Requirements Determination

Chapter 3

Key Definitions

- [✓] The *As-Is system* is the current system and may or may not be computerized
- [✓] The *To-Be system* is the new system that is based on updated requirements
- [✓] The *System Proposal* is the key deliverable from the Analysis Phase

Key Ideas

- [✓] The goal of the analysis phase is to truly understand the requirements of the new system and develop a system that addresses them -- or decide a new system isn't needed.
- [✓] The System Proposal is presented to the approval committee via a system *walk-through*.
- [✓] Systems analysis incorporates initial systems design.
- [✓] Requirements determination is the single most critical step of the entire SDLC.

What is a Requirement?

- [✓] A statement of what the system must do
- [✓] A statement of characteristics the system must have
- [✓] Focus is on business user needs during analysis phase
- [✓] Requirements will change over time as project moves from analysis to design to implementation

Requirement Types

- [✓] Functional Requirements
  - A process the system has to perform
  - Information the system must contain
- [✓] Nonfunctional Requirements
  - Behavioral properties the system must have
    - Operational
    - Performance
    - Security
    - Cultural and political

Documenting Requirements

- [✓] Requirements definition report
  - Text document listing requirements in outline form
  - Priorities may be included
- [✓] Key purpose is to define the **project scope:** what <u>is</u> and <u>is not</u> to be included.

Determining Requirements

- ☑ Participation by business users is essential
- ☑ Three techniques help users discover their needs for the new system:
    - ➤ Business Process Automation (BPA)
    - ➤ Business Process Improvement (BPI)
    - ➤ Business Process Reengineering (BPR)
    - ➤

Basic Process of Analysis (Determining Requirements)

- ☑ Understand the "As-Is" system
- ☑ Identify improvement opportunities
- ☑ Develop the "To-Be" system concept
- ☑ Techniques vary in amount of change
    - ➤ BPA – small change
    - ➤ BPI – moderate change
    - ➤ BPR – significant change
- ☑ Additional information gathering techniques are needed as well

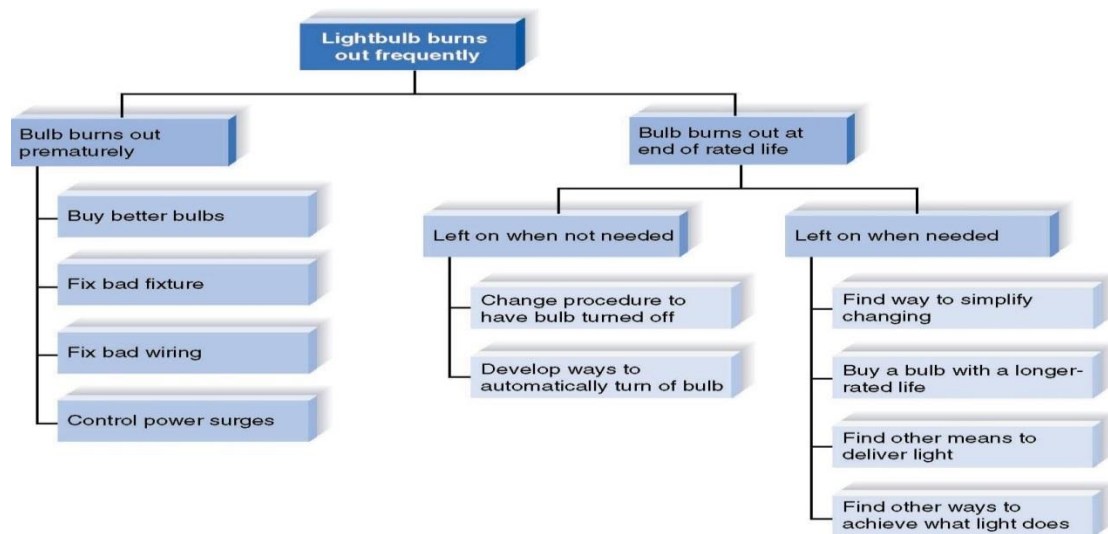## REQUIREMENTS ANALYSIS TECHNIQUES

Business Process Automation
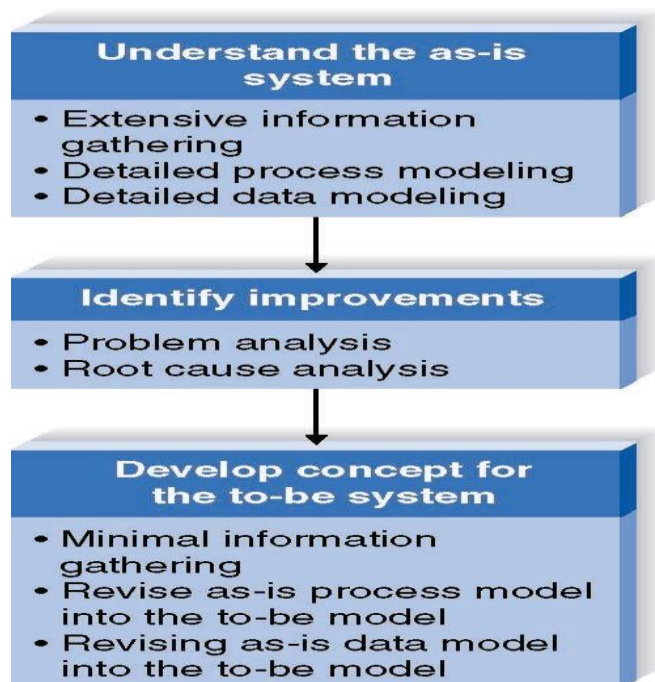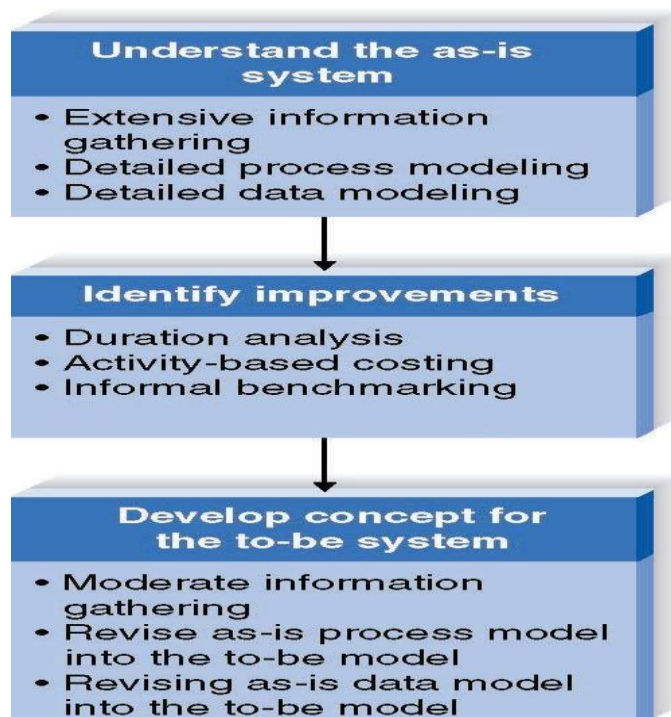

Goal:
Efficiency for users.

Identifying Improvements in As-Is Systems

- ☑ **Problem Analysis**
  - ➢ Ask users to identify problems and solutions
  - ➢ Improvements tend to be small and incremental
  - ➢ Rarely finds improvements with significant business value
- ☑ **Root Cause Analysis**
  - ➢ Challenge assumptions about why problem exists
  - ➢ Trace symptoms to their causes to discover the "real" problem

Root Cause Analysis Example

Lightbulb burns out frequently

Bulb burns out prematurely
- Buy better bulbs
- Fix bad fixture
- Fix bad wiring
- Control power surges

Bulb burns out at end of rated life

Left on when not needed
- Change procedure to have bulb turned off
- Develop ways to automatically turn of bulb

Left on when needed
- Find way to simplify changing
- Buy a bulb with a longer-rated life
- Find other means to deliver light
- Find other ways to achieve what light does

Business Process Improvement

Understand the as-is system
- Extensive information gathering
- Detailed process modeling
- Detailed data modeling

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Identify improvements
- Duration analysis
- Activity-based costing
- Informal benchmarking

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Develop concept for the to-be system
- Moderate information gathering
- Revise as-is process model into the to-be model
- Revising as-is data model into the to-be model

Goal:
Efficiency and effectiveness for users

Duration Analysis

- ☑ Calculate time needed for each process step
- ☑ Calculate time needed for overall process
- ☑ Compare the two – a large difference indicates a badly fragmented process
- ☑ Potential solutions:
    - ➧ Process integration – change the process to use fewer people, each with broader responsibilities
    - ➧ Parallelization – change the process so that individual step are performed simultaneously

Activity-Based Costing

- ☑ Calculate cost of each process step
- ☑ Consider both direct and indirect costs
- ☑ Identify most costly steps and focus improvement efforts on them

Benchmarking

- ☑ Studying how other organizations perform the same business process
- ☑ Informal benchmarking

  - ➧ Common for customer-facing processes
  - ➧ Interact with other business' processes as if you are a customer

Business Process Reengineering (BRP)
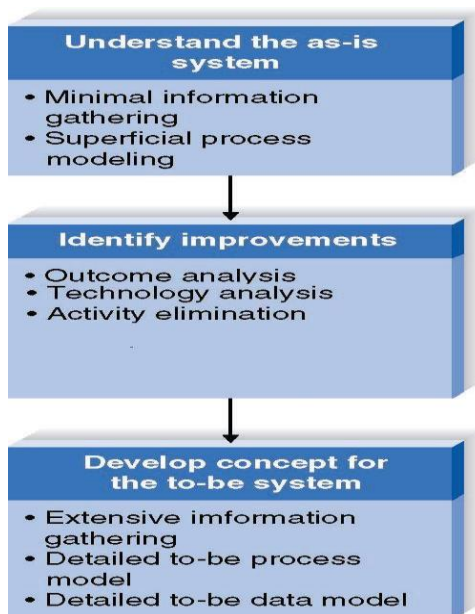
Goal

Radical redesign of business processes

Outcome Analysis

- Consider desirable outcomes from customers' perspective
- Consider what the organization *could* enable the customer to do

Technology Analysis

- Analysts list important and interesting technologies
- Managers list important and interesting technologies
- The group identifies how each might be applied to the business and how the business might benefit

Activity Elimination

- Identify what would happen if each organizational activity were eliminated
- Use "force-fit" to test all possibilities

Comparing Analysis Techniques

★ Potential business value
- Project cost
- Breadth of analysis
- Risk

Project Characteristics

	Business Process Automation	Business Process Improvement	Business Process Reengineering
Potential business value	Low-moderate	Moderate	High
Project cost	Low	Low-moderate	High
Breadth of analysis	Narrow	Narrow-moderate	Very broad
Risk	Low-moderate	Low-moderate	Very high

REQUIREMENTS-GATHERING TECHNIQUES

Interviews

- Most commonly used technique
- Basic steps:
    - Selecting Interviewees
    - Designing Interview Questions
    - Preparing for the Interview
    - Conducting the Interview
    - Post-Interview Follow-up

Selecting Interviewees

- Based on information needs
- Best to get different perspectives
    - Managers
    - Users
   - Ideally, all key stakeholders
- Keep organizational politics in mind

Three Types of Questions

Types of Questions	Examples
Closed-Ended Questions	• How many telephone orders are received per day? • How do customers place orders? • What information is missing from the monthly sales report?
Open-Ended Questions	• What do you think about the way invoices are currently processed? • What are some of the problems you face on a daily basis? • What are some of the improvements you would like to see in the way invoices are processed?
Probing Questions	• Why? • Can you give me an example? • Can you explain that in a bit more detail?

Designing Interview Questions

- Unstructured interview useful early in information gathering
    - Goal is broad, roughly defined information
- Structured interview useful later in process
    - Goal is very specific information

Top-Down and Bottom-up Questioning Strategies
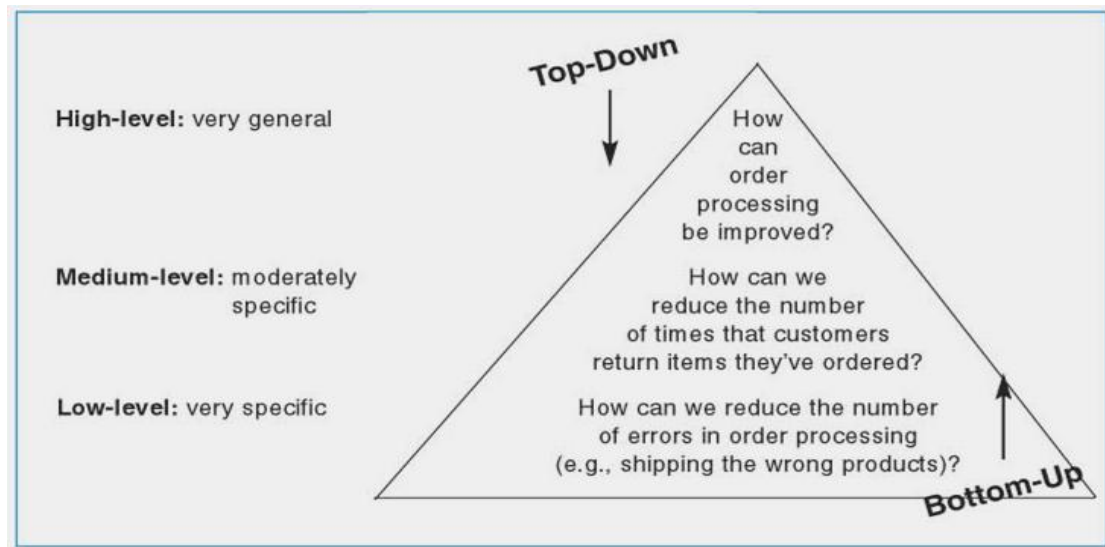
Preparing for the Interview

- ☑ Prepare general interview plan
  - ➤ List of question
  - ➤ Anticipated answers and follow-ups
- ☑ Confirm areas of knowledge
- ☑ Set priorities in case of time shortage
- ☑ Prepare the interviewee
  - ➤ Schedule
  - ➤ Inform of reason for interview
  - ➤ Inform 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

Post-Interview Follow-Up

- ☑ Prepare interview notes
- ☑ Prepare interview report
- ☑ Have interviewee review and confirm interview report
- ☑ Look for gaps and new questions

Joint Application Development (JAD)

- A structured group process focused on determining requirements
- Involves project team, users, and management working together
- May reduce scope creep by 50%
- Very useful technique

JAD Participants

- **Facilitator**
    - Trained in JAD techniques
    - Sets agenda and guides group processes
- **Scribe(s)**
    - Record content of JAD sessions
- **Users and managers from business area with broad and detailed knowledge**

Preparing for the JAD Sessions

- Time commitment – ½ day to several weeks
- Strong management support is needed to release key participants from their usual responsibilities
- Careful planning is essential
- e-JAD can help alleviate some problems inherent with groups

Conducting the JAD Session

- Formal agenda and ground rules
- Top-down structure most successful
- Facilitator activities
    - Keep session on track
    - Help with technical terms and jargon
    - Record group input
    - Stay neutral, but help resolve issues
- Post-session follow-up report

Post JAD Follow-up

- Post session report is prepared and circulated among session attendees
- The report should be completed approximately a week to two after the JAD session

Questionnaires

- A set of written questions, often sent to a large number of people
- May be paper-based or electronic
- Select participants using samples of the population
- Design the questions for clarity and ease of analysis
- Administer the questionnaire and take steps to get a good response rate
- Questionnaire follow-up report

Good Questionnaire Design

- Begin with nonthreatening 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.

Document Analysis

- ☑ Study of existing material describing the current system
- ☑ Forms, reports, policy manuals, organization charts describe the **formal system**
- ☑ Look for the **informal system** in user additions to forms/report and unused form/report elements
- ☑ User changes to existing forms/reports or non-use of existing forms/reports suggest the system needs modification

Observation

- ☑ Watch processes being performed
- ☑ Users/managers often don't accurately recall everything they do
- ☑ Checks validity of information gathered other ways
- ☑ Be aware that behaviors change when people are watched
- ☑ Be unobtrusive
- ☑ Identify peak and lull periods

Selecting the Appropriate Requirements-Gathering Techniques

- ☑ Type of information
- ☑ Depth of information
- ☑ Breadth of information
- ☑ Integration of information
- ☑ User involvement
- ☑ Cost
- ☑ Combining techniques

Comparison of Requirements-Gathering Techniques

	Interviews	Joint Application Design	Questionnaires	Document Analysis	Observation
Type of information	As-is, improvements, to-be	As-is, improvements, to-be	As-is, improvements	As-is	As-is
Depth of information	High	High	Medium	Low	Low
Breadth of information	Low	Medium	High	High	Low
Integration of information	Low	High	Low	Low	Low
User involvement	Medium	High	Low	Low	Low
Cost	Medium	Low–Medium	Low	Low	Low–Medium

Summary

☑ The analysis process focuses on capturing the business requirements for the system

☑ Functional and non-functional business requirements tell *what* the system must do

☑ Three main requirements analysis techniques are BPA, BPI, and BPR

☑ These techniques vary in potential business value, but also in potential cost and risk

☑ There are five major requirements-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