INTRODUCTION AND REVIEW OF THE SDLC

Lecture 1

Teaching Staff

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Subject Information

- Prescribed Text:

- Recommended/Additional Reading

Assessment

- 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

So if.....
- Practical mark = 35/40 = 87.5%
- Exam mark = 20/60 = 33%
- Total mark = 55/100 = FAIL!!

Because the Exam mark is less than 40% the officially recorded result will be a fail
Your Responsibilities

- You are responsible for your own learning
- We help you with information and services
- You must:
  - read widely, ask questions, think
  - practice the techniques that you learn
- If you have a problem: LET US KNOW
  - Tutor -> Lecturer -> Director of Undergraduate Studies -> Deputy Head of School -> Head of School

Lecture Objectives

- Review of information system concepts and components
- Review of the SDLC (Systems Development Life Cycle) as a basis for the task of building information systems

What You Should Already Know

- The nature of business problems
- The use of computer based information systems to solve business problems
- Different types of information system
- The role of the systems analyst in the information systems development process

Subject topics

- Systems Analysis issues and techniques:
  - Process Modelling review
  - Data Modelling
  - Normalisation of data

Subject topics

- Design and Implementation issues and techniques:
  - Generating and evaluating design alternatives
  - System architecture
  - Interface design
  - Alternative development strategies
  - Implementation - testing, conversion, acceptance planning, documentation
  - Maintenance and Review

Review: Information Systems

“An Information System (IS) is an arrangement of people, data, processes, information presentation, and information technology that interact to support and improve day-to-day operations in a business as well as support the problem-solving and decision-making needs of management and users.”

Whitten, Bentley and Dittman (2001), p. 8
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 the data and information
- Procedures - define how the information is to be input/stored/processed/etc (formal or informal)

Functions of an Information System

Any information system performs four main functions:
- data input - recording information
- data storage/retrieval - keeping information
- data processing - transforming information
- data output - displaying/presenting information

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
- the intangibility of information (hard to define)
- the subjective nature of information (variability)

Building Information Systems

Activities involved in building computer-based information systems are:
- Identifying information problems
- Analyzing and describing information needs
- Designing solutions to meet those needs
- Acquiring/building new systems
- Implementing new systems

Systems Development Life Cycle (SDLC)

The SDLC provides:
- a systematic and orderly approach to solving business problems
- a means of managing, directing, monitoring and controlling the process of system building:
  - a description of the process - steps to be followed
  - deliverables - reports/programs/documentation/etc
  - milestones - dates of completion of steps, or deliverables
**Initiation (Why?)**

- Is this project worth doing?

**Analysis - ‘what is happening’**

- Define the clients requirements (What?)

**Design**

- Define how the system will be implemented
Implement - 'build’

- Build and deliver the system

• Build and test programs
• Prepare users for new system
  - acceptance testing, user documentation, user training, maintenance procedures
• Finalise system and technical documentation
• Install the system

Implementation

- Build/modify databases and networks as required
- Build and test programs
- Prepare users for new system
  - acceptance testing, user documentation, user training, maintenance procedures
- Finalise system and technical documentation
- Install the system

Review

- What went wrong/right? Why?

- How well were the system objectives met?
  - Clients requirements met within budget, on time
- Can further benefits be realised?
- Are major changes required?
- How successful was the development process...
  - what can we learn?
- Review the maintenance effort

Review

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Maintenance

- Fix it / Make it better

- Corrective - fix errors
- Adaptive - satisfy changing needs
- Perfective - enhance performance
- Preventative - fix potential problems

- If the cost of maintenance is too high consider other options:
  - new development, purchase package, re-engineer

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Cross Life Cycle Activities are those which overlap many or all of the life cycle phases. Some of these are:

- Quality - must be embedded in the process of systems development to achieve a quality outcome
- Project Management - to monitor and control the project and ensure it stays on track
- Documentation - essential at every stage to help ensure project and system viability
- Ethics - voluntary compliance with guidelines of IS professional societies

Quality

- Quality is defined as fitness for purpose and concerns both process and product.
- Error detection and correction in analysis and design is much cheaper than after the system is implemented.
- Achieving quality requires that organisational structures, responsibilities, procedures, processes and resources for implementing quality management are in place.
  - Total Quality Management (TQM), Continuous Process Improvement (CPI), Business Process Re-engineering (BPR), Benchmarking, Capability Maturity Model (CMM)

Project Management

- Select systems development methodology
- Plan the project tasks
- Estimate the resources and time required to complete individual phases of the project
- Staff the project team
- Organise and schedule the project effort (tasks/time/people/technical resources) and therefore cost
- Control the project development (directing the team, controlling progress, replan, restaff, …)
- Communication, business, IT and accounting skills

Documentation

- The data dictionary plays an important role during and after systems development:
  - A repository for information about and definitions of all “objects” identified during development
  - It supports and is maintained throughout the system lifecycle
  - It provides an important source for other system documentation

Professional Ethics

- Australian Computer Society (ACS)
- Your reputation
- Your client’s interests
- Confidentiality
  - Your client’s and their competitors’
- Impartiality
- Honesty

Building Information Systems: The Role of the Systems Analyst

- To understand the business’s information needs
  - what information is needed?
  - for whom?
  - in what form?
  - when?
- To describe the business’s information flows
- To identify problems and opportunities
- To suggest possible system solutions
Analysis and Design in the SDLC

- Compare with the role of an architect in building a house
- Analysis - finding out WHAT the client needs
- Design - deciding HOW to meet these needs
- Distinction between the two is not always as clear in practice as it sounds in theory as they tend to merge in practice (compare architect’s role)

The Role of the Systems Analyst

- A systems analyst needs to be able to relate well to a wide range of different sorts of people:
  - business management
  - system users and owners
  - technical people (programmers, database programmers, systems administrators, operations staff, data communications and network specialists
  - consultants
  - vendors
- Critical Systems Thinking (CST), problem solving, communication, business and IT skills

References

  Chapter 1,2,3
  Chapter 1,3,4