Introduction and System Concepts

CSE1204/IMS1001 Information Systems 1
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No Tutorials Week One

- Use Allocate + for tutorial allocation – no exceptions
- If you have a problem with tutorial allocation, contact – Christina Branton
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Teaching Staff

- Unit Leader: Dr Ilona Jagielska
- Lecturers: Dr Ilona Jagielska & Dr Rob Meredith
- Tutors: Jacob Zhivov & Nishita Patel

Make sure you obtain your tutor’s contact details and the location and times your tutor is available for student consultation
Unit Information

- All unit materials are available from the unit web site:
  - www.sims.monash.edu.au/subjects/cse1204
  - or
  - www.sims.monash.edu.au/subjects/ims1001

Prescribed text


Copies available at CITSU Bookshop

Assessment

- exam - 60%, assignment - 40%
- a pass requires a final mark of 50% or more
- hurdle - you must earn a minimum of 40% for the exam AND a minimum of 40% for the assignments
- Eg.
  - Practical mark = 35/40 = 87.5%
  - Exam mark = 20/60 = 33%
  - Total mark = 55/100 = FAIL !
  - If either hurdle is not met, a result of 44% will be recorded even if the total mark is > 50%
Assignments

- Assignments must be submitted according to the School of Information Management and Systems’ assignment submission requirements
- These are available at: www.sims.monash.edu.au/resources/assessment.html
- The School’s style guide for printed assignments is available at: www.sims.monash.edu.au/resources/style.html

Aim of the Unit

- The nature, purpose and makeup of computerised Information Systems
- What you should know about Information Systems if you intend to work with them
- Analysts viewpoint: IS project initiation; system development methods; system design

This lecture’s objectives

- Understand what we mean when we talk about systems:
  - system concepts and components
  - understand the need for information systems
  - Introduction to roles and tasks associated with building information systems
A System

- An assembly of components that interact in an organised way to accomplish goals
- E.g. river systems, nervous system, public transport system, legal system, education system, water supply system, elevator system, information system, a business.
- Note – not all systems are 'computer systems.'

A System

- system elements
  - a boundary
  - a purpose
  - an environment
  - interfaces
  - inputs, processes, outputs
  - feedback
  - constraints
  - subsystems

Systems

Simple <------------- Complex
Open <------------- Closed
Stable <------------- Dynamic
Permanent <------------- Temporary
System Elements

- **Purpose**
  - the overall goal or function of a system:
    - access to medical services
- **Process**
  - the transformation of inputs into outputs:
    - coin to Coke
- **Boundary**
  - the line that divides the system from its environment:
    - Buttons, handset, on a phone

System Elements (ctd.)

- **Environment**
  - everything external to the system that interacts with it
    - Telephone line? Caller?
  - The system exchanges inputs and outputs with its environment
    - Inputs – what is taken from the environment:
      - button press, speech
    - Outputs – what is given back to the environment:
      - Audio, electrical signals

System Elements (ctd.)

- **Interfaces** – points where inputs and outputs occur; where the system interacts with it’s environment
  - Screen
  - Keyboard
  - Voice prompt/voice recognition
  - Customer Service Representative
  - Purchasing Officer
System Elements (ctd.)

- The environment may be always changing:
  - busy; smoke; war; dry; cancellation, business competition
- Feedback and control loop allows the system to adapt to its environment:
  - "Press OK to continue"; monitor
- Constraints – limits on what a system can accomplish
  heart pacemaker; Challenger

System example: a business

- Its environment:
  - general population + an industry + business climate + government etc.
- Its inputs:
  - materials + services + new employees + equipment + facilities + money + orders etc.
- Its outputs:
  - products/services + waste materials + payments +
  retired employees + old equipment etc.
- Its feedback/control loops:
  - customer complaints + new knowledge necessary to make
  required changes to product etc.
- Subsystems:
  - payroll system, stock system, human resources system, governance system

An Information System

A set of processes, tools and people to manage information
Systems thinking

- The application of formal systems theory and concepts to systems problem solving
- Helps us understand how systems are organised and how they work
- Simplifies inherent system complexity
- Useful to apply systems thinking to understanding of business organisations ("organisations as systems") and their information systems

Data vs. Information

- Data – consists of raw or unstructured facts (text, pictures, sound)
  - eg. Student number, date
- Information – data that has been refined for a particular purpose: a collection of facts organised so that they have meaning and use to a particular recipient in a particular context. It has additional value beyond the value of the facts themselves.

Information characteristics

- Useful information is essential if an organisation is to achieve its goals:
  - accurate  complete  economical
  - flexible  reliable  relevant
  - simple  timely  verifiable
  - Accessible  secure
- An information system is designed to produce such information
Business organisations are complex systems

- Business organisations organise their activities and work practices into various systems because:
  - many different tasks must be done
  - different data are needed for different tasks
  - a single task is often done many times
  - complex processes must be coordinated
  - the environment changes constantly

How can Information Systems help?

- Efficiency, reliability, economy, control
- An Information System is a formal arrangement of people, tools, processes
- Integrated to
  - manage complexity
  - support and improve business operations
  - Support and improve the problem-solving and decision-making activities of managers.

Computer-Based Information Systems

- Information systems may or may not involve the use of computers
- Computers significantly expand the potential of information systems because they:
  - are more reliable processors than humans
  - are faster than humans, and “tireless”
  - are easily replicated
  - are much more productive
  - have enormous memory capacity
Information System Components

- Information system components include:
  - people – need the information, build the system, operate it and use it
  - data and information – the raw material which the system is set up to manage and distribute
  - machines (usually computers) – help manage and process the data and information
  - procedures – define how the information is to be input/stored/processed/etc.
    - formal – specified, perpetual, expected
    - informal – unspecified, trivial, one-off

Functions of an Information System

Any information system performs four main functions:

- data input – capturing information
- data storage/retrieval – keeping information
- data processing – transforming information
- data output – displaying/presenting information

Benefits of Information Systems

- A good information system ensures:
  - the right information
  - to the right degree of accuracy
  - when it is required
  - in the right format/layout
  - to the right people
  - in the most efficient way possible

(Have you had to deal with an information system which did not work well? Which of these things was not present in that system?)
The Complexity of Information Systems

Even small information systems can be very complex:
- many components (lots of information)
- much interaction between components
- systems within systems (subsystems)
- the intangibility of information (hard to define)
- the subjective nature of information (interpretation)
- differing needs of different system users

Computer-based information systems

- “unique” situations:
  - customer enquiry system; ticket booking
- generic business applications:
  - payroll systems; inventory systems
- Types of information systems e.g.:
  - transaction processing systems,
  - decision support systems,
  - expert systems,
  - executive information systems,
  - geographical information systems

Building Information Systems

- Activities involved in building computer-based information systems are:-
  - identifying business information problems
  - analysing and describing information needs
  - designing solutions to meet those needs
  - acquiring/building new systems
  - implementing new systems
System building players

- System owner/s
- System user/s
- Project leader (manager)
- Systems analyst/s
- Systems designer/s
- Systems builder/s (programmers, hardware technicians)
- IT vendor/s and consultant/s

The Role of the Systems Analyst (our focus in this course)

- to understand the information needs
  - what information is needed?
  - for whom?
  - in what form?
  - when?
- to describe the system’s information flows and processes
- to identify problems, opportunities, constraints
- to suggest possible system solutions
- Similar to an architect – understanding a client’s needs and designing a solution

References