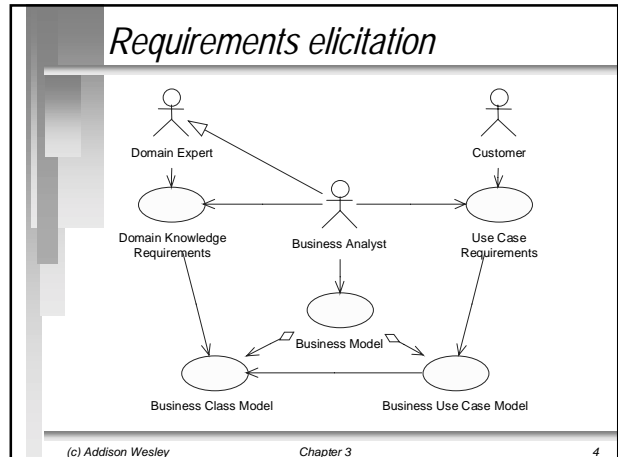


MACIASZEK, L.A. (2001): *Requirements Analysis and System Design. Developing Information Systems with UML*, Addison Wesley

Chapter 3
Requirements Determination

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- Topics*
- Principles of Requirements Determination
 - Requirements Elicitation
 - Requirements Negotiation and Validation
 - Requirements Management
 - Problem Statements for Case Studies
 - Requirements Business Model
 - Requirements Document
- (c) Addison Wesley Chapter 3 2

- Traditional methods of requirements elicitation*
- Interviewing customers and domain experts
 - Questionnaires
 - Observation
 - Study of documents and software systems
- (c) Addison Wesley Chapter 3 5

- Principles of requirements determination*
- Requirements define
 - System services
 - Function requirements
 - Data requirements
 - System constraints
- (c) Addison Wesley Chapter 3 3

- Interviewing customers and domain experts*
- Structured interview
 - Open-ended questions
 - Close-ended questions
 - Unstructured interview
 - Questions to be avoided
 - Opinionated questions
 - Biased questions
 - Imposing questions
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Questionnaires

- In addition to interviews
- Close-ended questions
 - Multiple-choice questions
 - Rating questions
 - Ranking questions

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Modern methods of requirements elicitation

- Prototyping
- Joint Application Development (JAD)
- Rapid Application Development (RAD)

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Observation

- Passive
- Active
- Carried for a prolonged period of time
- People tend to behave differently

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Prototyping

- Throw-away prototype
- Evolutionary prototype

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Study of documents and software systems

- Use case requirements
 - Organizational documents
 - System forms and reports
- Domain knowledge requirements
 - Domain journals and reference books
 - ERPS-s

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JAD

- The membership
 - Leader
 - Scribe
 - Customers
 - Users
 - Managers
 - Developers

(c) Addison Wesley Chapter 3 12

RAD

- Evolutionary prototyping
- CASE tools
- Specialists with Advanced Tools (SWAT)
- Interactive JAD
- Timeboxing

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Requirements management

- Requirements identification and classification
- Requirements hierarchies
- Change management
- Requirements traceability

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Requirements dependency matrix

| Requirement | R1 | R2 | R3 | R4 |
|-------------|----------|---------|---------|----|
| R1 | X | X | X | X |
| R2 | Conflict | X | X | X |
| R3 | | | X | X |
| R4 | | Overlap | Overlap | X |

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Requirements identification and classification

- Unique identifier
- Sequential number with document hierarchy
- Sequential number with requirement's category
- Database generated unique identifier

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Requirements risks

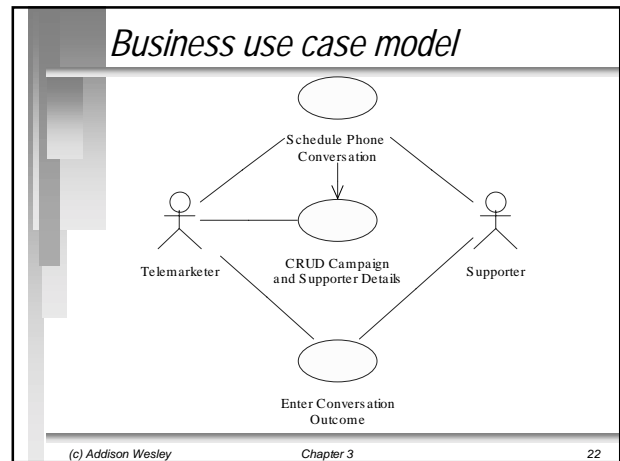
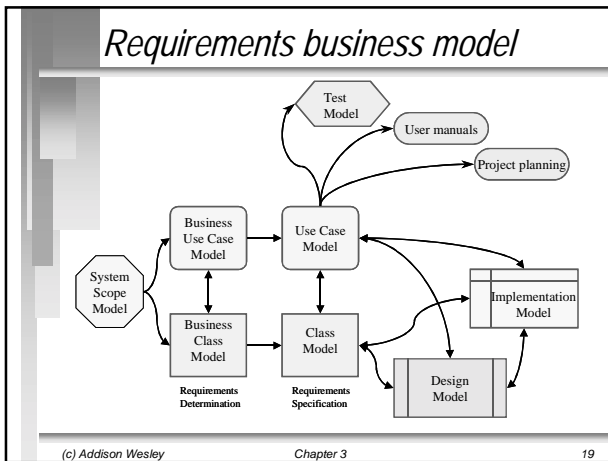
- Technical
- Performance
- Database integrity
- Development process
- Political
- Legal
- Volatility

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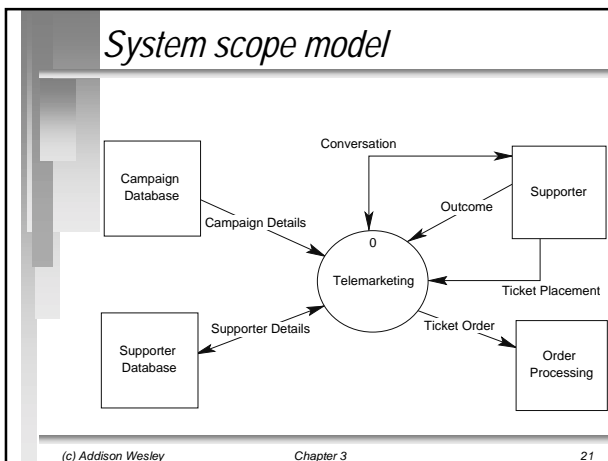
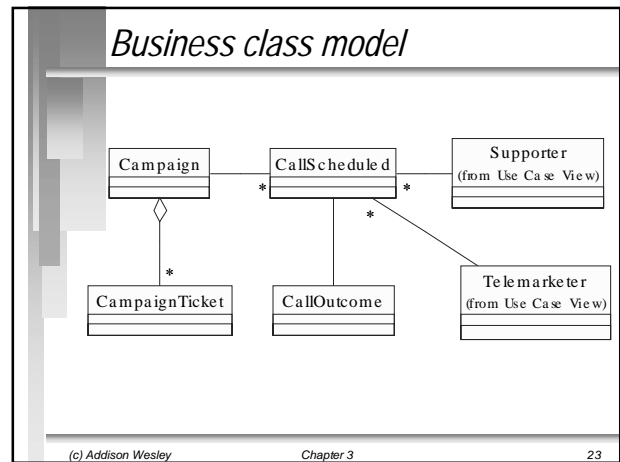
Requirements hierarchies

1. "The system shall schedule the next phone call to a customer upon telemarketer's request."
 - 1.1 "The system shall activate Next Call push button upon entry to Telemarketing Control form or when the previous call has terminated."
 - 1.2 "The system shall remove the call from the top of the queue of scheduled calls and make it the current call."
 - 1.3 etc.

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- ### Telemarketing example
- **Telemarketing**
 - The campaigns are planned on recommendation from the society trustees
 - The campaigns have to be approved by the local government
 - The design and planning of campaigns is supported by a separate Campaign Database application system
 - There is also a separate Supporter Database that stores and maintains information about all past and present supporters – used to select supporters to be contacted in a particular campaign
 - Orders from supporters for lottery tickets are recorded during telemarketing for perusal by the Order Processing system
 - Order Processing System maintains status of orders in the Supporter Database
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Requirements document

Requirements Document
Table of Contents

1. **Project Preliminaries**
 - 1.1 Purpose and Scope of the Product
 - 1.2 Business Context
 - 1.3 Stakeholders
 - 1.4 Ideas for Solutions
 - 1.5 Document Overview
2. **System Services**
 - 2.1 The Scope of the System
 - 2.2 Function Requirements
 - 2.3 Data Requirements
3. **System Constraints**
 - 3.1 Interface Requirements
 - 3.2 Performance Requirements
 - 3.3 Security Requirements
 - 3.4 Operational Requirements
 - 3.5 Political and Legal Requirements
 - 3.6 Other Constraints
4. **Project Matters**
 - 4.1 Open Issues
 - 4.2 Preliminary Schedule
 - 4.3 Preliminary Budget

Appendices
Glossary
Business Documents and Forms
References

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Project preliminaries chapter

- Targets managers and decision makers
- Begins with purpose and scope of the project
- Makes a business case for the system
- Identifies stakeholders
- Offers initial ideas for the solution
- Includes an overview of the rest of the document

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Project matters chapter

- Open issues
 - Future requirements
 - Current requirements to be implemented in the future – enhancements
 - Potential problems once when the system deployed
- Preliminary schedule
 - Human and other resources
 - Planning charts (PERT, Gantt)
- Preliminary budget
 - Project cost – range rather than figure

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System services chapter

- Dedicated to the definition of **system services** -what the system must accomplish
- Likely to account for more than half of the entire document
- Contains high-level requirements business models
 - **Context diagram** (the system scope)
 - **Business use case diagram** (function requirements)
 - **Business class diagram** (data requirements)

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Appendices chapter

- Glossary
 - Terms
 - Acronyms
 - Abbreviations
- Documents and forms
 - Examples of completed (filled in) forms
- References
 - To books and other published sources
 - Meetings' minutes, memoranda, internal documents

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Chapter 3

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System constraints chapter

- Dedicated to the definition of system constraints - how the system is constrained when accomplishing services with regard to
 - Interface requirements
 - Performance requirements
 - Security requirements
 - Operational requirements
 - Political and legal requirements
 - Other constraints
 - Usability
 - Maintainability

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Summary

- **Requirements determination** is about discovering requirements and documenting them
- Two lines of discovery – the discovery from the **domain knowledge** and from the **use cases**
- **Methods of requirements elicitation** include interviewing customers and domain experts, questionnaires, observation, study of documents and software systems, prototyping, JAD and RAD
- **Requirements negotiation and validation** to resolve overlaps and conflicts
- Requirements have to be **managed**
- **Requirements business model** uses diagrams – Context Diagram, Business Use Case Diagram, and Business Class Diagram
- The resulting document is called the **Requirements Document**

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