

INTRODUCTION TO INFORMATION SYSTEMS

Data/information/knowledge

- **Data:**
 - Raw fact, unorganized -> needs to be processed to convey any specific meaning
 - Has no content
- **Information:**
 - Data that have been processed/organised -> have meaning value
- **Knowledge:**
 - Data/info that have been organised and processed to convey understanding and accumulated learning.
- In some cases, info cannot help us to solve the problems -> use our knowledge

What is IS?

- A set of interrelated components that collect/receive data/info process, analyse, organise, store and distribute info for a specific purpose.
- Components of computer based IS:
 - IT {
 - **Hardware:** routes, computers, servers (physical sides of the systems)
 - **Software:** programming, operating systems (linux, windows)... (intangible)
 - **Database:** a place to store data
 - **Network:** transfer data, communicate, connect...
 - **Procedures:** processes for everything to happen
 - **People**
- IT: support info-processing

Three activities in IS that product info that organisations need:

- **Input:** captures/ collects raw data from internal/ external organisation environment
- **Processing:** converts raw input -> meaningful form
- **Output:** transfers that processed info to people/ activities that need it

Major capabilities of IS

- Perform high-speed, high-volume numerical computations
- Provide fast communication and collaboration
- Store huge amounts of info
- Allow quick and inexpensive access to vast amounts of info
- Automate business processes and manual tasks

Why are IS important? - IS facilitate and support:

- Operational excellence
- Keeping enough inventories
- New product, service
- Customer and supplier intimacy
- Improved decision making
- Competitive advantage

Why study IS?

- Become an informed user
 - Benefits from IT resources/applications
 - Helps enhance quality of IT resources
 - Recc & help select IT applications
 - Is aware of new technologies
 - Get more value from technology
- Explore career opportunities in IT
- Take part in managing info resources

Business/IT alignment

- Good B/IT alignment:
 - View IT as an engine of innovation
 - Rotate business and IT across departments
 - Provide goals that are clear to each IT and business employee
- Reasons for poor B/IT alignment:
 - Different objectives
 - Ignore each other's expertise
 - Lack of communication

Lec 3 IS within the organisation

TRANSACTION PROCESSING SYSTEMS (TPS)

- **Operational managers:** **routines questions** + track the flow of transactions
- Daily operational task
- Produces info for other systems
- 2 types:
 - Batch processing: collects data -> places them in groups -> processes groups periodically
 - Online transaction processing (OLTP): transactions are processed online AS SOON AS THEY OCCUR

DECISION SUPPORT SYSTEMS (DSS)

- **Middle managers**
- Support the performance of **managerial analysis** or **NON-routine decisions**
 - **What-if-analysis:** checks the impact of the change in a variable
 - **Sensitive analysis:** checks the impact **on other variables** when one variable changed repeatedly
 - **Goal seeking analysis:** finds the input to achieve a goal
 - **Optimisation analysis:** finds the optimum value for a target
- Use info from TPS

EXECUTIVE SUPPORT SYSTEMS (ESS)

- **Senior managers**
- Address Strategic issues + long-term trends
- Address **NON-routine decision making**
- **Summarize** the performance of the firm along **key dimensions**
- Present content on DIGITAL DASHBOARD/ portal with web interface

FUNCTIONAL AREA INFORMATION SYSTEMS

- **IS for Production/ Operations Management:**
 - Transforms inputs into USEFUL outputs: Inventory management, Quality control
- **IS for Accounting and Finance:**
 - Expense management
 - Control and auditing: how the money is being spent -> financial health
- **IS for HRM:**
 - Recruitment: find > evaluate > hiring decisions
 - HR planning and management: payroll and employees' records, benefits administration,...
- **IS for Marketing:**
 - IS helps with the sales process (and other types of support)

How do organisations use networks to improve their operations?

- Networks support organisations in all types of functions:
 - **Discovery:** enables users to search and access data sources, in all topic areas, on the web through using search engines and portals
 - **Search engines** search for specific info by key words and report the results
 - **Meta search engines** search several engines at once and integrate the findings of the various search engines to answer queries posted by users
 - **My student portal:** web-based, personalised gateways to info and knowledge that provide relevant info from different sources using advanced search and indexing techniques
 - **Communication:** enables users to communicate through communication technologies such as
 - Email and instant messaging (IM)
 - Web-based call centres (customer care centre): services that provide effective personalised customer contact as an important part of web-based customer support
 - Electronic chat rooms: virtual meeting place where groups of regulars come to chat
 - **Collaboration:** enables users to work together to accomplish certain tasks through applying collaborative services (Google Docs, Microsoft SharePoint)
 - **Distance learning and E-learning**
 - **Distance learning:** any learning situation in which teachers and students **do not meet face-to-face**
 - **E-learning:** **learning supported by the web** (can take place inside classrooms as a support to conventional teaching. i.e. students work on the web during class)
 - Benefits: self-paced learning increases content retention, online materials deliver high-quality, the flexibility of learning from any place at any time at their own pace, learning time generally is shorter, more people can be trained due to faster training time, training costs can be reduced...
 - Drawbacks: instructor may need training, the purchase of additional multimedia equipment, students must be computer literate and may miss the face-to-face interaction, issues with assessing students' work, required internet connection,...
 - **Telecommuting:** a process in which highly prized knowledge workers are able to work anywhere anytime

	For employees	For employers
advantages	<ul style="list-style-type: none"> • Reduced stress, improved family life • Employment opportunities for single parents and persons with disabilities 	<ul style="list-style-type: none"> • Increased productivity • Ability to retain skilled employees
disadvantages	<ul style="list-style-type: none"> • Feelings of isolation • No workplace visibility • Potential for slower promotions 	<ul style="list-style-type: none"> • Difficulties in supervising work • Potential info security problems • Additional training costs

- **Implementation:** the process of converting from an old computer stem to a new one
 - Major conversion strategies:
 - **Direct conversion:** the old system is cut off and the new system is turned on at a certain time
 - **Pilot conversion:** introduces the new system in one part of the organisation -> if works properly, implement in other parts of the organisation
 - **Phased conversion:** introduces components of the new system in stages -> each module is assessed -> if works properly, other modules are introduced until the entire new system is operational
 - **Parallel conversion:** old and new systems operate simultaneously for a time (expensive, time-consuming, enter data twice)
- **Operation and maintenance**
 - The new system will operate for a period of time until it no longer meets its objectives
 - Systems require several types of maintenance
 - **Debugging the program:** finding errors and removing
 - **Updating:** modify the system to accommodate changes in business conditions

Tools/ approaches for systems development

- **Prototyping:** building a small version of the system (prototype) and then refines the system based on users' feedback
- **Integrated computer-assisted software engineering (ICASE)**
 - Computer-aided software engineering (CASE) tools: group of tools that automate many of the tasks in SDLC
 - **Upper Case Tools:** automate the early stages of the SDLC (systems investigation, analysis and design)
 - **Lower Case Tools:** automate the later stages in the SDLC (programming, testing, operation and maintenance)
 - **Integrated CASE (ICASE) Tools:** provide links between the upper CASE and lower CASE tools

Alternative Methods for Systems Development

- **Joint Application Design (JAD):**
 - A **group-based approach** for collecting user requirements and creating system designs
 - Most often used within the systems analysis and systems design stages of the SDLC
 - System analysts/developers and users jointly define, review and agree on the requirements
- **Rapid Application Development (RAD):**
 - Combine JAD, prototyping and integrated computer-assisted software engineering (ICASE) tools for rapidly produce a high-quality system
- **Agile development:**
 - A methodology that delivers functionality in rapid iterations (**repetition**)
 - Requirements and solutions evolve through collaboration between self-organizing, cross-functional teams
 - Requires **frequent** communication and collaboration, development, testing and delivery

