Systems Analysis and Design
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Summer 2003

Introduction to the Course

- Course structure
  - Lectures: material from the Dennis text
  - Labs: in-lab assignments, demonstrations, and consulting hours
  - Course web site: http://www.bus.sfu.ca/bus362
  - Office hours:
    Me: Thursday “open door” after class until 5:30 PM
    TAs: To Be Announced
Course Deliverables

- Major project: 30%
  - analysis of a real-world system
  - As-is: system description (process and data)
  - To-be: process model, data model, interface mock-up (for computerized components)
  - done in teams
    - up to four people (not five)
    - all teams marked the same regardless of number
    - teamwork assessment at the end of the course

Course Deliverables

- Assignments: 20%
  - nine assignments during the term
  - done in groups of up to four (not five)
    - may be same groups as major project
    - may be different groups
  - lab time and supervision is provided for completion of the assignments
  - each assignment is due the following week at the start of class
    - late assignments are not accepted
    - each group must register for each assignment using the student information system (see course home page)
    - keep a copy so that we may go over the tricky bits in class
Course Deliverables

- Midterm exam: 20%
  - held in Week 8
  - covers planning and analysis stages
- Final exam: 30%
  - closed book
  - covers entire course

Blind Design Project

- As-is model
  - create a model of the current business process
  - graphical or semi-graphical
- Requirements specification
  - identify the high-level requirements for a better business process
- System concept (to-be model)
  - describe the new business processes and any systems used to support the process
An Information System

- Objectives
  - automate
  - informate

- Building blocks
  - data (database)
  - automation (programming language)
  - interface (forms, reports, etc.)

Introduction

Chapter 1
Key Ideas

Many failed systems were abandoned because analysts tried to build wonderful systems without understanding the organization.

The primarily goal is to create value for the organization.

Key Ideas

The systems analyst is a key person analyzing the business, identifying opportunities for improvement, and designing information systems to implement these ideas.

It is important to understand and develop through practice the skills needed to successfully design and implement new information systems.
THE SYSTEMS DEVELOPMENT LIFE CYCLE

Major Attributes of the Lifecycle

- The project --
  - Moves systematically through phases where each phase has a standard set of outputs
  - Produces project deliverables
  - Uses deliverables in implementation
  - Results in actual information system
  - Uses gradual refinement
Project Phases

- **Planning** (Why build the system?)
- **Analysis** (Who, what when, where will the system be?)
- **Design** (How will the system work?)
- **Implementation** (System delivery)

Planning

- Identifying business value
- Analyze feasibility
- Develop work plan
- Staff the project
- Control and direct project
Analysis

- Analysis
- Information gathering
- Process modeling
- Data modeling

A “Simple” Process for Making Lunch
Design

- Physical design
- Architectural design
- Interface design
- Database and file design
- Program design

Implementation

- Construction
- Installation
Processes and Deliverables

<table>
<thead>
<tr>
<th>Process</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Project Plan</td>
</tr>
<tr>
<td>Analysis</td>
<td>System Proposal</td>
</tr>
<tr>
<td>Design</td>
<td>System Specification</td>
</tr>
<tr>
<td>Implementation</td>
<td>New System and Maintenance Plan</td>
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</tbody>
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SYSTEM DEVELOPMENT METHODOLOGIES
What Is a Methodology?

- A formalized approach or series of steps
- Examples
  - Process-Centered
  - Data-Centered
  - Object-Oriented

Waterfall Development Method
### Pros and Cons of the Waterfall Method

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifies systems requirements long before programming begins</td>
<td>Design must be specified on paper before programming begins</td>
</tr>
<tr>
<td></td>
<td>Long time between system proposal and delivery of new system</td>
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### Alternatives to the SDLC

- Parallel Development
- Rapid Application Development (RAD)
- Phased Development
- Prototyping
- Spiral Development
- Packaged Systems
Parallel Development Method

Pros and Cons of Parallel Development

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduces Scheduled Time</td>
<td>Still Uses Paper Documents</td>
</tr>
<tr>
<td>Less Chance of Rework</td>
<td>Sub-projects May Be Difficult to Integrate</td>
</tr>
</tbody>
</table>
Rapid Application Development

- CASE tools
- JAD sessions
- Fourth generation/visualization programming languages
- Code generators

Oracle’s Designer Tool

Process modeling (with swim lanes)
Oracle’s Designer Tool

Functional decomposition of processing

Oracle’s Designer Tool

Create an Entity-Relationship Diagram
Oracle’s Designer Tool

Specify logical and physical details for entities in ERD

Oracle’s Designer Tool

Generate relational database from CASE tool
Three RAD Categories

- Phased development
  - A series of versions
- Prototyping
  - System prototyping
- Throw-away prototyping
  - Design prototyping

How Prototyping Works
Criteria for Selecting the Appropriate Methodology

- Clear user requirements
- Familiar technology
- Complexity
- Reliability
- Time schedule
- Schedule visibility
TEAM ROLES AND SKILLS

Information Systems Roles

- Business analyst
- System analyst
- Infrastructure analyst
- Change management analyst
- Project manager
Summary

- **The Systems Development Lifecycle** consists of four stages: Planning, Analysis, Design, and Implementation.

- There are five **major development methodologies**: the waterfall method, the parallel development method, the phased development method, system prototyping and design prototyping.

- There are five **major team roles**: business analyst, systems analyst, infrastructure analyst, change management analyst and project manager.