Chapter 3 (custom text)

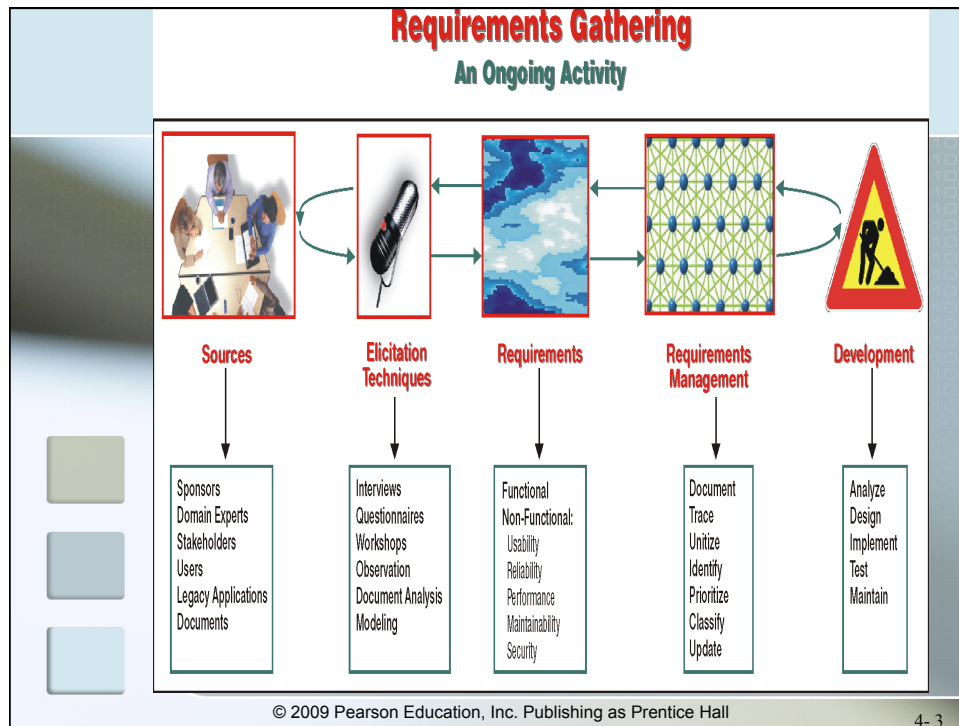# Gathering Requirements

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Chapter Topics

- Define requirements
- Requirements discovery
- Classifying requirements
- Techniques for eliciting requirements
- Managing requirements
- The case history of Walden Hospital, the main source for examples in this book

Requirements Gathering
An Ongoing Activity

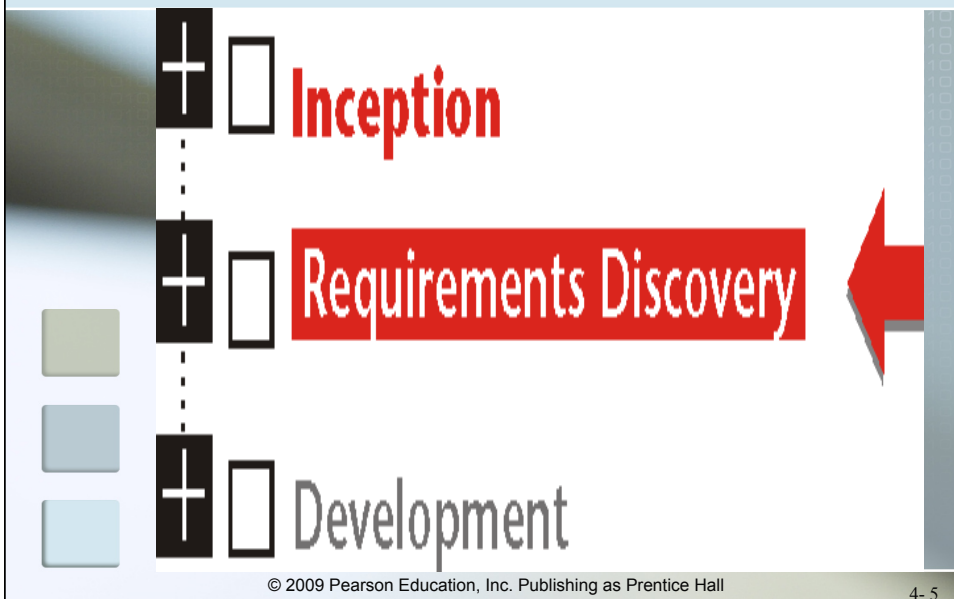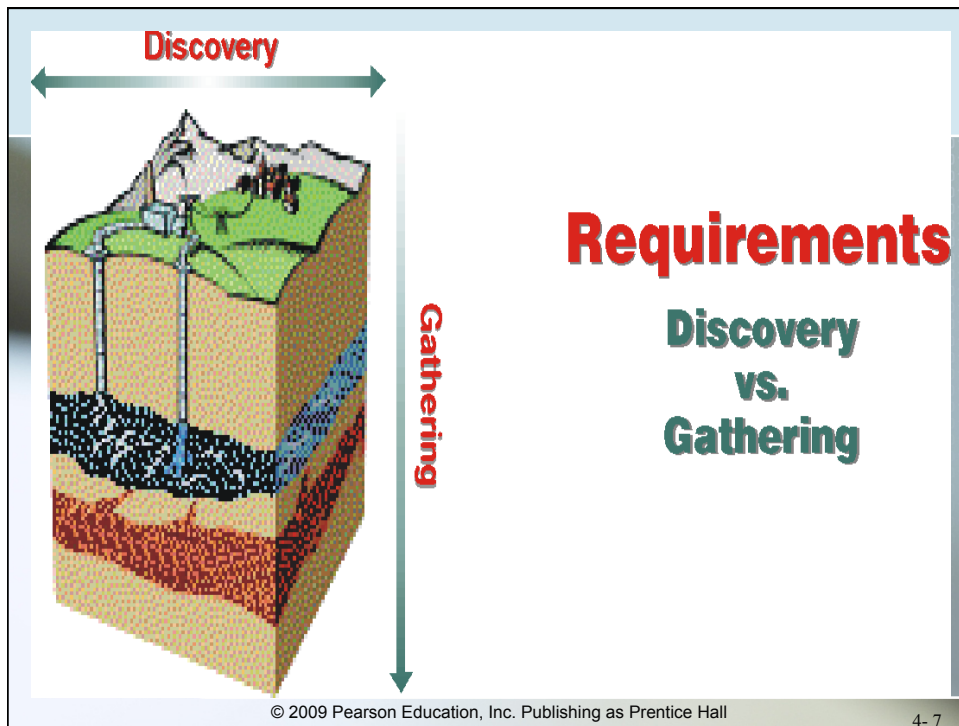| Sources	Elicitation Techniques	Requirements	Requirements Management	Development
Sponsors	Interviews	Functional	Document	Analyze
Domain Experts	Questionnaires	Non-Functional:	Trace	Design
Stakeholders	Workshops	Usability	Unitize	Implement
Users	Observation	Reliability	Identify	Test
Legacy Applications	Document Analysis	Performance	Prioritize	Maintain
Documents	Modeling	Maintainability	Classify	
		Security	Update	

4- 3

Requirements Gathering

- The task of requirements gathering is to collect and define all features that the information system must have in order to fulfill the objectives that the customer has set.

- The reliability and the correctness of requirements is dependent on their sources, on the techniques that we employ to elicit and verify them, and on their effective management.

4- 4

2

Requirements Discovery

+ ☐ Inception

☐ Requirements Discovery ⬅

+ ☐ Development

4- 5

Requirements Discovery

- Requirements discovery identifies the scope and the major objectives of the system. Requirements gathering defines what is needed to reach those objectives.

4- 6

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4- 7

Classifying Requirements

- Requirements fall into two broad categories: functional (or behavioral) and non-functional. Since both relate to the same product, they are interrelated and affect each other:
  - Functional Requirements
    - Functional requirements specify the behavior of the system and the constraints on that behavior.
  - Non-Functional Requirements
    - Non-functional requirements specify non-behavioral properties of the system and the constraints on those properties.

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4- 8

4

Non-Functional Requirements

- Usability
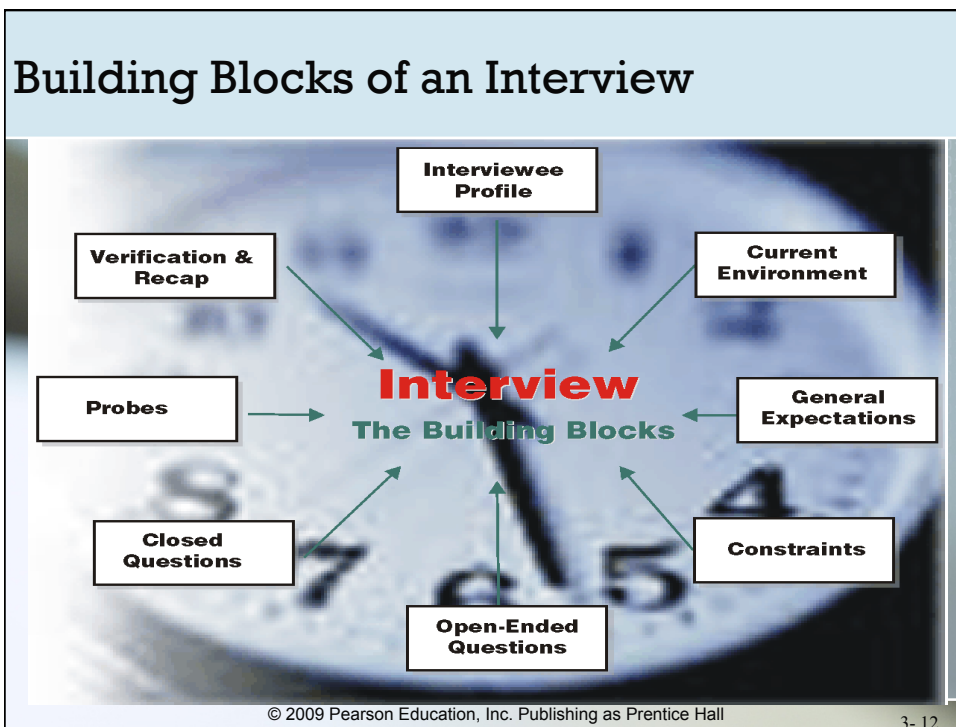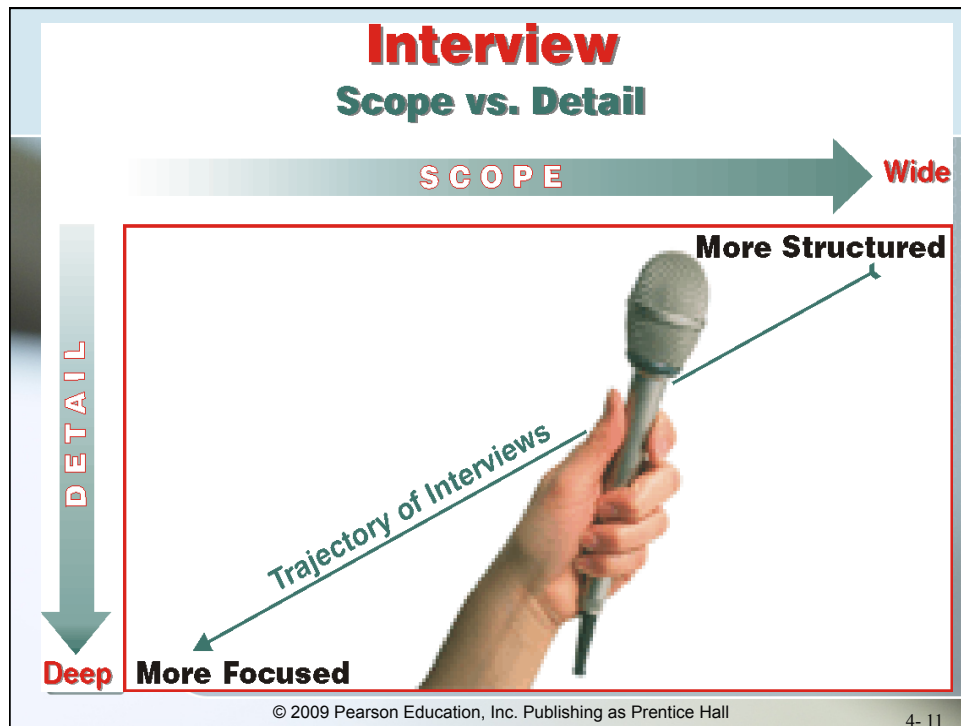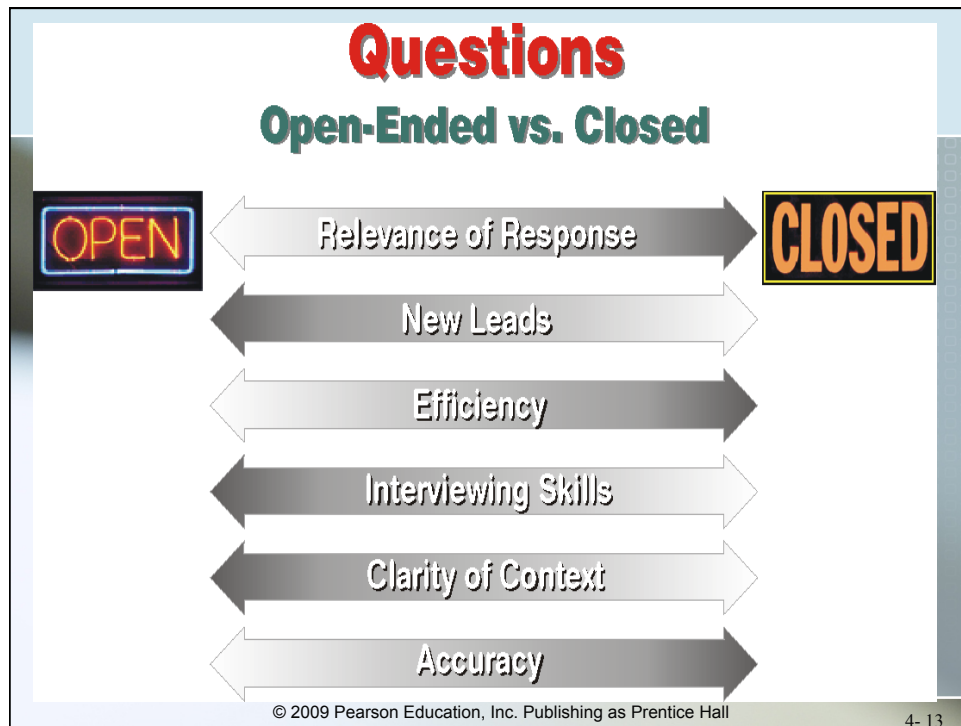- Reliability
- Performance
- Maintainability
- Security

Techniques for Eliciting Requirements

- Interviews
- Questionnaires
- Elicitation Workshops
- Field Trips and Observation
- Modeling
- Mock-Ups

Interview
Scope vs. Detail

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Building Blocks of an Interview

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6

Questions
Open-Ended vs. Closed

OPEN ← Relevance of Response → CLOSED

New Leads

Efficiency

Interviewing Skills

Clarity of Context

Accuracy

4- 13

Questionnaire As Elicitation Tool

- The building blocks of a questionnaire as an elicitation tool are generally the same as in interviews, but the flow is inflexible.

4- 14

7

Questionnaires
Weaknesses & Strengths

Weaknesses

Inflexibility
The flow cannot be changed based on responses.

Misunderstanding
If the question is misleading, there is no chance for immediate clarification.

Limited Interaction
Neither side can learn from the other side's non-verbal or implied responses.

Difficulty of Expression
Talking is easier for most people than writing.

Strengths

Verification
Is the most exact tool for verification.

Traceability
The source of the requirement can be accurately identified.

Relevancy
The respondent is more likely to remain in the boundaries defined by the question.

Structure of Expression
The respondent has more time to ponder the question and prepare the answer.

4- 15

Elicitation Workshops

- Elicitation workshops are the most powerful but also the most expensive tool for requirements elicitation.
- Elicitation workshops are commonly referred to as Joint Application Development (JAD) workshops.

4- 16

8

Workshops

- Planning the Workshop
  - Select participants carefully and help them to help the workshop.
- Conducting the Workshop
  - Conductor of the workshop must encourage free discussion of ideas without losing control of its goal.

Field Trips and Observation

- Field trips provide valuable requirements where workflow is rich in action and interaction.

Modeling

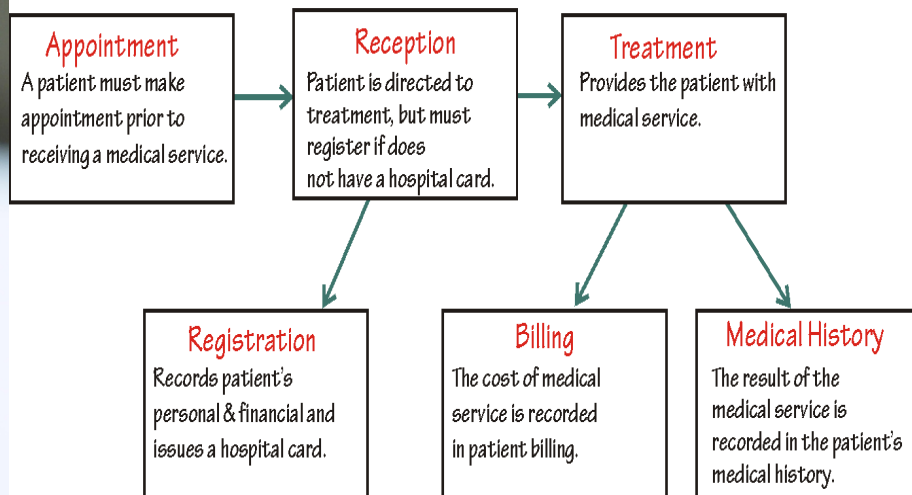- Models for elicitation and verification of requirements must be understandable to stakeholders.
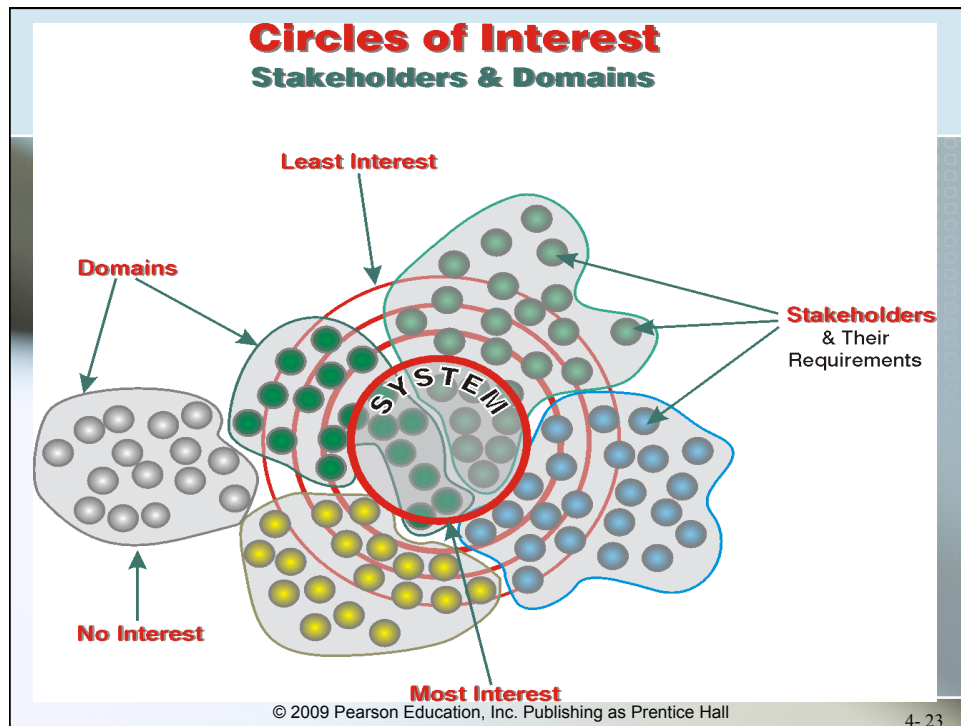
4- 19

An Owner's View
Of Patient Treatment

Appointment
A patient must make appointment prior to receiving a medical service.

Reception
Patient is directed to treatment, but must register if does not have a hospital card.

Treatment
Provides the patient with medical service.

Registration
Records patient's personal & financial and issues a hospital card.

Billing
The cost of medical service is recorded in patient billing.

Medical History
The result of the medical service is recorded in the patient's medical history.

4- 20

10

Mock-Ups

- Mock-ups are approximations of the system's user interface to elicit comments and requirements.

Sources and Authorities

- Sponsors
  - Sponsors are those who launch the project and decide its fate.
- Domain Experts
  - Domain experts are those who are the most knowledgeable about the areas of business activity within the project scope.
- Stakeholders
  - Stakeholders are those whose interests are affected by the operation of the system.

Circles of Interest
Stakeholders & Domains

Least Interest

Domains

SYSTEM

Stakeholders & Their Requirements

No Interest

Most Interest

4-23

Sources and Authorities

- Users
  - Users are those who directly interact with the system.
- Reverse Engineering
  - Legacy applications and existing documents are rich sources of requirements and business rules, but they must be rigorously evaluated and verified.

4-24

12

Managing Requirements

❶ Document and update requirements

❷ Document sources

❸ Separate requirements into distinct units

❹ Uniquely identify each requirement

❺ Verify requirements and document verifications

❻ Prioritize requirements

❼ Classify requirements meaningfully

Case History: Walden Medical Center

We will use Walden's case history in the following chapter as our main example.

WALDEN
MEDICAL CENTER

The History of Walden Medical Center

- The Rise
  - Walden Hospital reached its zenith in 1970's, with more than 500 licensed beds and departments in most areas of hospital medicine.
- The Decline
  - Towards the end of millennium, Walden Hospital was no longer profitable.
- The Revival
  - With the boom market of the late 1990's, the private corporation which owned Walden Hospital decided to herd its capital towards the greener pastures of Dotcoms and put the hospital on the block.

Inception of the Project

- The project has to address four broad, separate but interrelated areas:
  1. **Business & Finance**:
     - Patient Care.
     - Service Cuts.
     - Charity. Bidding.
     - Inventory.
     - Drugs.
     - HMOs
     - Subscription Plan
     - Web Services.
     - Incentives.

Inception of the Project

2. **Organization & Staff**
   - Hierarchy.
   - Alienation.
   - Inertia.
3. **Infrastructure**
   - Neglect.
   - Inadequacy of IS.

4- 29

Inception of the Project

4. **Medical**
   - Outsourcing.
   - Obsolescence.
   - Archives.
   - Drug Inventory.
   - Cost Predicament.
   - Research (Lack of).
   - Accreditations.

4- 30

Initial Requirements

■ The consultant concluded that to achieve the goals of the capital-improvement project, an integrated, comprehensive electronic information system is indispensable.

ID	Requirement	True/False		Comment
001	The product shall replace all current legacy systems.	☐	☐	
001	The product shall automate all clerical functions of patient management in an integrated system.	☐	☐	
003	The architecture of patient management subsystem must be compatible with the architecture of future subsystems within the enterprise-wide system.	☐	☐	
004	Major functions of the system will be: ▪Appointment to receive a medical service. ▪Registration of the patient. ▪Recording of medical services. ▪Recording of costs incurred by the medical service. ▪Patient billing See the attached **context diagram** for patient management.	☐	☐	
005	...			

Next: Domain Analysis

- While requirements identify the features of the product, domain analysis places those feature in the context of business domains.
- We will learn about **problem space** and the **solution space**.
- We will also explore the distinctions between requirements, problems, solutions as methods, and solutions as products.

4- 33

4- 34