Chapter 12

Systems Design

System Design

Systems design – the specification of a detailed computer-based solution.

- Also called **physical design**.
- systems analysis emphasizes the business problem
- systems design emphasizes the technical or implementation concerns of the system.

System Design Approaches

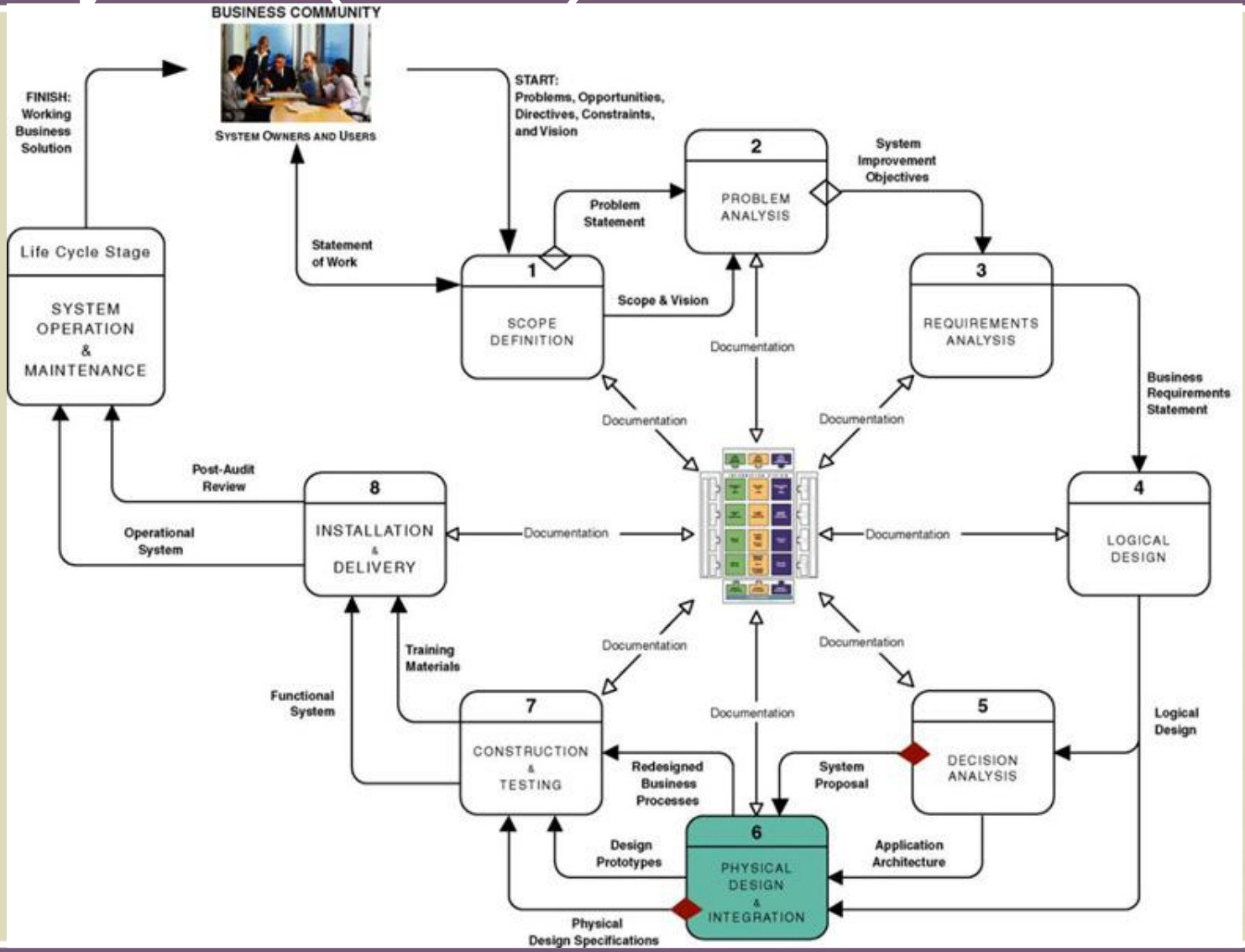
- Model-Driven
  - Modern structured design
  - Information engineering
  - Prototyping
  - Object-oriented
- RAD
- JAD

Model-Driven Approaches – Modern Structured Design

Modern structured design – a system design technique that decomposes the system's processes into manageable components.

- Design in a top-down hierarchy of modules
- Easier to implement and maintain (change).
- Modules should be highly cohesive
  - Accomplish one function only
- Modules should be loosely coupled
  - Minimally dependent on one another

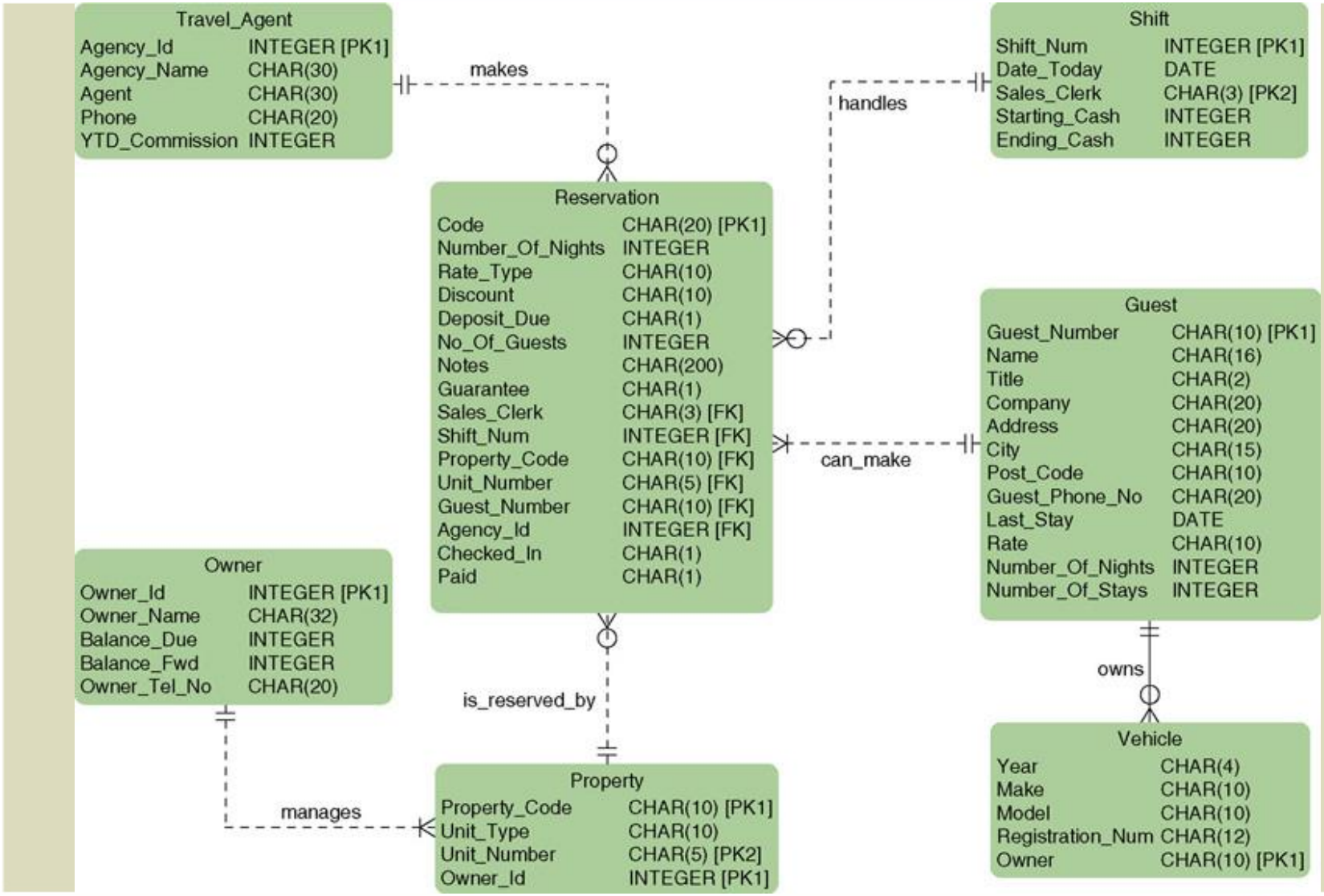
In-House Development Projects (Build)



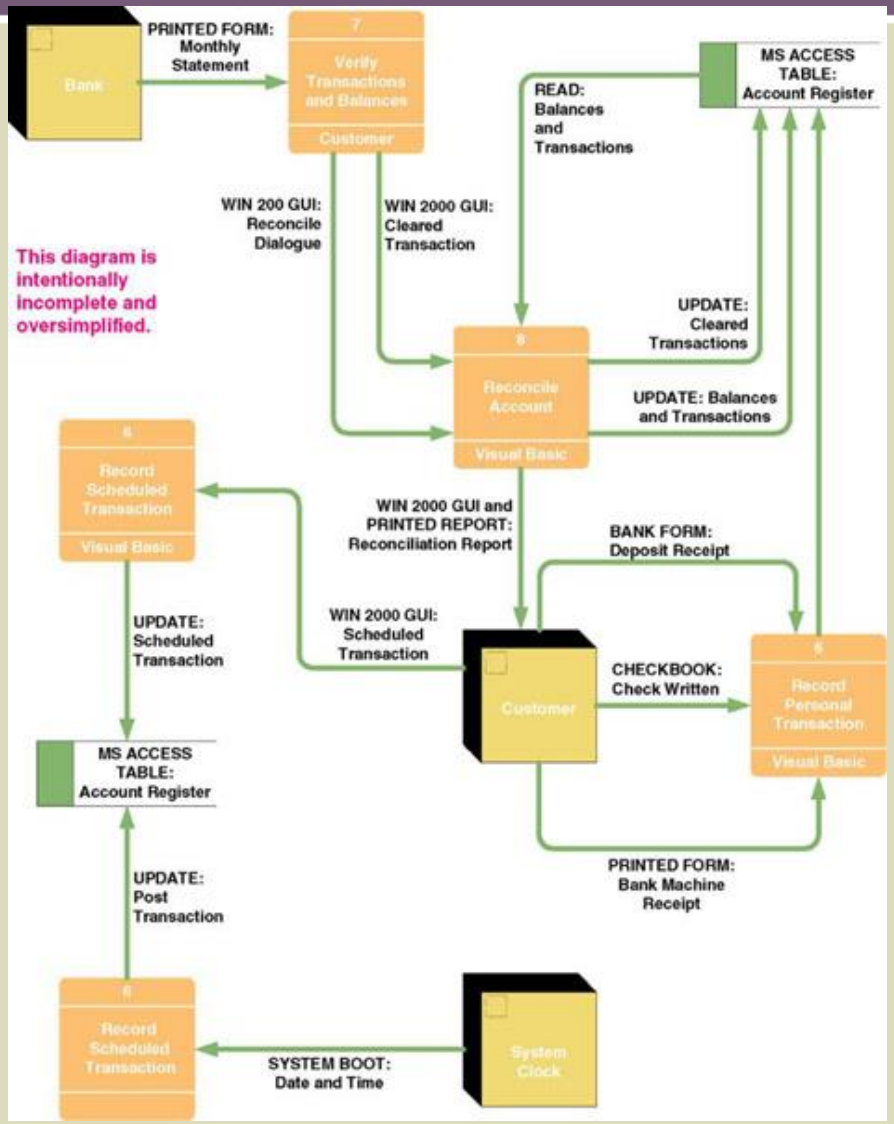
System Design Tasks For In-House Development (Build)

- Design the Application Architecture
  - Define technologies to be used by (and used to build) one, more, or all information systems.
  - Revise models as physical models
- Design the System Databases
  - Database schema
  - Optimized for implementation DBMS
- Design the System Interface
  - Input, output, and dialogue specifications
  - Prototypes
- Package Design Specifications
  - Specifications to guide programmers
- Update Project Plan

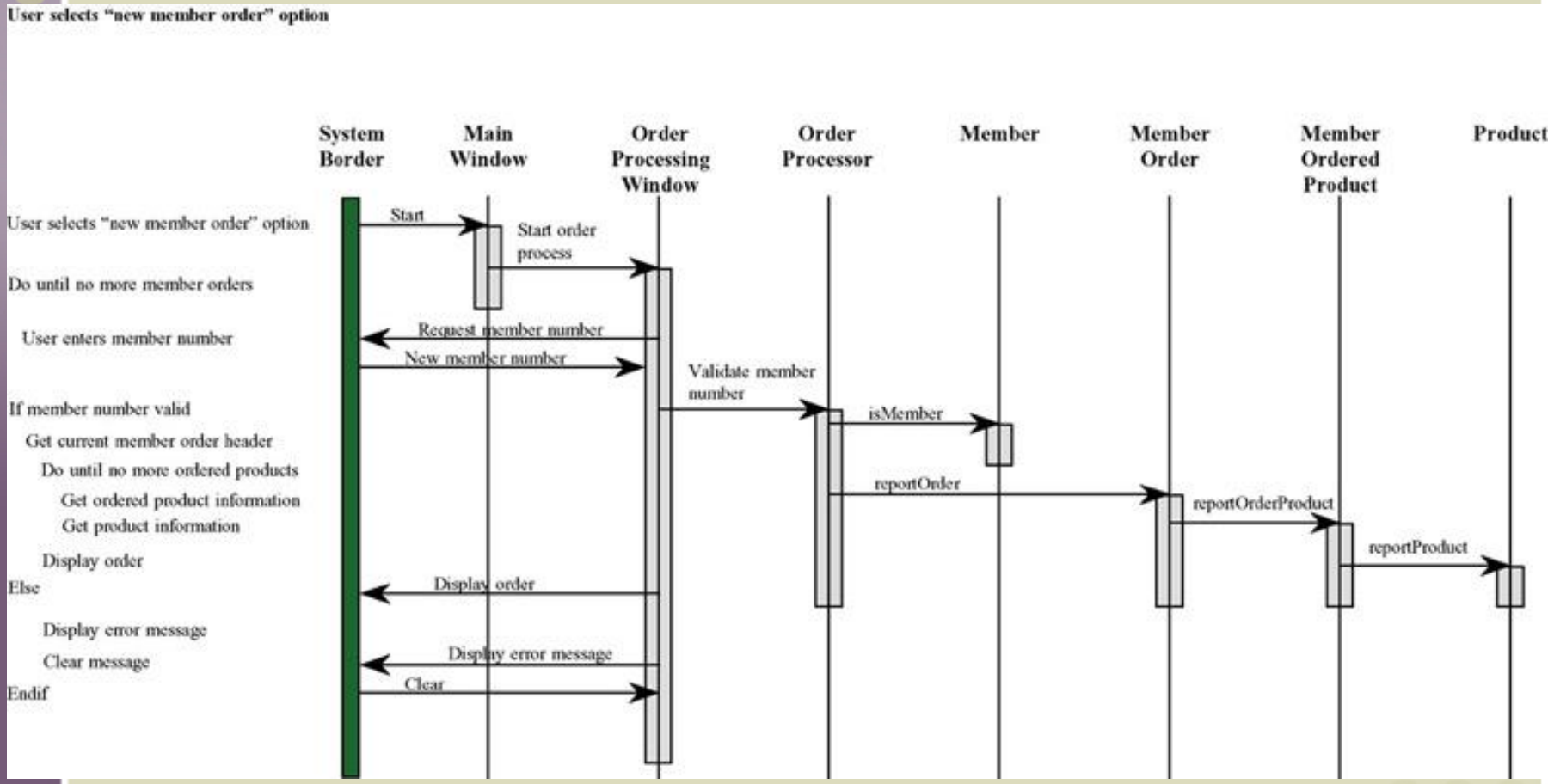
Physical Entity Relationship Diagram



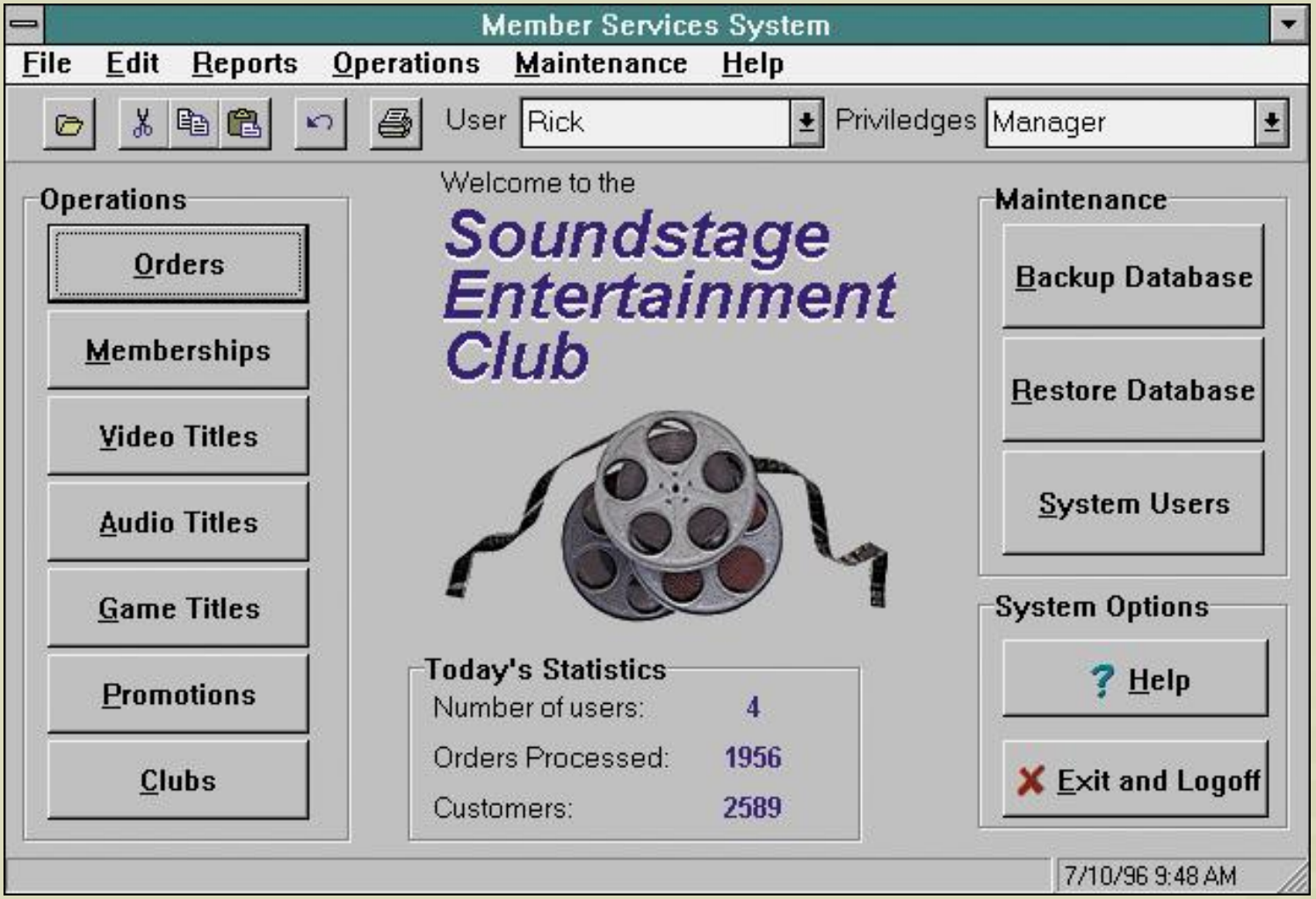
Physical Data Flow Diagram



Object-Oriented Design Model



Dialogue Interface Prototype Screen



Tasks for Procurement

- Procurement:
  - Research Technical Criteria and Options
  - Solicit Proposals or Quotes from Vendors
  - Validate Vendor Claims and Performances
  - Evaluate and Rank Vendor Proposals
  - Award Contract and Debrief Vendors

Impact of Buy Decision on Remaining Life-Cycle Phases

- Must integrate or interface the new system to other existing systems.
- Decision Analysis
  - Make revisions in models to reflect purchased solution.
  - Implement purchased solution.
  - Integration problems lead to revised business requirements statements.
- Design
  - Technical specification for a subset of programs to integrate purchased and built solutions.

Appendix A:Rapid Application Development (RAD)

Rapid application development (RAD) – a systems design approach that utilizes structured, prototyping, and JAD techniques to quickly develop systems.

- The merger of various structured techniques to accelerate systems development
  - Data-driven information engineering
  - Prototyping
  - Joint application development

Appendix B: Typical Request For Proposal Outline

I. Introduction
   A. Background
   B. Brief summary of needs
   C. Explanation of RFP document
   D. Call for action on part of vendor

II. Standards and instructions
   A. Schedule of events leading to contract
   B. Ground rules that will govern selection decision
      1. Who may talk with whom and when
      2. Who pays for what
      3. Required format for a proposal
      4. Demonstration expectations
      5. Contractual expectations
      6. References expected
      7. Documentation expectations

Typical Request For Proposal Outline (cont.)

III. Requirements and features
   A. Hardware
      1. Mandatory requirements, features, and criteria
      2. Essential requirements, features, and criteria
      3. Desirable requirements, features, and criteria
   B. Software
      1. Mandatory requirements, features, and criteria
      2. Essential requirements, features, and criteria
      3. Desirable requirements, features, and criteria
   C. Service
      1. Mandatory requirements
      2. Essential requirements
      3. Desirable requirements
IV. Technical questionnaires
V. Conclusion