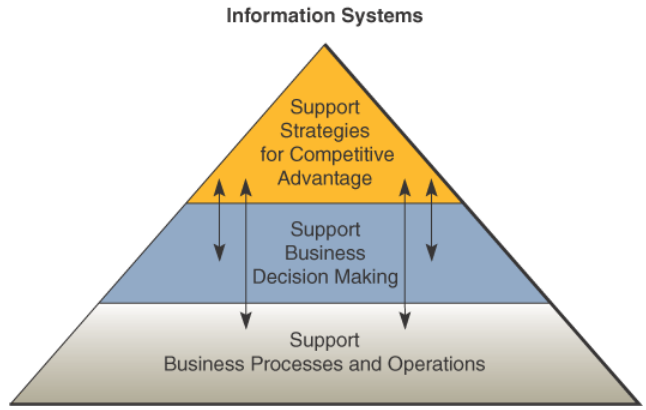
Impact of IT

- Huge increase in spending on ICT (information & communication technology) by business
- Evident in everyday office life (smartphones, tablets, IM, online conferencing, virtual offices)
- People using online devices and media for news, work and entertainment
- 1.37 billion people on average log onto Facebook daily and are considered daily active users (Facebook).

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

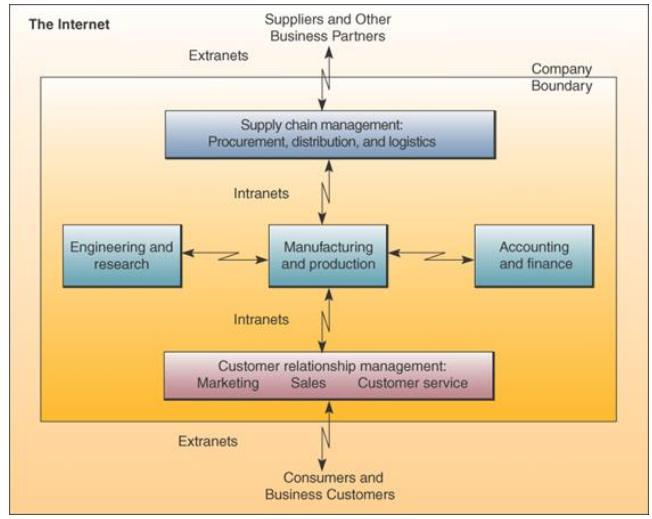
Fundamental Roles of IS in Business



What is Online/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

How E-Business is Being Used



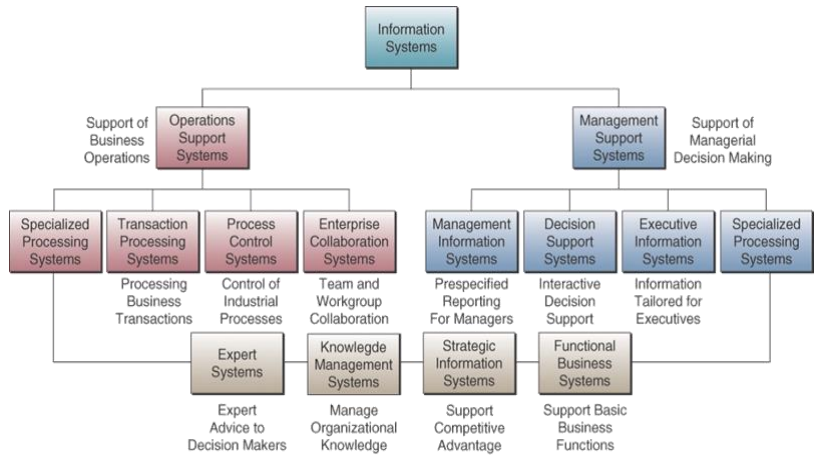
E-Business Use

- 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

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

Purposes of Information Systems



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 conferencing, IM, networking sites

Two Ways to Process Transactions

- Batch Processing
  - Accumulate transactions over time and process periodically
  - Example: a bank processes all cheques received in a batch at night
- Online Processing
  - Process transactions immediately
  - Example: a bank processes an ATM withdrawal immediately

Management Support Systems

- What do they do?
  - Provide information and support for effective decision making by managers
    - Management information systems
    - Decision support systems
    - Executive information systems

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

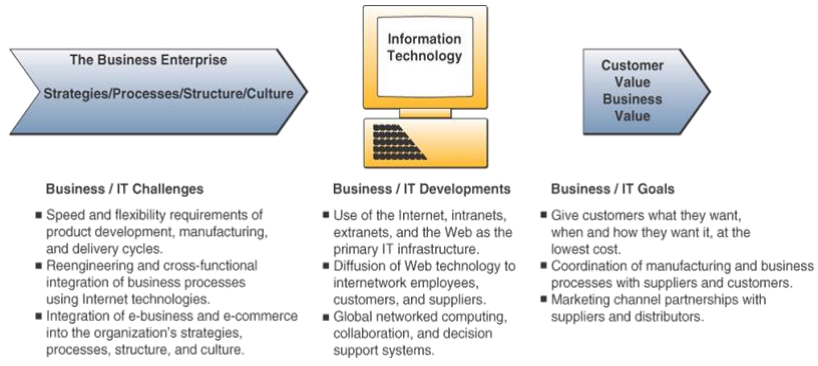
Other Information Systems

- 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

Other Information Systems

- 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

IT Challenges and Opportunities



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

Challenges and Ethics of IT

- Application of IT
  - Customer relationship management
  - Human resources management
  - Business intelligence systems
- Potential Harm
  - Infringements on privacy
  - Inaccurate information
  - Collusion

IT Careers

- Jobs driven by…
  - Growth in system / software design and related services
  - Enabling web technologies
  - Information sharing and connected environments
  - The need for those with problem-solving skills
  - Falling hardware and software prices and open source technologies which fuel expanded computerisation of operations

The IS Function

- The IS function is…
  - 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 dynamic and challenging career opportunity
  - A key component of today's networked business

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

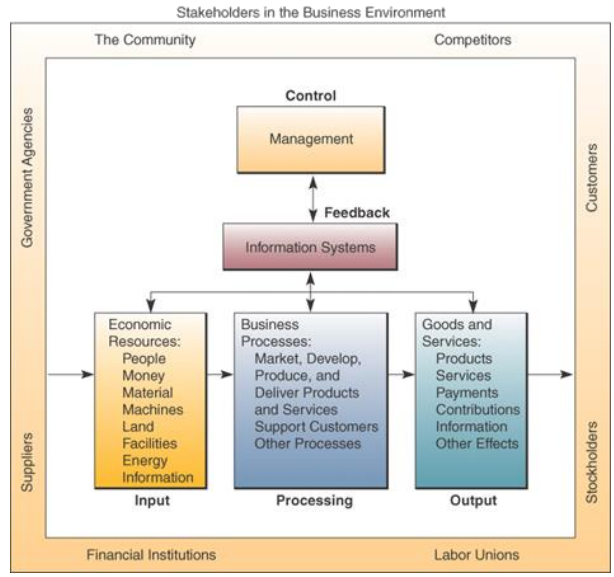
What is a System?

- 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

Basic Functions of a System

- Input
  - Capturing and assembling elements that enter the system to be processed
- Processing
  - Transformation process that converts input into output
- Output
  - Transferring transformed elements to their ultimate destination

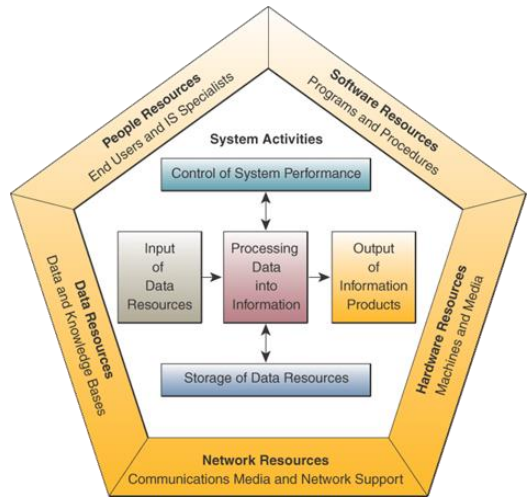
A Business as a System



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**

Components of an IS



Information System Resources

- People Resources
  - Specialists
  - End users
- Hardware Resources
  - Machines
  - Media
- Software Resources
  - Programs
  - Procedures

Information System Resources

- Data Resources
  - Product descriptions, customer records, employee files, inventory databases
- Network Resources
  - Communications media, communications processors, network access and control software
- Information Resources
  - Management reports and business documents using text and graphics displays, audio responses, and paper forms

Data Versus Information

- **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

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

Recognizing 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