

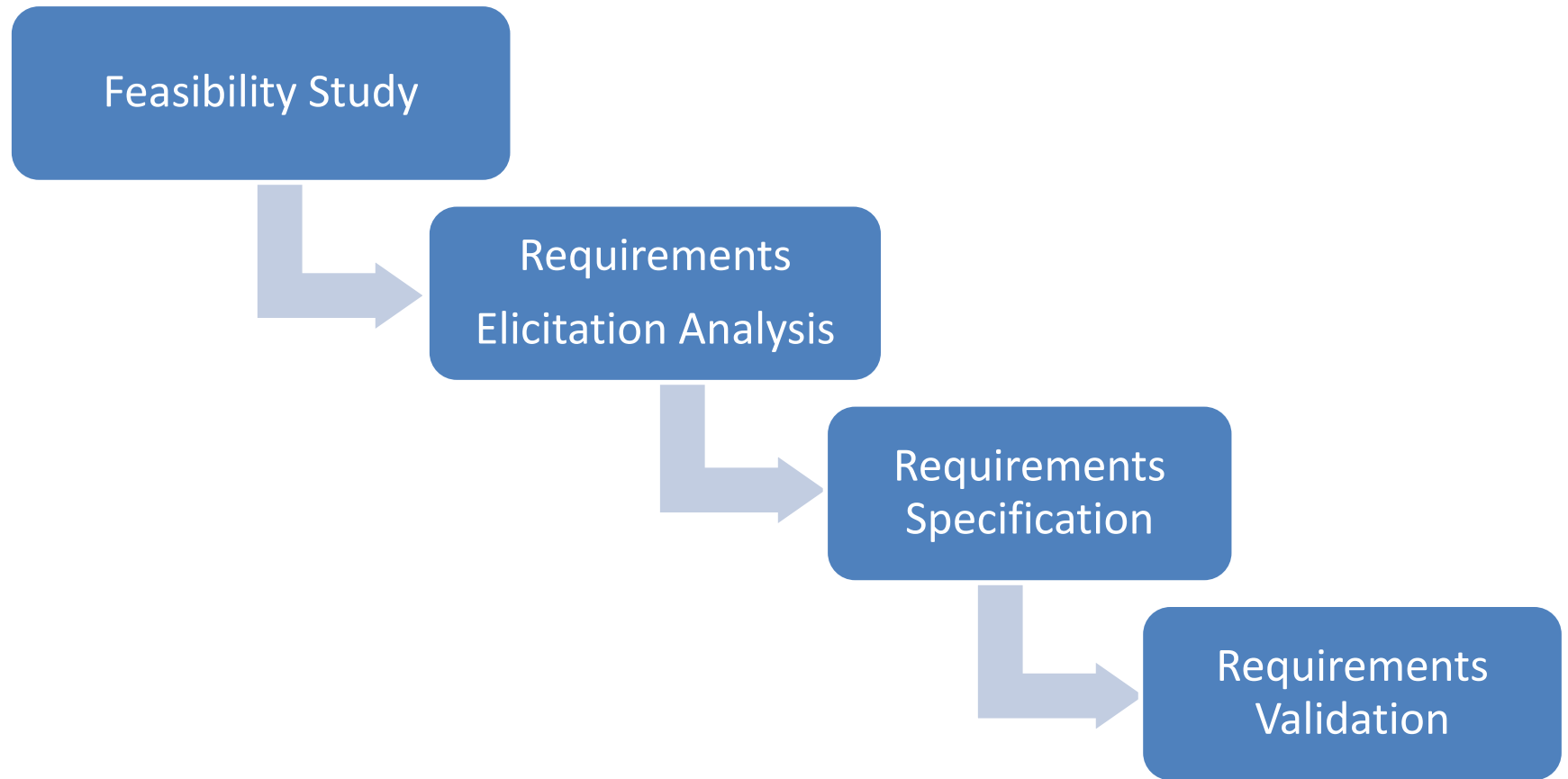
Software Engineering

Requirements Elicitation

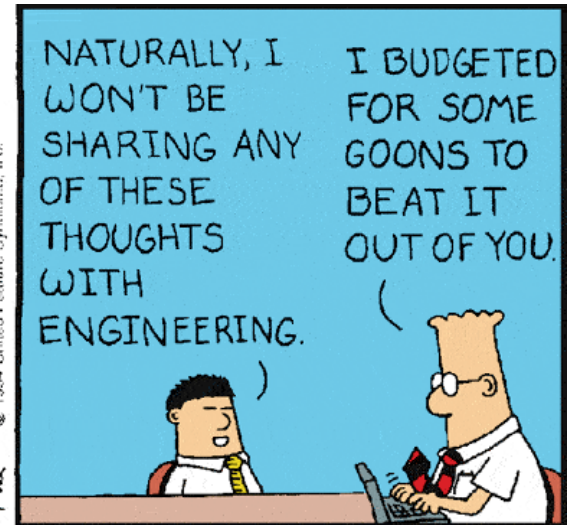
Requirements Elicitation

- The process of working with customers to learn about the application domain, the services that the system should provide, and the system's operational constraints.
- Involves all stakeholders:
 - end-users, managers, maintenance team, domain experts, trade unions, lawyers, etc...

The Requirements Engineering Process



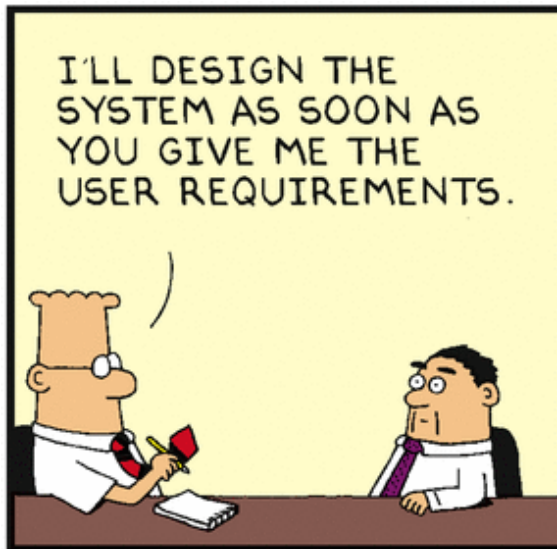
Requirements Elicitation



Why is Elicitation so hard?

- Stakeholders don't know what they want from a computer system except in the most general terms.
- Stakeholders express requirements with implicit knowledge of their domain.
- Different stakeholders have different requirements.
- Economic and business environment is dynamic during elicitation.

Stakeholders Must Work Too



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Interview the Stakeholder

- Make sure you have the right answer.
- Make sure this is the official answer.
 - If an answer is unclear, keep asking questions.
 - If somebody else tells you a different answer, politely ask for clarification.
- Find out what they are willing to pay for each function (helps in prioritization).
 - If unwilling/unable to place a \$ amount, ask how important it is for their daily work.

**These two
often conflict!**

Interview the Stakeholder

Try not to alienate the stakeholder:

Avoid "We thought you knew that." and "We always do it that way."

Hundreds of techniques

- First step: do your homework - research a problem before the interview.
- Be polite, but firm - keep asking until you feel you could deliver a working function.
- Follow up after writing requirements down.

Requirements elicitation techniques

Interviews

Establish rapport

To begin an interview, introduce yourself if the attendees don't already know you, review the agenda, remind attendees of the session objectives, and address any preliminary questions or concerns attendees have.

Elicitation techniques: Stay in scope

Stay in scope

- As with any elicitation session, keep the discussion focused on its objective.
- Even when you are talking with just one person or a small group, there's a chance the interview will go off topic.
- Prepare questions and straw man models ahead of time
- Prepare for interviews by drafting any materials you can beforehand, such as a list of questions to guide the conversation.
- Draft materials will give your users a starting point to think from. People can often critique content more easily than they can create it.

Elicitation techniques: Suggest Ideas

Suggest Ideas

- Rather than simply transcribing what customers say, be creative, proposes ideas and alternatives during elicitation.
- Sometimes users don't realize the capabilities developers can provide; they might get excited when you suggest functionality that will make the system especially valuable.
- When users truly can't express what they need, perhaps you can watch them work and suggest ways to automate portions of the job

Elicitation techniques: Listen actively

Practice the techniques of active listening

- leaning forward,
- showing patience,
- giving verbal feedback, and
- inquiring when something is unclear and
- paraphrasing the main idea of a speaker's message to show your understanding of that message

Workshops

- “A structured meeting in which a carefully selected group of stakeholders and content experts work together to define, create, refine, and reach closure on deliverables that represent user requirements.”
- They encourage stakeholder collaboration in defining requirements.
- There will be a facilitator and a scribe.
- Workshops often include several types of stakeholders, from users to developers to testers.

Running Requirements Workshops

Establish and enforce ground rules

- The workshop participants should agree on some basic operating principles.
- Examples include starting and ending on time; returning from breaks promptly; silencing electronic devices; holding one conversation at a time;
- Expect everyone to contribute; and focusing comments and criticisms on issues rather than individuals.
- After the rules are set, ensure that participants follow them.

Fill all of the team roles

- Facilitator
- Scribe - note taking
- Time keeping,
- Scope management

Running Requirements Workshops (continued)

- A facilitator must ensure ground rule management, and making sure everyone is heard :
- A scribe might record what's going on, while someone else watches the clock.
- Plan an agenda Each workshop needs a clear plan
- Create the plan and workshop agenda ahead of time, and communicate them to participants so they know the objectives and what to expect and can prepare accordingly.
- Stay in scope Refer to the business requirements to confirm whether proposed user requirements lie within the current project scope.
- Keep each workshop focused on the right topics

TRAP

Watch out for off-topic discussions, such as design explorations, during elicitation sessions. Keep the participants focused on the session's objectives, while assuring them that they'll have future opportunities to work through other issues that arise.

Timebox discussions

- Consider allocating a fixed period of time to each discussion topic. The discussion might need to be completed later, but timeboxing helps avoid the trap of spending far more time than intended on the first topic and neglecting other important topics entirely
- When closing a timeboxed discussion, summarize status and next steps before leaving the topic.

TOO MANY COOKS

- Requirements elicitation workshops that involve too many participants can slow to a contentious crawl.

Keep everyone engaged

- Sometimes certain participants will stop contributing to the discussion.
- These people might be frustrated for a variety of reasons.
- Perhaps their input isn't being taken seriously because other participants don't find their concerns interesting, or maybe they don't want to disrupt the work that the group has completed so far.
- Perhaps the stakeholder who has withdrawn is deferring to more aggressive participants or a domineering analyst.

Keep everyone engaged

- The facilitator must read the body language
 - lack of eye contact,
 - fidgeting,
 - sighing,
 - checking the clock
- Try to understand why someone has tuned out of the process, and try to re-engage the person.
- Visual cues are absent when you are facilitating via a teleconference, so you have to listen carefully to learn who is not participating and the tones being used.
- You might ask these silent individuals directly if they have any thoughts about the discussion they'd like to share.
- The facilitator must ensure that everyone is heard.

Focus groups

- A focus group is a representative group of users who convene in a facilitated elicitation activity to generate input and ideas on a product's functional and quality requirements.
- Focus group sessions must be interactive, allowing all users a chance to voice their thoughts.
- Focus groups are useful for exploring users' attitudes, impressions, preferences, and needs
- Focus groups are particularly valuable if you are developing commercial products and don't have ready access to end users within your company.

Observations

- Observe users workflow in the task environment
- Observations can be silent or interactive.
- Silent observations are appropriate when busy users cannot be interrupted.
- Interactive observations allow the BA to interrupt the user mid-task and ask a question.
 - understand immediately why a user made a choice or to ask him what he was thinking about when he took some action.
- Document what you observe for further analysis after the session.
- Video recording the session, if policies allow, to refresh your memory later.

Watch Me Bake a Cake

- To demonstrate the power of observations, tell some friends the steps to bake a cake from a mix.
- You'll likely remember the steps to turn on the oven, get out the necessary dishes and ...
- But when you told your friends to add each ingredient, did you remember to say to open the bag with the mix in it?
- Did you remember to say to crack the eggshell, add only the contents of the egg, and discard the shell?
- These seemingly obvious steps might not be so obvious to someone who has never baked before.

Questionnaires

- Questionnaires are a way to survey large groups of users to understand their needs.
- Inexpensive, work for eliciting information from large user populations,
- administered easily across geographical boundaries.
- The analyzed results of questionnaires can be used as an input to other elicitation techniques.
- For example, you might use a questionnaire to identify users' biggest pain points with an existing system, then use the results to discuss prioritization with decision makers in a workshop.

Questionnaires

Preparing well-written questions is the biggest challenge with questionnaires.

- Provide answer options that cover the full set of possible responses.
- Make answer choices both mutually exclusive (no overlaps in numerical ranges) and exhaustive (list all possible choices and/ or have a write-in spot for a choice you didn't think of).
- Don't phrase a question in a way that implies a "correct" answer.
- If you use scales, use them consistently throughout the questionnaire.

Tips on Questionnaires

- Provide answer options that cover the full set of possible responses.
- Make answer choices both mutually exclusive (no overlaps in numerical ranges) and exhaustive (list all possible choices and/ or have a write-in spot for a choice you didn't think of).
- Don't phrase a question in a way that implies a "correct" answer.
- If you use scales, use them consistently throughout the questionnaire.

Tips on Questionnaires

- Use closed questions with two or more specific choices if you want to use the questionnaire results for statistical analysis.
 - Open-ended questions allows users to respond any way they want, so it's hard to look for commonalities in the results.
- Consider consulting with an expert in questionnaire design and administration to ensure that you ask the right questions of the right people.
- Always test a questionnaire before distributing it. It's frustrating to discover too late that a question was phrased ambiguously or to realize that an important question was omitted.
- Don't ask too many questions or people won't respond.

Document analysis

- Document analysis entails examining any existing documentation for potential software requirements.
 - requirements specifications,
 - business processes,
 - lessons-learned collections, and
 - user manuals for existing or similar applications.
- Documents can describe corporate or industry standards that must be followed or regulations with which the product must comply.
- When replacing an existing system, past documentation can reveal functionality that might need to be retained

How do you know when you're done?

Never really, well...

- The users can't think of any more use cases or user stories.
- Users tend to identify user requirements in sequence of decreasing importance.
- Users propose new scenarios, but they don't lead to any new functional requirements.
 - A "new" use case might really be an alternative flow for a use case you've already captured.
- Users repeat issues they already covered

How do you know when you're done?

- Suggested new features out of scope.
- Proposed new requirements are all low priority.
 - The users are proposing capabilities that might be included “sometime in the lifetime of the product” rather than “in the specific product we’re talking about right now.”
- Developers and testers who review the requirements for an area raise few questions.