

LECTURE 3

REQUIREMENTS GATHERING

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

1. Requirements Determination

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
  o A process the system has to perform
  o Information the system must contain
• Nonfunctional Requirements
  o Behavioral properties the system must have
    • Operational
    • Performance
    • Security
    • Cultural and political

Determining Requirements
• Participation by business users is essential
• Three techniques help users discover their needs for the new system:
  o Business Process Automation (BPA)
  o Business Process Improvement (BPI)
  o Business Process Reengineering (BPR)

Basic Process of Analysis
• Understand the “As-Is” system
• Identify improvement opportunities
• Develop the “To-Be” system concept
• Techniques vary in amount of change
  o BPA – small change
  o BPI – moderate change
  o BPR – significant change
• Additional information gathering techniques are needed as well

2. Requirements Analysis Techniques

Business Process Automation
Identifying Improvements in As-Is Systems
• Problem Analysis
  o Ask users to identify problems and solutions
  o Improvements tend to be small and incremental
  o Rarely finds improvements with significant business value
• Root Cause Analysis
  o Challenge assumptions about why problem exists
Trace symptoms to their causes to discover the “real” problem

**Business Process Improvement**

**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 (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
- 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
- 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

**Business Process Reengineering Steps**

**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
Selecting an Analysis Technique

<table>
<thead>
<tr>
<th>Business Process Automation</th>
<th>Potential Business Value</th>
<th>Project Cost</th>
<th>Breadth of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>Low-Moderate</td>
<td>Low</td>
<td>Narrow</td>
</tr>
<tr>
<td>Process Improvement</td>
<td>Moderate</td>
<td>Low-Moderate</td>
<td>Narrow-Moderate</td>
</tr>
<tr>
<td>Reengineering</td>
<td>High</td>
<td>High</td>
<td>Very Broad</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk</th>
<th>Low-Moderate</th>
<th>Low-Moderate</th>
<th>Very High</th>
</tr>
</thead>
</table>

2. Requirements Gathering Techniques

Requirements Gathering

- Characteristics for gathering requirements
  - Impertinence
    - Question everything
  - Impartiality
    - Find the best organizational solution
  - Relaxation of constraints
  - Attention to detail
  - Reframing
    - View the organization in new ways

Techniques

- Interviews
  - Open-ended and close-ended questions
  - Preparation is key
- Questionnaires
  - Must be carefully designed
  - Can contain close-ended as well as open-ended questions
- Other means of gather requirements
  - Observing workers
  - Analyzing business documents
- Joint Application Design (JAD)
- Prototyping

Interviews

- Gather facts, opinions and speculations
- Observe body language and emotions
- Guidelines
  - Plan
    - Checklist
    - Appointment
  - Be neutral
  - Listen
  - Seek a diverse view

Interviews Steps

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

### Designing Interview Questions
- **Types of Questions**
  - **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?

### Organizing 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

### Interview Preparation Steps
- **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**

### Conducting the Interview Practical Tips
- Take time to build rapport
- Pay attention
- Summarize key points
- Be succinct
- Be honest
- Watch body language

### Post-Interview Follow-Up
- Prepare interview notes
- Prepare interview report
- Have interviewee review and confirm interview report
- Look for gaps and new questions
3. JOINT APPLICATION DESIGN (JAD)

Joint Application Development
- 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

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

JAD Meeting Room

Managing Problems in JAD Sessions
- Reducing domination
- Encouraging non-contributors
- Side discussions
- Agenda merry-go-round
- Violent agreement
- Unresolved conflict
- True conflict
- Use humor

Questionnaires
- A set of written questions, often sent to a large number of people
• Mostly closed-ended questions
• 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

**Administering Questionnaires**

- Choosing respondents
  - Should be representative of all users
  - Types of samples
    - Convenient
    - Random sample
    - Purposeful sample
    - Stratified sample

**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

**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
- Types of information to be discovered:
  - Problems with existing system
  - Opportunity to meet new need
  - Organizational direction
  - Names of key individuals
  - Values of organization
  - Special information processing circumstances
  - Rules for processing data

**Observation**

- Watch processes being performed
- Serves as a good method to supplement interviews
- 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
  - Often difficult to obtain unbiased data
- Be unobtrusive
- Identify peak and lull periods
Selecting the Appropriate Techniques

<table>
<thead>
<tr>
<th></th>
<th>Interviews</th>
<th>JAD</th>
<th>Questionnaires</th>
<th>Document Analysis</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Information</strong></td>
<td>As-Is</td>
<td>As-Is</td>
<td>As-Is</td>
<td>As-Is</td>
<td>As-Is</td>
</tr>
<tr>
<td></td>
<td>Improve.</td>
<td>Improve.</td>
<td>Improve.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Depth of Information</strong></td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Breadth of Information</strong></td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Integration of Info.</strong></td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td><strong>User Involvement</strong></td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>Medium</td>
<td>Low-Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low-Medium</td>
</tr>
</tbody>
</table>

**Prototyping**

- Prototyping
  - Repetitive process
  - Rudimentary version of system is built
  - Replaces or augments SDLC
  - Goal: to develop concrete specifications for ultimate system
- 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
- Most useful when:
  - User requests are not clear
  - Few users are involved in the system
  - Designs are complex and require concrete form
  - History of communication problems between analysts and users
  - Tools are readily available to build prototype
- 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