MIS
(Management Information System)
(21-972)

Department of Industrial Engineering
Sharif University of Technology
Session #9

Course Description

* Instructor
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* Class time
  - Saturday-Monday 10:30-12:00

* Course evaluation
  - Mid-term (20%)
  - Final exam (20%)
  - Quiz (10%)
  - Exercise-Projects (30%)

* Mid-term session:
  - Saturday, 7th, Azar 1394

* Final session:
  - Monday, 28th, Dey 1394

* Reference:
Course Description (Continued)

* Reference:
  - William S. Davis, David C. Won, "The information system consultant’s handbook: system analysis and design", 2010, Taylor and Francis
  - Terence Lucey; "Management Information Systems", 2004, Cengage Learning EMEA
  - Gabriele Piccoli; "Information systems for managers: texts & cases", 2007, John Wiley & Sons Inc

* Contents:
  - Introduction to Systems Analysis and Design
  - Analyzing the Business Case
  - Managing System Projects
  - Requirements Modeling
  - Data and Process Modeling
  - Object Modeling
  - Development Strategies
  - User Interface Design
  - Data Design
  - System Architecture
  - Managing Systems Implementation

Course Description (Continued)

* Contents:
  - Requirements Modeling
  - Joint Application Development
  - Rapid Application Development
  - Agile Methods
  - Modeling Tools and Techniques
  - System Requirements Checklist
  - Fact-Finding
  - Interviews
  - Documentation
Modeling Tools and Techniques

- Models help users, managers, and IT professionals understand the design of a system.
- Modeling involves graphical methods and non-technical language to represent the system at various stages of development.
- During requirements modeling, various tools to describe business processes, requirements, and user interaction with the system can be used.
- Systems analysts use modeling and fact-finding interactively - first they build fact-finding results into models, then they study the models to determine whether additional fact-finding is needed.

Functional Decomposition Diagrams

- A functional decomposition diagram (FDD) is a top-down representation of a function or process.
- Using an FDD, an analyst can show business functions and break them down into lower-level functions and processes.
- Creating an FDD is similar to drawing an organization chart - you start at the top and work your way down.
- During requirements modeling, analysts use FDDs to model business functions and show how they are organized into lower-level processes. These processes translate into program modules during application development.
Requirements Modeling

• Modeling Tools and Techniques
• Business Process Modeling
  • A business process model (BPM) describes one or more business processes, such as handling an airline reservation, filling a product order, or updating a customer account.
  • During requirements modeling, analysts often create models that use a standard language called business process modeling notation (BPMN).
  • BPMN includes various shapes and symbols to represent events, processes, and workflows.
  • Using BPMN terminology, the overall diagram is called a pool, and the designated customer areas are called swim lanes.

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Requirements Modeling

- Modeling Tools and Techniques
  - Data Flow Diagrams

  a. Working from a functional decomposition diagram, analysts can create data flow diagrams (DFDs) to show how the system stores, processes, and transforms data.

  b. DFD describes adding and removing books, which is a function shown in the libraries management diagram.

  c. Notice that the two shapes in the DFD represent processes, each with various inputs and outputs.

  d. Additional levels of information and details are depicted in other, related DFDs.
**Requirements Modeling**

- **Modeling Tools and Techniques**
  - **Unified Modeling Language**
    - The Unified Modeling Language (UML) is a widely used method of visualizing and documenting software systems design.
    - UML uses object-oriented design concepts, but it is independent of any specific programming language and can be used to describe business processes and requirements generally.
    - UML provides various graphical tools, such as use case diagrams and sequence diagrams.
  - **Use Case Diagrams**, **sequence diagrams**, and other UML concepts

- **Modeling Tools and Techniques**
  - **Unified Modeling Language**
    - **Use Case Diagram**
      - During requirements modeling, systems analysts and users work together to document requirements and model system functions.
      - A use case diagram visually represents the interaction between users and the information system.

- **Requirements Modeling**
  - **Modeling Tools and Techniques**
    - **Unified Modeling Language**
    - **Use Case Diagram**

<table>
<thead>
<tr>
<th>Name of Use Case</th>
<th>Credit card validation process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Describes the credit card validation process</td>
</tr>
</tbody>
</table>
| **Successful Completion** | 1. Customer clicks the input selector and enters credit card number and expiration date
2. System verifies card
3. System sends authorization message |
| **Alternatives** | 1. Customer clicks the input selector and enters credit card number and expiration date
2. System rejects card
3. System sends rejection message |
| **Precondition** | Customer has selected at least one item and has proceeded to checkout area |
| **Postcondition** | Credit card information has been validated. Customer can continue with order |
| **Assumptions** | None |