VALIDATION AND NEGOTIATION

Requirements validation

Validating requirements is an iterative process. It starts with your initial elicitation and continues throughout all following elicitations and changes. Unvalidated requirements are a source of misunderstandings and mistakes, with a direct influence on all future activities and artefacts.

Validation aspects include „content", „documentation", „agreement". Validating the *content*: have all relevant requirements been identified and documented sufficiently/adequately? Validatin the d*ocumentation*: are documentations acurate and coherent? Validating *„agreement"*: do all stakeholders agree on the relevant requirements / priorities and are all conflicts resolved? *Validation principles*: involving the right stakeholders / separate identification and correction of errors / validating from different perspectives (e. a tester's view, project manager, engineers, etc.) / continuous validation. Try some of these techniques and tools for validation: walk-through / prototypes / checklists / process simulation / etc.

Requirements negotiation

Conflicts of interest and priorities between stakeholders with regards to the relevancy of requirements are common. But to ensure the buy-in of all stakeholders to your initiative and the proposed solution options, these conflicts must be resolved. In some cases you might also find conflicts based on personal or cultural values and/or relationships. To resolve those conflicts, consider getting the support of your project manager or a peer. *The 4 steps of conflict management are:* 1. conflict identification => 2: analysis of reasons for conflict => 3: resolve conflict => 4: documentation (with whom, when and how was the conflict resolved).

Unresolved conflicts always jeopardise the acceptance due to lack of stakeholder buy-in and therefore the success of your initiative!

REQUIREMENTS MANAGEMENT

Attributes for requirements

Typical attributes for a requirement will include e.g. a numeric id, the respective epic and feature, source, responsible stakeholder, priority, status (confirmed, analysed, reviewed, cancelled etc.), dependencies, estimated costs, test case reference, category (functional, quality, business level, stakeholder level, solution level, transition requirements, etc.), version, etc.

Prioritising requirements

To systematically prioritise requirements, the relevant prioritisation criteria must be clarified with all stakeholders. Essential prioritisation criteria are: cost/value, implementation risks, volatility, importance/urgency, regulatory deadlines, etc. For prioritisation, all relevant stakeholders must be involved and reach consensus about which requirements will be prioritised. The usage of techniques such as e.g. MoSCoW, the Kano model or a QFD matrix will support you in providing a systematic "matter-of-fact" prioritisation approach.

Traceability of requirements

The traceability of requirements relates to: 1) *pre-specification artefacts* 2) *post-specification artefacts* 3) *interdependencies between requirements*. Pre-specification refers to the sources of a requirement. Post-specification refers to all activities which were based on the specification, e.g. test cases, solution design, code, release, etc.). Interdependencies support the identification of requirements which can not be implemented without the other requirements related to them.

Want to learn more about requirements engineering?
Reach out to us and find out what we can do for you!

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QUICK REFERENCE GUIDE REQUIREMENTS ENGINEERING

GETTING STARTED

Know the goals

Are the goals for the initiative clear to all stakeholders and are they documented in a "SMART" way? Insufficiently defined and/or the unprecise specification of goals will most likely lead to misinterpretations and misunderstandings about what should be achieved and therefore which requirements are relevant. Further, sound knowledge on how the initiative's goals are aligned to their respective management and strategic goals will enable you to argue the added value of the initiative when facing a lack of support from your stakeholders.
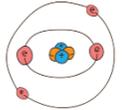
Know your scope

By using „systems thinking", identify the core aspect of your initiative and it's influencing aspects. Separate the two by using a context diagram to visualise the scope. The core aspect is your initiative and the product it is dedicated to. When drawing the context diagram, put this core aspect in the middle of your diagram. Anything that has a connection your product/initiative (or vice versa), is part of the context around it. "Items" within your context might be e.g. people/organisational units, satellite processes, satellite software systems, regulations, documentations etc.. Anything with an interface (technical) or a relation (human) with your product/initiative must be viewed as part of the context. Clearly separate the context from your product scope in your diagram.

Sources for requirements

The sources for requirements can now be identified from the product in scope as well as all the items in its context. Key sources are all involved and impacted stakeholders. Other sources include documentations (e.g. process documents), satellite systems, technical and organisational interfaces, business rules, etc..

STAKEHOLDER MANAGEMENT

Who are your stakeholders

Stakeholders are those people who influence your initiative by being either involved or impacted or both. In requirements engineering, this also includes core project roles such as the project manager, the developers, the testers, etc.. Besides the sponsor, stakeholders also include end-users, system operations units, management, SMEs etc.. Missing out on a stakeholder during requirements engineering can have significant negative impact on the initiative and the product being developed. If you miss out on a stakeholder, you also miss out on their requirements. Identifying the relevant stakeholders as early as possible is therefore essential. Use organisation charts, use cases, etc. to identify your stakeholders.

Stakeholder analysis

Stakeholder analysis supports your activities and communication during requirements engineering. It includes the analysis of interest, influence and attitude of your stakeholders towards your initiative. To document your stakeholder analysis, you can simply use a table and metrics (e.g. 1 low, 2 medium, 3 high):

Stakeholder	Interest	Influence	Attitude
Sponsor	3	3	positive
End-user	3	1	sceptical
Others	1	1	neutral
metric: 1-3, whereas: 1=low / 3=high			

A matrix helps to visualise the different interest and influencer's positions:
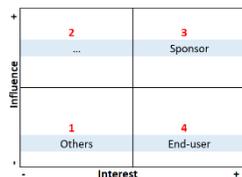
Q1: no need for special activities / Q2: ensure their positive attitude / Q3: work together closely / Q4: keep up the dialogue and stay in contact.

REQUIREMENTS ELICITATION

Requirements categories by Kano

The Kano model differentiates 3 satisfaction categories for requirements:
1. dissatisfiers, 2. satisfiers, 3. delighters.
Dissatisfiers are generally implicit requirements, which the stakeholder will not mention specifically (they expect us to know). However, if they are not fulfilled the stakeholder will be highly dissatisfied. *Satisfiers* are requirements the stakeholders generally communicate during elicitation (they don't expect us to know). If these are fulfilled, the stakeholder is satisfied. *Delighters* are requirements the stakeholders don't know about themselves. These are typically "nice surprises" which come with a solution. If these are recognised and offered to the stakeholder as an incentive, it will trigger extra delight for the product (however, if they are missing "dissatisfiers" the "delighters" will most likely not be sufficient).

Elicitation techniques

Not every elicitation technique works well with each of the 3 categories. *Recommended techniques for dissatisfiers*: observation, apprenticing, system archaeology, document study, brainstorming paradox. *Recommended techniques for satisfiers:* interviews (unstructured, structures), surveys, workshops. *Recommended techniques for delighters*: brainstorming, the 6-3-5 method, the 6-Thinking Hats (by Bono), analogies, personas (or any other creativity technique).

Influences

Human influences like stakeholder motivation, organisational culture, communication skills etc. are an essential part of elicitation activities and they also account for success or failure. It is therefore worth the while to analyse the current situation and choose the elicitation techniques wisely. Also, the locations of your stakeholders and their allocated time and schedule must be considered when planning elicitation.

DOCUMENTING REQUIREMENTS

Documentation options

Requirements can be simply written down in text or visualised with diagrams and models. Written descriptions are a critical source for misinterpretations and ambiguity. Models and diagrams can be used as a graphical description for requirements, instead or together with text descriptions to reduce complexity and facilitate reading and understanding.
Models used for documentation include: process diagrams, use case diagrams, data flow diagrams, decomposition models, class diagrams etc.. A model can be described as an abstract from reality which depict specific aspects of a product. Simply picture Google Earth vs. Google Maps to notice the difference. The example below represents a common use case diagram:
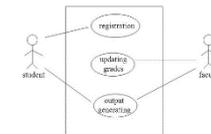
Text based documentation: writing has the advantage that it can generally be read and understood by anyone, where as models might need some explaining to people who are unfamiliar with the model. Due to the risk of ambiguity of written requirements, it is recommended to use short sentences and only describe one requirement per sentence. Using "templates" such as user story formats can support clarity and focus on the requirements being described. The example below represents a typical format of a user stories:

"As a <stakeholder role> I want to <requirement> so that <motivation>."

Timing and level of detail

The point in time as to when your documentation must show a specific level of detail depends on the approach of your initiative being either agile or plan driven. In any case though, the documentation must be sound, validated and sufficient for your stakeholders to agree on.