

LECTURE 13

Software requirements Engineering

Management Aspects of Requirements Engineering

Instructor:

Dr. Natalia Chaudhry,

Assistant Professor, PUCIT, University of the Punjab, Lahore.

Readings


Chapter 8

Management Aspects of Requirements Engineering

Requirements Engineering, Elizabeth Hull, Ken Jackson and Jeremy Dick. 3rd Ed, Springer-Verlag London Limited, 2011..pdf

Requirements Management Problems

- The first problem is that very few people have had significant experience of managing requirements.
- This is mainly because very few organizations have a defined requirements management process that is followed across the organization.
- As a result, people faced with a project that must address requirements, have very little experience to draw on.
- This makes estimation very difficult, because one of the main ingredients of the production of good estimates is extensive relevant experience

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- The second problem is that many people do not properly distinguish between user or stakeholder requirements and system requirements.
 - Further, they often do not distinguish between system requirements and design specifications.
 - In other words, they go straight for a solution rather than defining a solution-independent set of requirements.

- The third main problem is that the way in which requirements are managed will depend upon the type of organization in which the work is being done.
- There are three main types of organization:
 - **Acquisition organizations** that purchase systems and then use them to provide an operational capability. These organizations are mainly concerned with creating and managing stakeholder requirements, which subsequently are used as the basis for acceptance of the delivered system.
 - **Supplier organizations** that respond to acquisition requests from acquisition organizations or higher level supplier organizations. These organizations receive input requirements and develop system requirements (and subsequently a design that is manufactured) in response to them.
 - **Product companies** that develop and sell products. These types of organizations encompass both acquisition and supply, but they tend to have a different relationship between the parts of the company that perform these roles compared with the standard acquisition and supplier relationship

Imagine a company named SnackCo that operates in the food industry.

- **SnackCo Acquisitions** focuses on acquiring smaller snack companies with unique products or market potential. For example, they acquire CrunchyBites, a startup known for its innovative protein-packed snack bars.
- **SnackCo Ingredients** manufactures and supplies various ingredients used in snack production. For instance, they produce high-quality nuts, dried fruits, and flavorings that are essential for making snack products.
- **SnackCo Snacks** is responsible for developing and marketing a range of snack products under the SnackCo brand. Leveraging the acquired recipes and ingredients from CrunchyBites and SnackCo Ingredients, they create a new line of protein-rich snack bars using CrunchyBites' formulas and high-quality ingredients from SnackCo Ingredients. These snack bars are then distributed to retailers and sold directly to consumers through various channels, including supermarkets, convenience stores, and online platforms.

- The fourth problem that makes the management of requirements more difficult than some other management activities is that it is difficult to monitor progress when requirements are being generated. One difficult issue is to know whether the requirements set is complete – in order to decide whether the activity should stop.
- The final problem is the problem of changes.
- Requirements management should be the primary focus for change management. Any proposed change will usually relate to one or more requirements



Summary of Requirement Management Problems

- planning;
- monitoring progress;
- controlling changes.



Steps in Managing Requirements in an Acquisition Organization

Stakeholder Identification and Analysis:

Identify all relevant stakeholders involved in the acquisition process, including senior management, end-users, procurement officers, and other key personnel. Analyze the needs, objectives, and priorities of each stakeholder group to understand their requirements and expectations.

Requirement Elicitation:

Gather requirements through various techniques such as interviews, surveys, workshops, and documentation review.

Engage with stakeholders to capture their needs, preferences, constraints, and any specific criteria they have for the acquisition.

Requirement Documentation:

Document requirements in a clear, concise, and structured manner using standardized templates and terminology.

Include information such as functional and non-functional requirements, acceptance criteria, dependencies, and constraints.

Requirement Analysis and Prioritization:

Analyze the collected requirements to identify dependencies, conflicts, and gaps. Prioritize requirements based on their importance to the organization's mission, strategic objectives, and impact on operational capabilities.

Requirement Traceability:

Establish traceability between requirements and higher-level objectives, strategic goals, and business needs.

Ensure that each requirement is linked back to the specific stakeholder need or organizational goal it addresses.



Requirement Validation:

Validate requirements with stakeholders to ensure that they accurately capture their needs and expectations.

Seek feedback and clarification from stakeholders to verify the correctness, completeness, and feasibility of requirements.

Change Management:

Implement a robust change management process to manage updates and modifications to requirements throughout the acquisition lifecycle.

Evaluate proposed changes for their impact on cost, schedule, performance, and stakeholder satisfaction.



Communication and Collaboration:

Establish clear channels of communication and collaboration with stakeholders to ensure alignment and transparency throughout the requirements management process.

Foster a collaborative environment where stakeholders can provide input, feedback, and insights into the requirements.

Requirement Verification:


Verify that the final solution or product meets the specified requirements through testing, inspection, and validation.

Conduct formal reviews and inspections to confirm that all requirements have been satisfied and the desired outcomes have been achieved.

Continuous Improvement:

Continuously monitor and evaluate the requirements management process to identify areas for improvement.

Solicit feedback from stakeholders and capture lessons learned from previous acquisitions to enhance future practices and outcomes.



steps in Managing Requirements in an supplier Organization

Understanding Client Needs:

Begin by thoroughly understanding the requirements and expectations of the acquiring organization or client.

Clarify any ambiguities or uncertainties regarding the requirements through open communication and discussion with the client.

Requirement Analysis:

Analyze the client's requirements to identify the scope, objectives, constraints, and specific criteria that need to be addressed.

Break down the requirements into manageable components and prioritize them based on their importance and impact on the project.

Requirement Documentation:

Document the client's requirements in a clear, detailed, and structured manner using standardized templates and terminology.

Ensure that the requirements are accurately captured and documented to serve as a basis for development and delivery.

Alignment with Capabilities:

Assess the supplier organization's capabilities, resources, and expertise to determine its ability to meet the client's requirements.

Identify any gaps or areas where additional resources or skills may be needed to fulfill the requirements.

Proposal Development:

Develop a comprehensive proposal outlining how the supplier organization plans to address the client's requirements.

Clearly articulate the proposed solution, including the approach, methodology, timeline, deliverables, and pricing.

Client Collaboration:

Collaborate closely with the client throughout the requirements management process to ensure alignment and mutual understanding.

Seek feedback and validation from the client to confirm that the proposed solution meets their needs and expectations.

Requirement Validation:

Validate the proposed solution with the client to ensure that it accurately reflects their requirements and preferences.

Address any concerns or discrepancies raised by the client through iterative refinement and adjustment of the proposal.

Contract Negotiation:

Negotiate contractual agreements with the client that clearly define the requirements, deliverables, timelines, pricing, and terms of engagement.

Ensure that the contract reflects the mutual understanding and agreement reached between the supplier organization and the client.

Implementation and Delivery:

Implement the proposed solution in accordance with the agreed-upon requirements, schedule, and quality standards.


Monitor progress closely and address any issues or challenges that arise during implementation to ensure successful delivery.



Continuous Improvement:

Continuously evaluate and improve the requirements management process based on feedback from clients, lessons learned from previous projects, and industry best practices.

Seek opportunities for innovation and optimization to enhance the supplier organization's ability to meet and exceed client expectations.



steps in Managing Requirements in an Product Organization

Identify Stakeholders: Identify all stakeholders involved in the product development process, including users, customers, product managers, designers, developers, testers, and other relevant parties.

Understand User Needs: Conduct user research to understand the needs, preferences, and pain points of the target audience. Use techniques such as interviews, surveys, and usability testing to gather insights.

Define Product Vision and Goals: Establish a clear product vision and define specific goals and objectives that the product aims to achieve. Ensure alignment with the needs of the target users and the overall business strategy.

Elicit Requirements: Gather requirements from stakeholders through various methods such as interviews, workshops, focus groups, and observation. Document requirements in a structured format, including functional and non-functional aspects.

Prioritize Requirements: Prioritize requirements based on their importance, urgency, and impact on the product's success. Use techniques such as MoSCoW prioritization or weighted scoring to rank requirements.

Create User Stories or Use Cases: Translate requirements into user stories or use cases that describe specific user interactions and scenarios. Ensure that each user story captures a valuable piece of functionality or a user need.

Document Requirements: Document requirements in a central repository or requirements management tool. Include relevant details such as acceptance criteria, dependencies, constraints, and rationale behind each requirement.

Validate Requirements: Validate requirements with stakeholders to ensure that they accurately represent their needs and expectations. Use techniques such as prototyping, user feedback sessions, and reviews to verify requirements.

Iterate and Refine: Continuously iterate and refine requirements based on feedback from stakeholders, changes in market conditions, and evolving user needs. Maintain flexibility to adapt to new insights and requirements throughout the product lifecycle.

Communicate and Collaborate: Foster open communication and collaboration among cross-functional teams involved in product development. Ensure that all stakeholders have visibility into the requirements and can provide input and feedback as needed.

Manage Changes: Implement a change management process to handle updates and modifications to requirements. Assess the impact of changes on the product scope, schedule, and budget, and communicate any adjustments to stakeholders.

Track and Trace Requirements: Establish traceability between requirements and other artifacts such as design documents, test cases, and user documentation. Ensure that changes to requirements are tracked and reflected across related artifacts.

Validate Implemented Features: Validate implemented features against the defined requirements to ensure that they meet user needs and expectations. Conduct thorough testing and validation to identify and address any discrepancies or defects.

Review and Retrospect: Conduct regular reviews and retrospectives to evaluate the effectiveness of the requirements management process. Identify lessons learned and areas for improvement to enhance future product development efforts.