MIT

E-Commerce Architecture Project

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UML and Use Cases

for

Object-oriented Analysis
Topics of Discussion

- OOA
- UML
- Use Cases & Business Transaction Scenarios
- Use Case Models
Object-oriented Analysis

“Object-oriented Analysis (OOA) is a method of analysis that examines requirements from the perspective of the classes and objects found in the vocabulary of the problem domain”

- Grady Booch
Object-oriented Analysis

- Analysis Model provides the foundation for the Design Model
- Focus on Hi-level Business Objects
- Concentrate on activities of the User of the business process
- Avoid detailed design tasks
Requirements Analysis

- **Who** are the Users and the Customers?
- **Why** do they want this system?
- Define **what** the business needs to accomplish
- Define Constraints on **how** a solution is manifested but not on **how** system it is designed
- **What is accomplished conceptually**
- **What is required to interface to the system**
- **What is required to operate it**
Enterprise-wide Vs Project-Specific

- Enterprise-wide requirements provide Re-Use
- Requirements common to a project can be obtained by referring to enterprise-wide requirements
- Project-specific requirements should be evaluated for re-factoring into enterprise-wide requirements
The Big Process Picture

- Requirements Analysis process fits into other processes within Integrated Requirements
- Deliverables output from one process become inputs to other processes
- Integrated Requirements provide the glue between the business side and the technology side
Essential Elements for Requirements Analysis

- Clarity
- Efficiency
- Priority
- Quality
- Traceability
- Completeness
- Accuracy
Guidelines for Requirements Analysis

- Problem Vs Solution Evolution
- Abstraction
- Iteration
- Modeling
- Re-Use
UML

- Unified Modeling Language
- Successor to methods of Booch, Rumbaugh & Jacobson
- A modeling language and not a method
The Unified Modeling Language (UML) is the industry-standard language for specifying, visualizing, constructing, and documenting the artifacts of software systems. It simplifies the complex process of software design, making a "blueprint" for construction. The UML definition was led by Rational Software's industry-leading methodologists: Grady Booch, Ivar Jacobson, and Jim Rumbaugh.
Use Cases

- A typical interaction a user has with a system to achieve a goal
- An essential tool in Requirements Capturing
- Provides User-visible function
- Use Cases are part of UML
Some Definitions

- Rectangles
  Indicate a computer system boundary (Human are always outside “systems”)

- Ovals
  Indicate a “use case” and straddle the boundary when a human Actor is involved, or can be inside a system when non-humans are interacting

- Actors
  An actor is a role that an external object or user plays vis the System

- Arrows
  Indicate activity or flow of information
Business Transaction Scenarios

- Business Transaction Scenarios describe all the possible interactions between the system and the external objects of the outside world. BTS are modeled as Use Cases.
- Normal Scenario captures the normal interaction between the actor and the system.
- Abnormal Scenario captures interaction that occurs during exceptions or error conditions.
Sequence Diagrams

A Sequence Diagram provides a diagrammatic representation of a specific instance of a Use Case (a scenario)
Format of Use Cases

Scenarios and Use Cases will have the following sections in this order:

- Purpose
- Assumptions
- Actors
- Use Cases Used
- Use Cases Extended
- Preconditions
- Postconditions
- Basic Course
- Alternate Course
- Rules
- Interface Contraints
- Operational Constraints
GENERAL-PURPOSE CONCEPTS
Can be used on various diagram types

Package, dependency, note

USE-CASE DIAGRAM
Shows the system’s use cases and which actors interact with them

Actor, use case, and association
Business Transaction Scenario: Learning Administration System

Draft 0.2
1. Scenario: Learning Administration System

The Learning Administration System (LAS) depicts the scenario where a student enrolls for a Program or Courses at a Learning Institution, attends the courses scheduled and after completion of the same, applies for various job positions at different companies.
Who are the Actors?

- Admissions Rep
- Admissions Director
- Financial Aid Director
- Education Director
- Instructor
- Career Services Director
- Accountant
Let us model the system
Next Step ...

Let’s get Hands-On

Thank You