Chapter 5:
Requirements Determination

ITU 07302
SYSTEM ANALYSIS AND DESIGN
WITH OBJECT ORIENTED PROGRAMMING

Based on Course Textbook:

Systems Analysis and Design With UML 2.0 An Object-Oriented Approach, Second Edition

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SDLC PHASES

- ☑ PLANNING PHASE
- ☑ **ANALYSIS PHASE**
- ☑ DESIGN PHASE
- ☑ IMPLEMENTATION PHASE

Analysis Phase: Key Ideas

- The goal of the <u>analysis</u> phase is to truly <u>understand</u> the <u>requirements</u> of the new system and develop a system that addresses them.

- The <u>first</u> challenge is finding the right people to participate.

- The <u>second</u> challenge is collecting and integrating the information

What is a Requirement?

A *requirement* is simply a statement of what the system must do or what characteristic it must have. During analysis, requirements are written from the perspective of the businessperson, and they focus on the "what" of the system.

They focus on business user needs, so they usually are called *business requirements* (and sometimes user requirements). Later in design, business requirements evolve to become more technical, and they describe "how" the system will be implemented.

Requirements in design are written from the developer's perspective, and they usually are called *system requirements.* Requirements can be either **functional** or **nonfunctional** in nature.

Functional Requirement

- A *functional requirement* relates directly to a process the system has to perform or information it needs to contain. For example, requirements that state that the system must have the ability to search for available inventory or to report actual and budgeted expenses are functional requirements.

- Functional requirements flow directly into the next steps of analysis (functional, structural, and behavioral models) because they define the functions that the system needs to have.

Non-Functional Requirements

- *Nonfunctional requirements* refer to behavioral properties that the system must have, such as performance and usability. The ability to access the system using a Web browser would be considered a nonfunctional requirement.

- Nonfunctional requirements may influence the rest of analysis (functional, structural, and behavioral models) but often do so only indirectly; nonfunctional requirements are primarily used in design when decisions are made about the user interface, the hardware and software, and the system's underlying physical architecture.

Requirements Gathering Methods

1. Interviews
2. JAD Sessions
3. Questionnaires
4. Document Analysis
5. Observation

1. INTERVIEWS

Interviews -- Five Basic Steps

1. Selecting interviewees
2. Designing interview questions
3. Preparing for the interview
4. Conducting the interview
5. Post-interview follow-up

Selecting Interviewees

- ☑ Based on information needed
- ☑ Often good to get different perspectives
  - ▫ Managers
  - ▫ Users
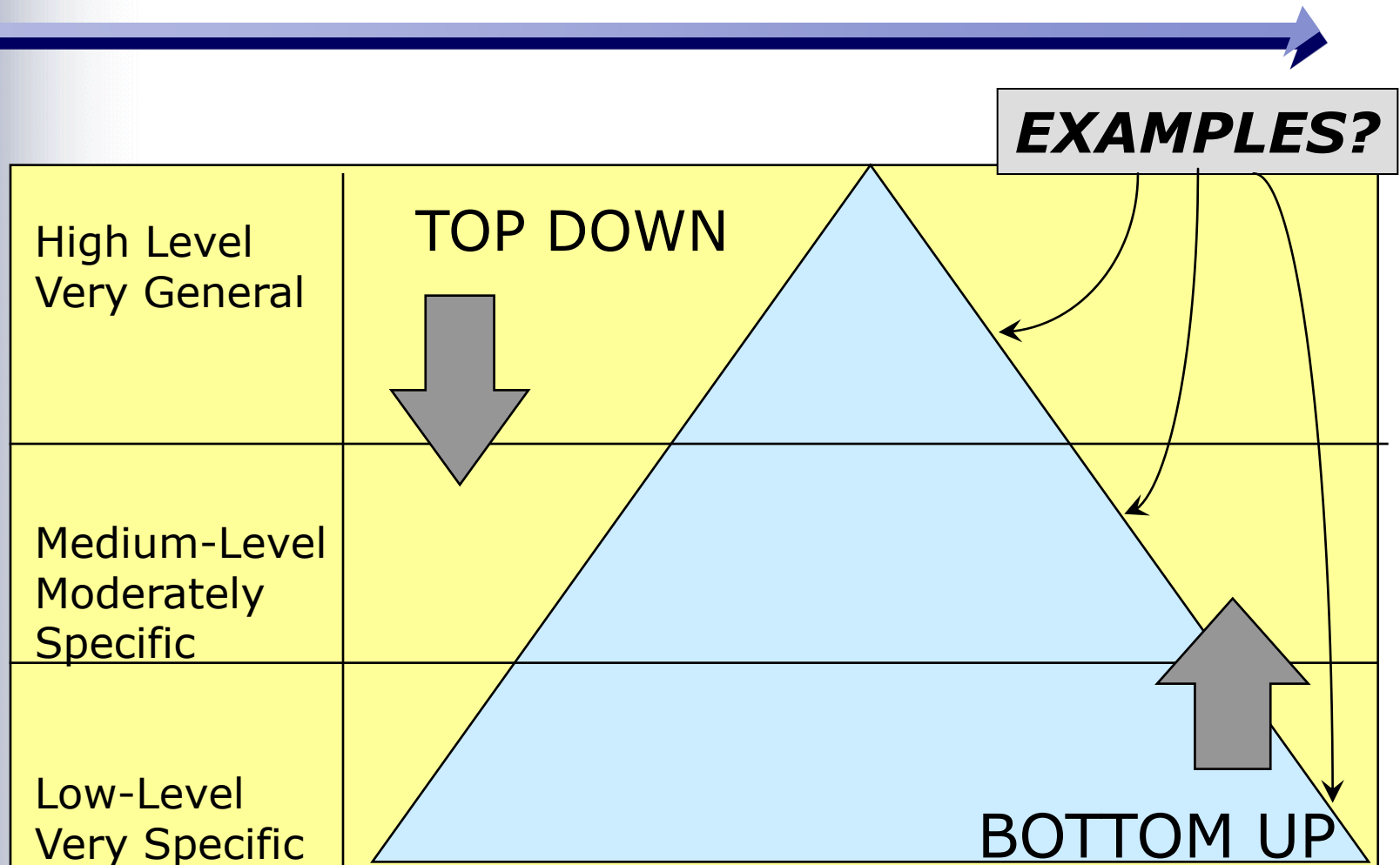 - ▫ Ideally, all key stakeholders

Types of Questions

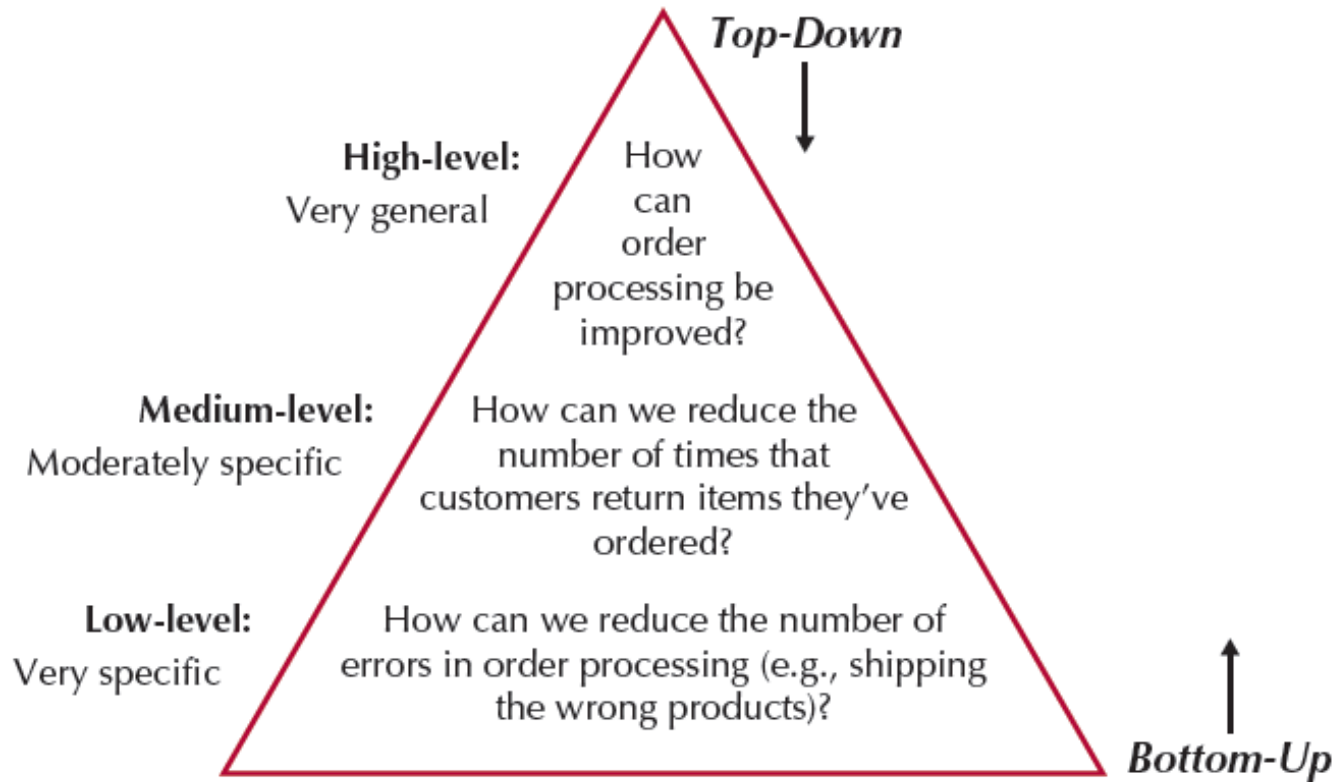| Types of Questions	Examples
Closed-Ended Questions	* How many telephone orders are received per day? * How do customers place orders? * What additional information would you like the new system to provide?
Open-Ended Questions	* What do you think about the current system? * What are some of the problems you face on a daily basis? * How do you decide what types of marketing campaign to run?
Probing Questions	* Why? * Can you give me an example? * Can you explain that in a bit more detail?

Designing Interview Questions

- Unstructured interview
  - Broad, roughly defined information
- Structured interview
  - More specific information

Questioning Strategies

High Level Very General	TOP DOWN
Medium-Level Moderately Specific	
Low-Level Very Specific	BOTTOM UP

EXAMPLES?

Examples

Top-Down

High-level:
Very general

How can order processing be improved?

Medium-level:
Moderately specific

How can we reduce the number of times that customers return items they've ordered?

Low-level:
Very specific

How can we reduce the number of errors in order processing (e.g., shipping the wrong products)?

Bottom-Up

Interview Preparation Steps

- Prepare general interview plan
  - List of questions
  - Anticipated answers and follow-ups
- Confirm areas of knowledge
- Set priorities in case of time shortage
- Prepare the interviewee
  - Inform them of the schedule
  - Tell interviewees reason for interview
  - Inform them of areas of discussion

Conducting the Interview

- Appear professional and unbiased
- Record all information
- Check on organizational policy regarding tape recording
- Be sure you understand all issues and terms
- Separate facts from opinions
- Give interviewee time to ask questions
- Be sure to thank the interviewee
- End on time

Conducting the Interview Practical Tips

- ☑ Don't worry, be friendly
- ☑ Pay attention
- ☑ Summarize key points
- ☑ Be succinct (concise)
- ☑ Be honest
- ☑ Watch body language

Post-Interview Follow-Up

- ☑ Prepare interview notes
- ☑ Prepare interview report
- ☑ Look for gaps and new questions

Interview Report

INTERVIEW REPORT
Interview notes approved by: _____ Person interviewed   _____ Interviewer   _____ Date   _____ Primary Purpose: Summary of Interview: Open Items: Detailed Notes:

2. JOINT APPLICATION DESIGN (JAD) SESSIONS

JAD Key Ideas

- Allows project managers, users, and developers to work together

- May reduce scope creep by 50%

- Avoids requirements being too specific or too vague

Joint Application Design (JAD) Important Roles

- ☑ Facilitator
  - ▫ ensures sticking to agenda
  - ▫ helps understanding of technical terms and jargon
  - ▫ records group input on clearly-viewable display area
- ☑ Scribe (or scribes)
  - ▫ takes minutes and notes
  - ▫ makes copies where necessary

Joint Application Design (JAD) Setting

- ☑ U-Shaped seating
- ☑ Away from distractions
- ☑ Whiteboard/flip chart
- ☑ Prototyping tools
- ☑ e-JAD

JAD Meeting Room
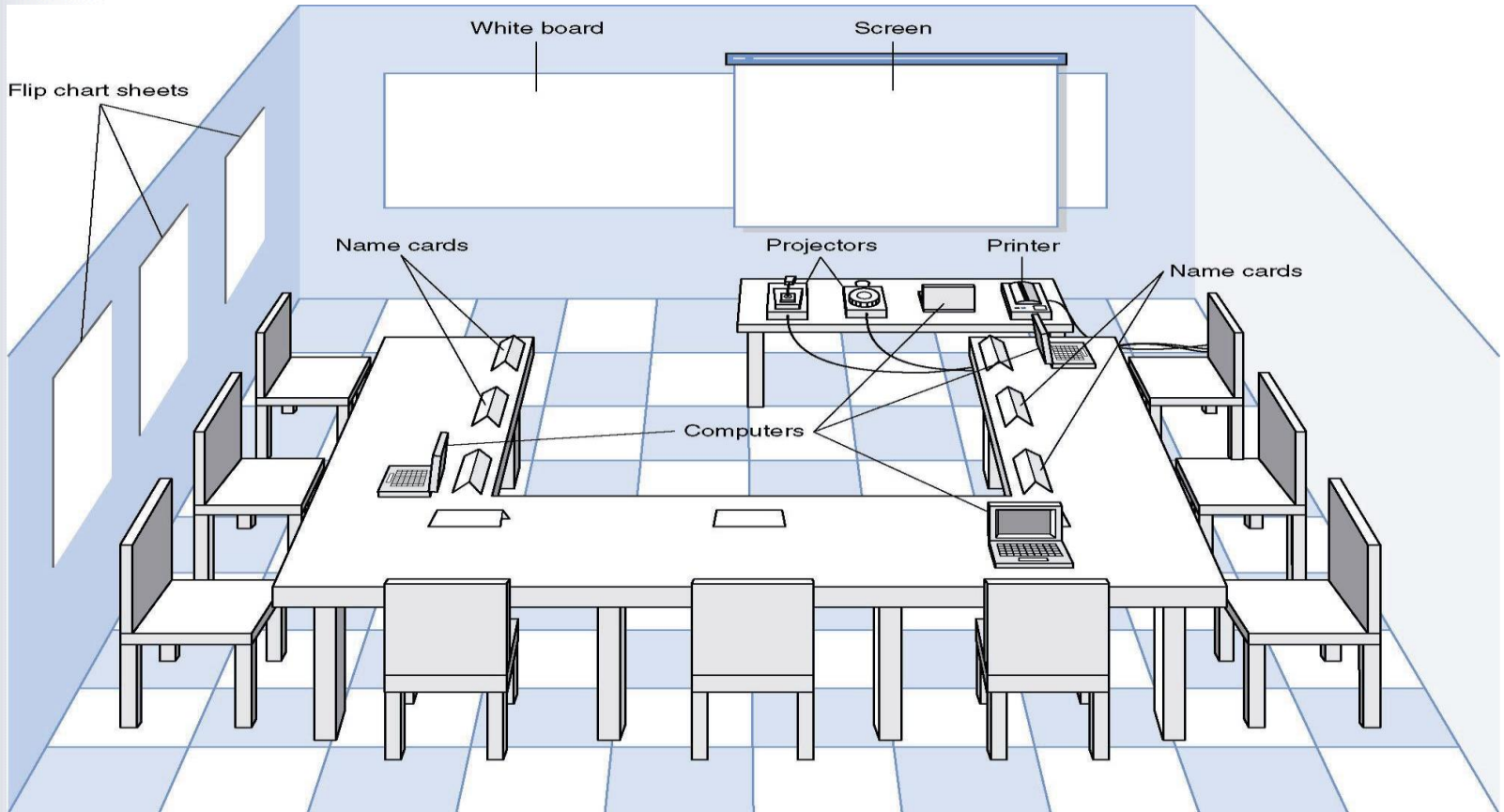
The JAD Session

- Tend to last 5 to 10 days over a three week period
- Prepare questions as with interviews
- Formal agenda and groundrules
- Facilitator activities
  - Keep session on track
  - Help with technical terms and jargon
  - Record group input
  - Help resolve issues
- Post-session follow-up

JAD Sessions -- Five Basic Steps

1. Selecting participants
2. Designing the JAD Session
3. Preparing for the JAD Session
4. Conducting the JAD Session
5. Post-JAD follow-up

Managing Problems in JAD Sessions

- Reducing domination
- Encouraging non-contributors
- Side discussions
- Agenda merry-go-round
- Violent agreement
- Unresolved conflict
- True conflict
- Use humour

3. QUESTIONNAIRES

Questionnaire Steps

- Selecting participants
  - Using samples of the population
- Designing the questionnaire
  - Careful question selection
- Administering the questionnaire
  - Working to get good response rate
- Questionnaire follow-up
  - Send results to participants

Good Questionnaire Design

Begin with non-threatening and interesting questions

Group items into logically coherent sections

Do not put important items at the very end of the questionnaire

Do not crowd a page with too many items

Avoid abbreviations

Avoid biased or suggestive items or terms

Number questions to avoid confusion

Pretest the questionnaire to identify confusing questions

Provide anonymity to respondents

4. DOCUMENT ANALYSIS

Document Analysis

- Provides clues about existing "as-is" system
- Typical documents
  - Forms
  - Reports
  - Policy manuals
- Look for user additions to forms
- Look for unused form elements

5. OBSERVATION

Observation

- Checks validity of information gathered other ways
- Users/managers often don't remember everything they do !
- Behaviours change when people are watched !
- Careful not to ignore <u>periodic</u> activities
  - Weekly … Monthly … Annual !

Selecting the Appropriate Techniques

	Interviews	JAD	Questionnaires	Document Analysis	Observation
Type of Information	As-Is Improve. To-Be	As-Is Improve. To-Be	As-Is Improve.	As-Is	As-Is
Depth of Information	High	High	Medium	Low	Low
Breadth of Information	Low	Medium	High	High	Low
Integration of Info.	Low	High	Low	Low	Low
User Involvement	Medium	High	Low	Low	Low
Cost	Medium	Low-Medium	Low	Low	Low-Medium

Summary

- There are five major information gathering techniques that all systems analysts must be able to use: *Interviews, JAD, Questionnaires, Document Analysis, and Observation*.

- Systems analysts must also know how and when to use each as well as how to combine methods.