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 is and is not 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

Business Process Automation

- **Goal:** Efficiency for users

  - **Understand the “As-Is” process**
    - Existing information gathering
    - Detailed process modeling
  - **Identify non-conformance**
    - Problems identified
    - Process improvement analysis
  - **Develop concept for the “To-Be” system**
    - Minimal information gathering
    - Detailed reengineering process model
    - Drawn directly into the “To-Be” model

- Additional information gathering techniques are needed as well.
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

Business Process Improvement

- **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

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

Outcome Analysis
Consider desirable outcomes from customers’ perspective
Consider what the organization could enable the customer to do

Your Turn
How do you know whether to use business process automation, business process improvement, or business process reengineering?
Provide two examples.

Comparing Analysis Techniques
Potential business value
Project cost
Breadth of analysis
Risk
Project Characteristics

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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

- 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**

- High-level: very general
- Medium-level: moderately specific
- Low-level: very specific

**Preparing for the Interview**

- 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
  - Schedule
  - Inform of reason for interview
  - Inform of areas of discussion

**Preparing for the Interview**

- 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

- Postsession 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.
- Preface 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**

<table>
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<tr>
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<th>Interviews</th>
<th>Joint Application Design</th>
<th>Questionnaires</th>
<th>Document Analysis</th>
<th>Observation</th>
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**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

**Summary, continued**

- 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.