Lecture 1

Introduction and Review of the SDLC

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Subject Information

All materials (lectures, tutorials, assignments, notices) on the subject web page at the SIMS website


Or, follow the links on SIMS main page

- SIMS Units - 2005 → First Year → IMS1002 or CSE1205

Prescribed Text

Recommended/Additional Reading

Tutorials This Week

No tutorials this week (week 1)

Use Allocate+ for tutorial allocation

If you have a problem with tutorial allocation, contact
- Terri Wall - Ph: 9903 1468
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If you have a problem with unit allocation contact the Faculty office
Subject Information

- 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 exam mark is less than 40% the officially recorded result will be a fail

Your Responsibilities

- You are responsible for your own learning
  - outcomes are generally directly proportional to effort
- We help you with information, direction and services
- You must
  - read widely, ask questions, think
  - practice the techniques that you learn
  - eat green vegetables, drink lots of water, plenty of sleep!
- If you have a problem – let us know!!

  - Tutor → Lecturer → Unit Leader → Director of Undergraduate Studies → Deputy Head of School → Head of School

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

Lecture Objectives

- Preview of this unit
- Review of information system concepts and components
- Review of the Systems Development Life Cycle – SDLC
  - as a basis for the task of building information systems

Subject Topics

- The Analysis and Design phases of the System Development Life Cycle in detail
- 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

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 information, problem-solving and decision-making needs of the management and users of an organisation
  Whitten, Bentley and Dittman (2004), p. 12

Information Systems Components
- Information System components include
  - People
    - need the information, build the system, operate it and use it
  - Data and Information
    - the raw and processed 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 IS
- 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 an IS
- 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
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

Systems Development Life Cycle - SDLC

Initiation – ‘is it worth doing?’
- A preliminary investigation of the problems, opportunities, constraints and available resources to decide on a course of action
  - enhance existing system
  - develop a new information system
  - do nothing .. add it to the backlog
- Which IS project is the ‘best’ one to do

Analysis – ‘what is happening?’
- Define the clients requirements (What?)

Initiation

- Is this project worth doing?
- Planned development project
- Unplanned development project

Pre-Feasibility Report (scope defined)
- Feasibility Report
- Constraints
- Problem/opportunity details

ANALYSIS
- Survey Project
- Feasibility
- System Owners

Analysis

- Analyse the problem and define requirements
- System Requirements Specification Report
- System Owners
- Analyse the problem and define requirements

Design

- Define the clients requirements (What?)
- System Requirements Specification Report

“Don’t try to fix it unless you understand it”
Study the existing system, to thoroughly understand the problems and opportunities
Review findings with clients and revise scope if necessary
Clearly define WHAT the new system must do
Agree on acceptance criteria for the new system - signed systems specification
– should the system spec. be frozen?
Assess feasibility again

Design – ‘how will it happen?’

Generate a number of design options based on technical, operational, economic, scheduling and tendering constraints (HOW?)
The client selects the best option for their needs - assess feasibility again
Acquire the necessary hardware and software
Design interfaces, databases, networks as required
Specify integration requirements and software requirements (programs)

Implementation – ‘build it’

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

Maintenance
- Fix it / Make it better

Cross Life Cycle Activities
- Cross Life Cycle Activities are those which overlap many or all of the life cycle phases
  - 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
- Risk Management
- Stakeholder Management
Project Management

- 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

- Documentation is part of the product
- Requirements, technical design specifications
- User, training, systems, operations manuals
- 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
- Integrity

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)

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

   Chapters 1, 2, 3

   Chapters 1, 3, 4