System Analysis

CSE 3223

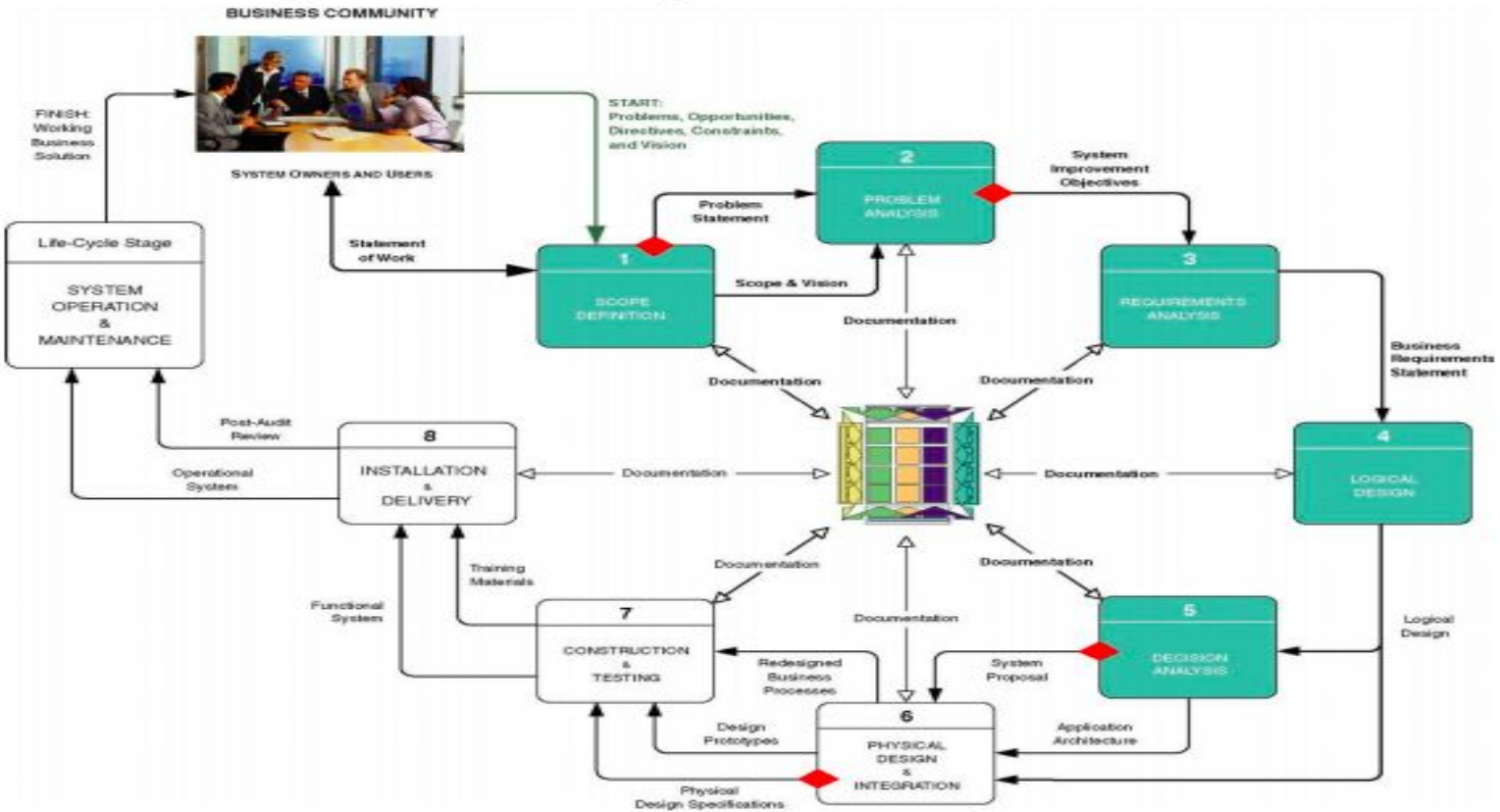
Topic Overview

- Define Systems Analysis
- Describe a number of systems analysis approaches for solving business system problems
- Describe the scope definition, problem analysis, requirements analysis, logical design, and decision analysis phases

Systems Analysis vs. Systems Design

- **Systems analysis** – a problem solving technique that decomposes a system into its component pieces for the purpose of studying how those component parts work and interact to accomplish their purpose.
- **Systems design** – a complementary problem-solving technique that reassembles a system's component pieces back into a complete system hopefully, an improved system. This may involve adding, deleting, and changing pieces relative to the original system.
- **Information systems analysis** - those development phases in an information systems development project that primarily focus on the business problem and requirements, independent of any technology that can or will be used to implement a solution to that problem.

Context of System Analysis



Model Driven Analysis Methods

- **Model driven Analysis** : a problem-solving approach that emphasizes the drawing of pictorial system models to document and validate both existing and/or proposed systems. Ultimately, the system model becomes the blueprint for designing and constructing an improved system.
- **Model** : a representation of either reality or vision. Since, “a picture is worth a thousand words”, most models use pictures to represent the reality or vision.

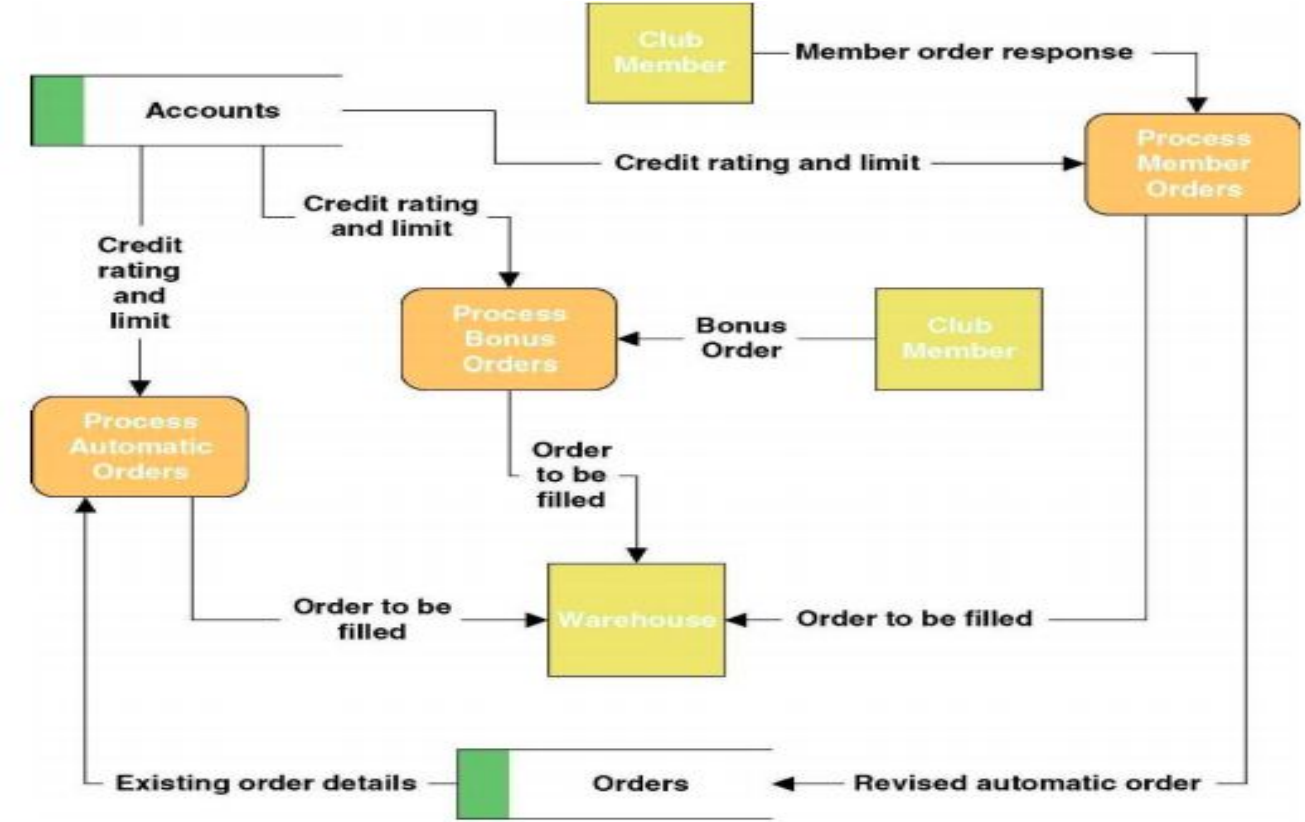
Model Driven Analysis Methods(Cont.)

- **Structured Analysis** : a model-driven, process-centered technique used to either analyze an existing system, define business requirements for a new system, or both. The models are pictures that illustrate the system‘s component pieces: processes and their associated inputs, outputs, and files.
- **Information engineering (IE)**: a model-driven and data-centered, but process-sensitive technique for planning, analyzing, and designing information systems. IE models are pictures that illustrate and synchronize the system‘s data and processes.

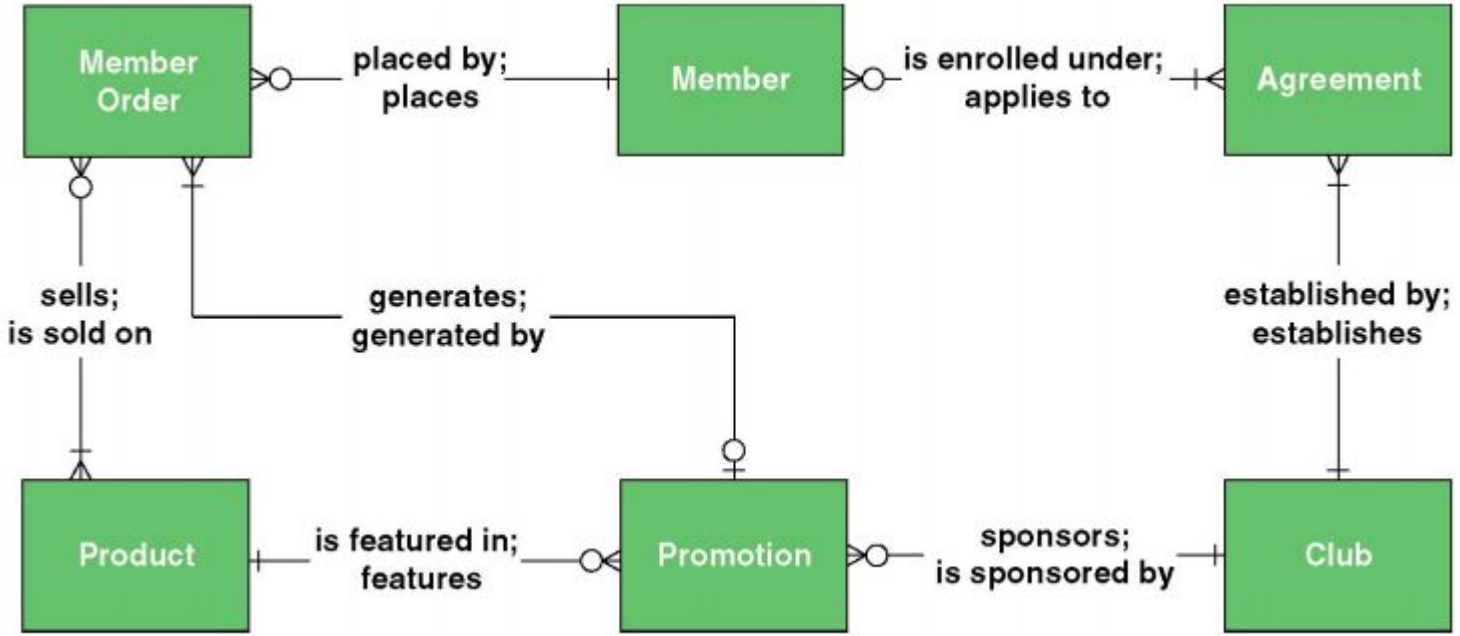
Model Driven Analysis Methods(Cont.)

- **Object-oriented analysis (OOA)** – a model-driven technique that integrates data and process concerns into constructs called objects. OOA models are pictures that illustrate the system‘s objects from various perspectives such as structure and behavior, and interactions of the objects.

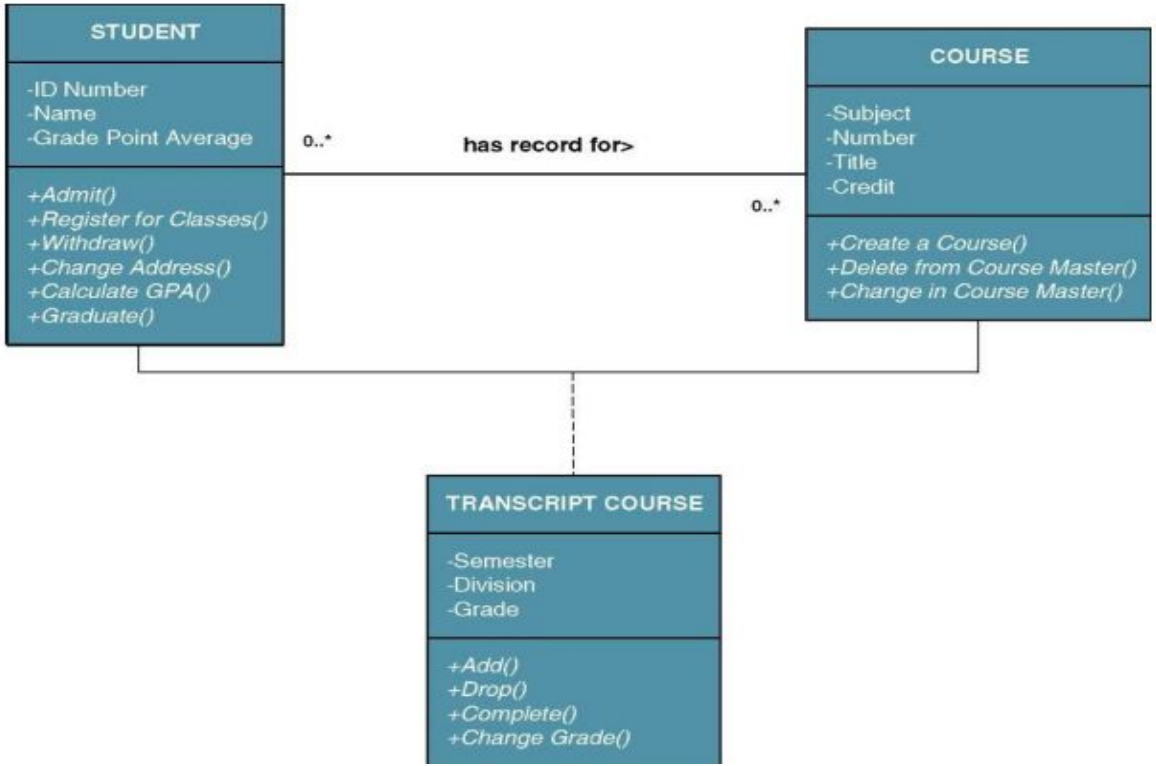
A Simple Process Model



A Simple Data Flow Model



A Simple Object Model



Systems Analysis

- **Prototype :** a small-scale, incomplete, but working sample of a desired system.
- Accelerated systems analysis approaches-
  - Discovery Prototyping
  - Rapid Architected Analysis

Discovery Prototyping

- A technique used to identify the users‘ business requirements by having them react to a quick-and-dirty implementation of those requirements.
- Advantages :
  - Prototypes cater to the “I’ll know what I want when I see it” way of thinking that is characteristic of many users and managers.
- Disadvantages:
  - Can become preoccupied with final “look and feel” prematurely
  - Can encourage a premature focus on, and commitment to, design
  - Users can be misled to believe that the completed system can be built rapidly using prototyping tools

Rapid Architected Analysis

- **Rapid architected analysis :** an approach that attempts to derive system models from existing systems or discovery prototypes.
- **Reverse engineering** : the use of technology that reads the program code for an existing database, application program, and/or user interface and automatically generates the equivalent system model.

Systems Analysis Methods and Agile Methods

- **Agile method :** the integration of various approaches of systems analysis and design for applications as deemed appropriate to the problem being solved and the system being developed.
  - Most commercial methodologies do not impose a single approach (structured analysis, IE, OOA) on systems analysts.
  - Instead, they integrate all popular approaches into a collection of agile methods.
  - System developers are given the flexibility to select from a variety of tools and techniques to best accomplish the tasks at hand,.

Systems Analysis Phases

- Scope Definition Phase
  - Is the project worth looking at?
- Problem Analysis Phase
  - Is a new system worth building?
- Requirements Analysis Phase
  - What do the users need and want from the new system?
- Logical Design Phase
  - What must the new system do?
- Decision Analysis Phase
  - What is the best solution?

Scope Definition Phase

- Tasks-
  - Identify baseline problems and opportunities
  - Negotiate baseline scope
  - Assess baseline project worthiness
  - Develop baseline schedule and budget
  - Communicate the project plan

Problem Analysis Phase

- Tasks-
  - Understand the Problem Domain
  - Analyze the Problems and Opportunities
  - Analyze Business Process
    - Only required for BPR projects
    - Prepare an as-is Process Model
      - Volume of dataflow,Response Time, Delay
    - Prepare an as-is Process Analysis
      - Cost of Process,Value Added by process, **Result of eliminating an process**
  - Establish System Improvement Objectives
  - Update or Refine the Project Plan
  - Communicate Findings and Recommendations

Slide Courtesy

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References

Chapter 5- System Analysis and Design (7th Edition) by Whitten, Bentley and Dittman (Upto Page 184 inclusive)

Thank You