I494 - Designing and Developing an Information System

Class 5

Functional vs. Non-functional
- Functional
  - Specific interactions, actions, outputs
- Non-functional
  - More general, operational, policy

<table>
<thead>
<tr>
<th>Functional Requirement</th>
<th>Nonfunctional Requirement</th>
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<tbody>
<tr>
<td>Operational</td>
<td>The physical and technical environments in which the system will operate</td>
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<tr>
<td></td>
<td>The system should be able to fit in a pocket or purse</td>
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<td></td>
<td>The system should be able to integrate with the existing inventory system</td>
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<td></td>
<td>The system should be available for use 24 hours per day, 365 days per year</td>
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<tr>
<td>Performance</td>
<td>The speed, capacity, and reliability of the system</td>
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<td></td>
<td>Any interaction between the user and the system should not exceed 2 seconds</td>
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<td></td>
<td>The system should receive updated inventory information every 15 minutes</td>
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<tr>
<td>Security</td>
<td>Who has authorized access to the system under what circumstances</td>
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<tr>
<td></td>
<td>Only direct managers can see personnel records of staff</td>
</tr>
<tr>
<td></td>
<td>Customers can only see their order history during business hours</td>
</tr>
<tr>
<td>Cultural and Political</td>
<td>Cultural, political factors and legal requirements that affect the system</td>
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<tr>
<td></td>
<td>The system should be able to distinguish between United States and European currency</td>
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<tr>
<td>Company Policy</td>
<td>Says that we only buy computers from Dell</td>
</tr>
</tbody>
</table>

Specific Tasks
- Understand the as-is
- Identify improvements
- Define the to-be

Requirements Risks
- Insufficient user involvement
- Creeping requirements
- Ambiguous requirements
- Gold-plating
- Minimality
- Inaccurate planning

Insufficient User Involvement
- How do we achieve sufficient involvement?
- How much is enough? Or too much?

Creeping Requirements
- Balance between flexibility and rigidity
- Needs do change, but when do we lock down?
- Remember the lifecycle
  - Will a change cascade?
  - Is it local?

Ambiguity
- If more than one person interprets something different
- Causes rework
- Examples….
Gold Plating
- Even if you could do something -- is it necessary?
- New functionality added late in the game

Minimality
- Not enough information to proceed
  - Ambiguity
  - …

Inaccurate Planning
- Quick responses to estimate requests
- May not consider other points-of-view
  - Sales
  - Marketing
  - Management

Elicitation
- elic-it \i-“lis-et\ vt
  1a: to draw forth or bring out (something latent or potential)
  1b: to derive (as a truth) by logical processes
  2: to call forth or draw out (a response or reaction)
- Investigative work – not just interviewing
Barriers to Success

What can go wrong?

Common Barriers

- Stakeholders cannot always express needs
- Difficulty in describing tasks performed
- Might be more difficult to describe why the tasks are performed
- Solution specification vs. need specification
- Experienced people may not be able to think outside the box
- Conflicting views from different people
- Resistance to change
- Hard to distinguish “nice to haves” from “must haves”
- Needs change over time

Elicitation Techniques

- Stakeholder analysis
- Interviewing
- Observation
- Task demonstration
- Survey
- Brainstorming
- Focus groups
- Prototyping
- Pilot implementations
Stakeholder Analysis

- Answer these questions:
  - Who are the stakeholders?
  - What are their goals
  - Why will they contribute to the process?

- From each, determine:
  - Risks, costs
  - Potential solutions
  - Another stakeholder

Interviewing

- Good for present-state information
- Discover opinions
- Group vs. individual
- Have a list of questions ready
  - Easier to consolidate results
  - When --- Why

Questions

- Closed-Ended
- Open-Ended
- Probing

Observation

- Sometimes people don’t realize when they do something
- Sometimes people can only demonstrate what they do
- Video?
Task Demonstration

- More specific and planned than interviews
- Usability experiments

Survey

- Open ended vs. closed questions
- What is the largest problem with …
- Rank the following issues …

Brainstorming

- Free-flowing stream of ideas
- No ridiculing or criticism
- Focus on goals
- Many unrealistic ideas do surface
- When should we prioritize?

Focus Group

- More structure than brainstorming
- Domain workshop
  - Task descriptions
  - Dataflow diagrams
  - Business processes
- Design workshop
  - Mockups
Prototyping
- Experiment to determine how things might work
  - Product-level
    - Features and tasks, but not interface
  - Design-level
    - Interface

Pilot Implementations
- Try it before purchasing
  - Full version
  - Scaled-down version
- At another site, or customer
  - Need to determine organizational similarities

How the Pros Work
- Requirements Meeting