Essentials of Systems Analysis and Design
Sixth Edition

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Chapter 5
Determining System Requirements

Learning Objectives

- Describe options for designing and conducting interviews
- Discuss planning an interview to determine system requirements
- Explain advantages and disadvantages of observing workers and analyzing business documents to determine requirements

Learning Objectives (continued)

- Learn about Joint Application Design (JAD) and Prototyping
- Discuss appropriate methods to elicit system requests
- Explain Business Process Reengineering (BPR)
- Examine requirements determination for Internet applications

Performing Requirements Determination

- Gather information on what system should do from many sources
  - Users
  - Reports
  - Forms
  - Procedures

Performing Requirements Determination (continued)

- Characteristics for Gathering Requirements
  - Impertinence
    - Question everything
  - Impartiality
    - Find the best organizational solution
  - Relaxation of constraints
    - Assume anything is possible and eliminate the infeasible
  - Attention to detail
    - Every fact must fit with every other fact
  - Reframing
    - View the organization in new ways

Deliverables and Outcomes

- Types of Deliverables:
  - Information collected from users
  - Existing documents and files
  - Computer-based information
  - Understanding of organizational components
    - Business objective
    - Information needs
    - Rules of data processing
    - Key events

TABLE 5-1: Deliverables for Requirements Determination

Types of Deliverables	Specific Deliverables
Information collected from conversations with users	Interview transcripts Notes from observations Meeting notes
Existing documents and files	Business mission and strategy statement Sample business forms and reports and computer displays Procedure manuals Job descriptions Training manuals Flowcharts and documentation of existing systems Consultant reports
Computer-based information	Results from Joint Application Design sessions CASE repository contents and reports of existing systems Displays and reports from system prototypes

Traditional Methods for Determining Requirements

TABLE 5-2: Traditional Methods of Collecting System Requirements

Traditional Method	Activities Involved
Interviews with individuals	Interview individuals informed about the operation and issues of the current system and needs for systems in future organizational activities.
Observations of workers	Observe workers at selected times to see how data are handled and what information people need to do their jobs.
Business documents	Study business documents to discover reported issues, policies, rules, and directions as well as concrete examples of the use of data and information in the organization.

Traditional Methods for Determining Requirements (continued)

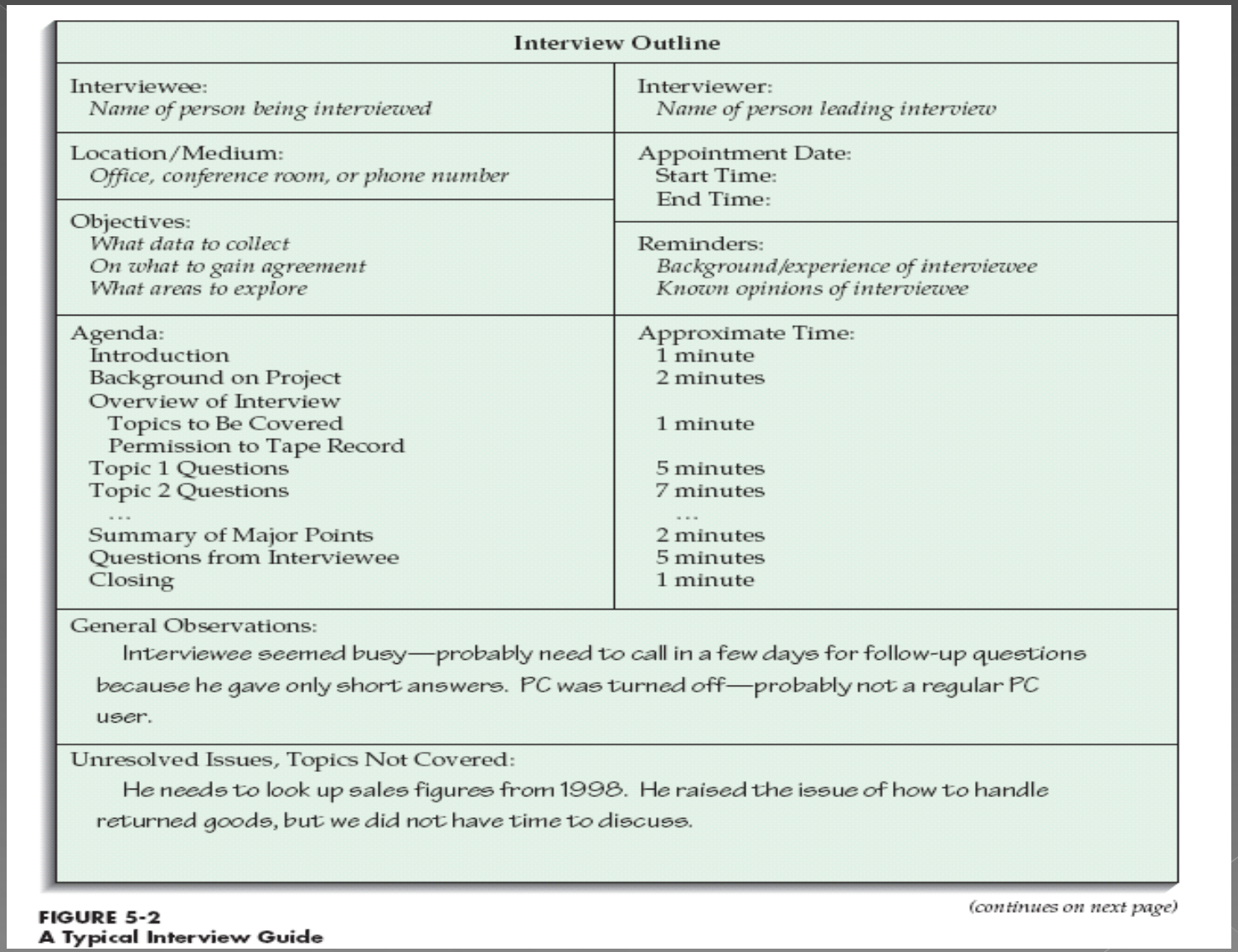
- Interviewing and Listening
  - Gather facts, opinions, and speculations
  - Observe body language and emotions
  - Guidelines
    - Plan the interview
      - Checklist
      - Appointment
    - Be neutral
    - Listen and take notes
    - Seek a diverse view

Traditional Methods for Determining Requirements (continued)

- Interviewing (Continued)
  - Interview Questions
    - Open-Ended
      - No pre-specified answers
      - Used to probe for unanticipated answers
    - Close-Ended
      - Respondent is asked to choose from a set of specified responses
      - Work well when the popular answers to questions are known
      - Do not require a long period of time, and can cover a greater number of topics

TABLE 5-3: Guidelines for Effective Interviewing

Guidelines	What Is Involved
Plan the interview	Prepare interviewee by making an appointment and explaining the purpose of the interview. Prepare a checklist, an agenda, and questions.
Be neutral	Avoid asking leading questions.
Listen and take notes	Give your undivided attention to the interviewee and take notes or tape-record the interview (if permission is granted).
Review notes	Review your notes within 48 hours of the meeting. If you discover follow-up questions or need additional information, contact the interviewee.
Seek diverse views	Interview a wide range of people, including potential users and managers.



Interview Outline

Interviewee: *Name of person being interviewed*	Interviewer: *Name of person leading interview*
Location/Medium: *Office, conference room, or phone number*	Appointment Date: Start Time: End Time:
Objectives: *What data to collect* *On what to gain agreement* *What areas to explore*	Reminders: *Background/experience of interviewee* *Known opinions of interviewee*
Agenda: Introduction Background on Project Overview of Interview Topics to Be Covered Permission to Tape Record Topic 1 Questions Topic 2 Questions ... Summary of Major Points Questions from Interviewee Closing	Approximate Time: 1 minute 2 minutes 1 minute 5 minutes 7 minutes ... 2 minutes 5 minutes 1 minute
General Observations: Interviewee seemed busy—probably need to call in a few days for follow-up questions because he gave only short answers. PC was turned off—probably not a regular PC user.	
Unresolved Issues, Topics Not Covered: He needs to look up sales figures from 1998. He raised the issue of how to handle returned goods, but we did not have time to discuss.	

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FIGURE 5-2
A Typical Interview Guide

Interviewee:	Date:
Questions:	Notes:
When to ask question, if conditional *Question: 1* Have you used the current sales tracking system? If so, how often? *If yes, go to Question 2*	*Answer* Yes, I ask for a report on my product line weekly. *Observations* Seemed anxious—may be overestimating usage frequency
Question: 2 What do you like least about this system?	*Answer* Sales are shown in units, not dollars. *Observations* System can show sales in dollars, but user does not know this.

FIGURE 5-2
(continued)

Traditional Methods for Determining Requirements (continued)

- Directly Observing Users
  - Serves as a good method to supplement interviews
  - Often difficult to obtain unbiased data
    - People often work differently when being observed

Analyzing Procedures and Other Documents

- Types of Information to Be Discovered:
  - Problems with existing system
  - Opportunity to meet new need
  - Organizational direction
  - Title and names of key individuals
  - Values of organization
  - Special information processing circumstances
  - Rules for processing data

TABLE 5-4: Comparison of Observation and Document Analysis

Characteristic	Observation	Document Analysis
Information richness	High (many channels)	Low (passive) and old
Time required	Can be extensive	Low to moderate
Expense	Can be high	Low to moderate
Chance for follow-up and probing	Good: Opportunity for probing and clarification questions during or after observation	Limited: Probing possible only if original author is available
Confidentiality	Observee is known to interviewer; observee may change behavior when observed	Depends on nature of document; does not change simply by being read
Involvement of subject	Interviewees' involvement committed dependent on whether they know they are being observed	None, no clear commitment
Potential audience	Limited numbers and limited time (snapshot) of each	Potentially biased by which documents were kept or because document not created for this purpose

Modern Methods for Determining Requirements

- Joint Application Design (JAD)
  - Brings together key users, managers, and systems analysts
  - Purpose: collect system requirements simultaneously from key people
  - Conducted off-site
- Prototyping, POC to yield MVP
  - Repetitive process
  - Rudimentary version of system is built
  - Replaces or augments SDLC
  - Goal: to develop concrete specifications for ultimate system

Joint Application Design (JAD)

- Participants
  - Session leader
  - Users
  - Managers
  - Sponsor
  - Systems analysts
  - Scribe
  - IS staff

Joint Application Design (JAD) (continued)

- End Result
  - Documentation detailing
    - Existing system
    - Features of a replacement system

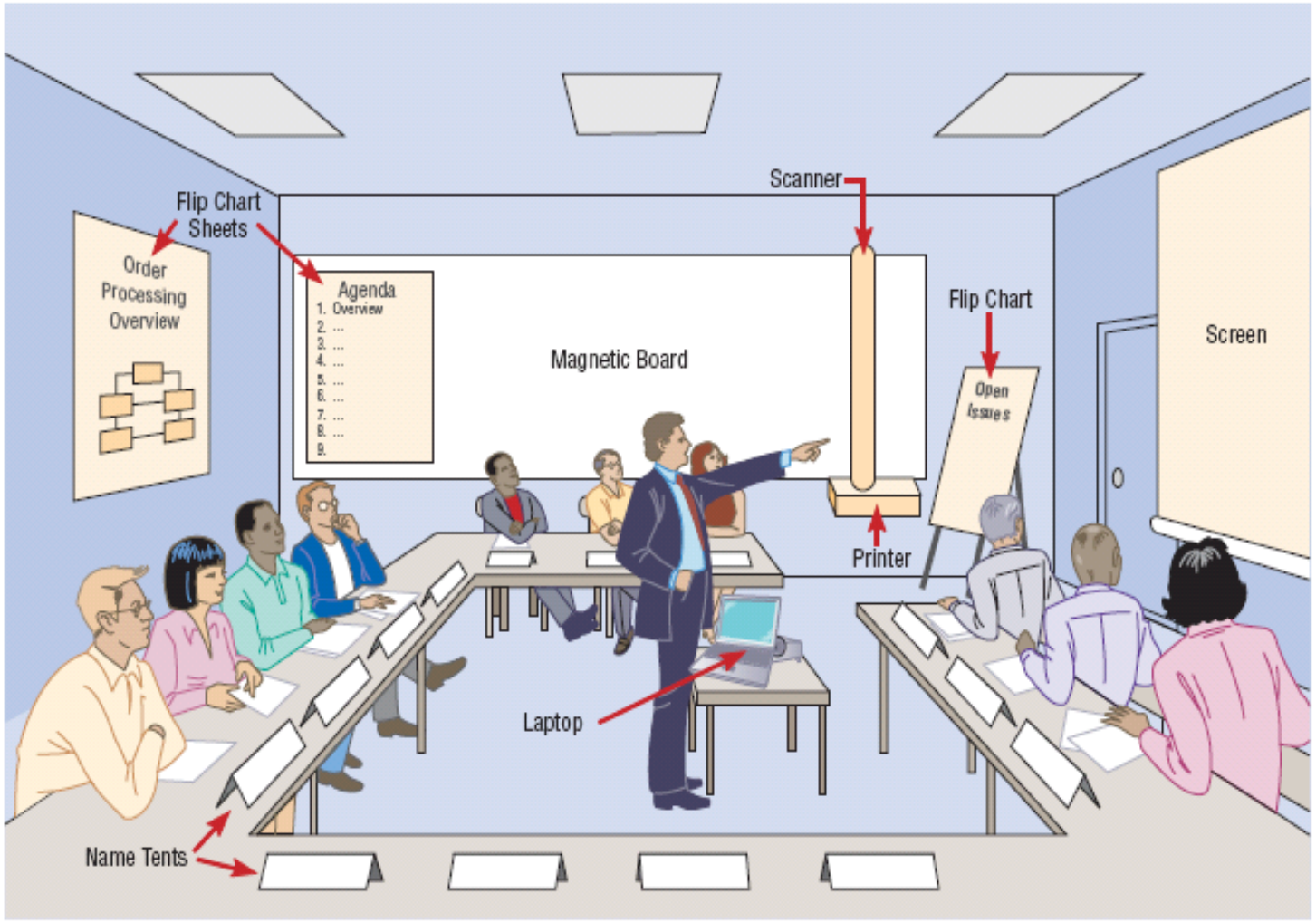

FIGURE 5-6
A Typical Room Layout for a JAD Session
Source: Adapted from Wood and Silver, 1989.

Prototyping

- User quickly converts requirements to working version of system
- Once the user sees requirements converted to system, will ask for modifications or will generate additional requests

Prototyping (continued)

- Most useful when:
  - User requests are not clear
  - Few users are involved in the system
  - Designs are complex and require concrete form to evaluate fully
  - History of communication problems between analysts and users
  - Tools are readily available to build prototype

Prototyping (continued)

- Drawbacks
  - Tendency to avoid formal documentation
  - Difficult to adapt to more general user audience
  - Sharing data with other systems is often not considered
  - Systems Development Life Cycle (SDLC) checks are often bypassed

Business Process Reengineering (BPR)

- Search for and implementation of radical change in business processes to achieve breakthrough improvements in products and services
- Goals
  - Reorganize complete flow of data in major sections of an organization
  - Eliminate unnecessary steps
  - Combine steps
  - Become more responsive to future change

Business Process Reengineering (BPR) (continued)

- Identification of processes to reengineer
  - Key business processes
    - Set of activities designed to produce specific output for a particular customer or market
    - Focused on customers and outcome
    - Same techniques are used as were used for requirements determination

Business Process Reengineering (BPR) (continued)

- Identify specific activities that can be improved through BPR
- Disruptive Technologies
  - Technologies that enable the breaking of long-held business rules that inhibit organizations from making radical business changes
  - See Table 5-5

TABLE 5-5: Long-Held Organizational Rules That Are Being Eliminated Through Disruptive Technologies

Rule	Disruptive Technology
Information can appear in only one place at a time.	Distributed databases allow the sharing of information.
Only experts can perform complex work.	Expert systems can aid nonexperts.
Businesses must choose between centralization and decentralization.	Advanced telecommunications networks can support dynamic organizational structures.
Managers must make all decisions.	Decision support tools can aid nonmanagers.
Field personnel need offices where they can receive, store, retrieve, and transmit information.	Wireless data communication and portable computers provide a "virtual" office for workers.
The best contact with a potential buyer is personal contact.	Interactive communication technologies allow complex messaging capabilities.
You have to find out where things are.	Automatic identification and tracking technology know where things are.
Plans get revised periodically.	High-performance computing can provide real-time updating.

Summary

- Interviews
  - Open-ended and close-ended questions
  - Preparation is key
- Other means of gathering requirements are:
  - Observing workers
  - Analyzing business documents

Summary (continued)

- Joint Application Design (JAD)
- Prototyping
- Business Process Reengineering (BPR)
  - Disruptive technologies