

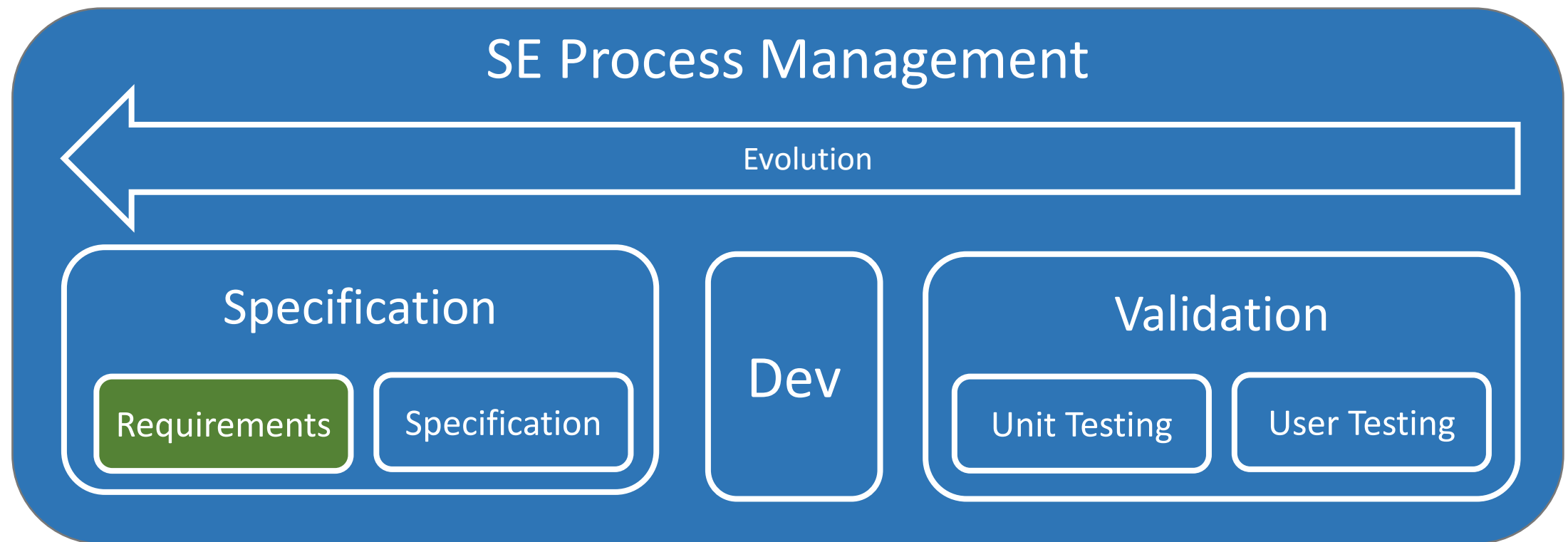
Software Engineering COMP1035

Lecture 04

Requirements Gathering



Keeping Track of SE Module



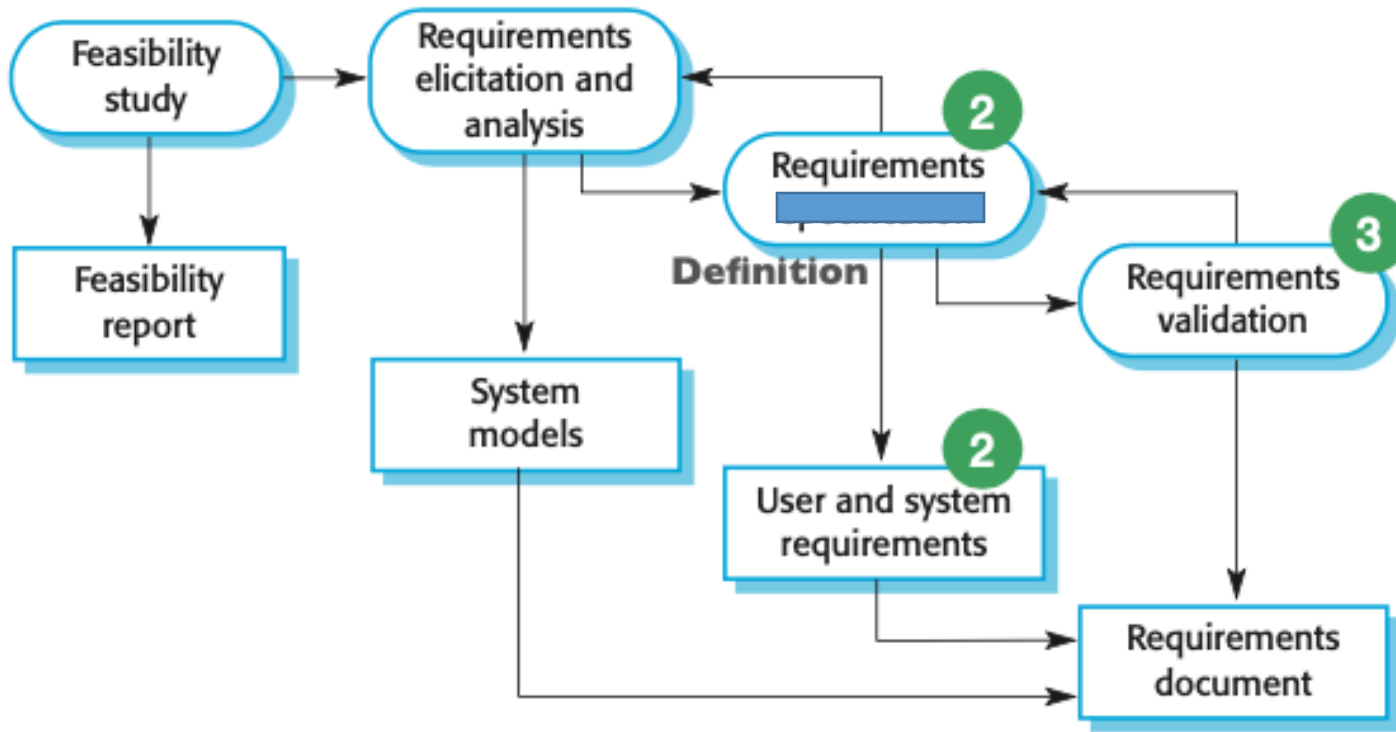


Figure 2.4 The requirements engineering process

Requirements Engineering

Learning Outcomes

The difference between requirements and specifications.

The difference between **functional** vs **non-functional** (requirements & specifications).

Converting data from Requirement Elicitation into actual requirements.

How to go about checking/validating your “actual requirements”.

Documenting Requirements



And Requirements vs Specifications

Requirements VS Specifications

	Functional	Non-Functional
(User) Req.		
(System) Spec.		

Requirements vs Specifications

	Functional	Non-Functional
(User) Req.	<div>A Use Case</div> <ol style="list-style-type: none">1. A module convenor will need to see and check if a student has the pre-requisite knowledge to take their module.	
(System) Spec.	<ol style="list-style-type: none">1. A module convenor shall be able to see a list of students who want to take their module.2. A module convenor shall be able to see the modules/grades of a student.3. A module convenor shall be able to see additional comments put by students.4. A module convenor shall be able to accept/reject a student.5. A module convenor shall be able to contact/ask the student to clarify.	

Requirements vs Specifications

	Functional	Non-Functional
(User) Req.	1. A module convenor has the knowledge to take a module. <div>What a stakeholder needs to be able to do.</div>	has the pre-requisite knowledge to take a module.
(System) Spec.	1. A module convenor shall be able to see a list of students who want to take their module. 2. A module convenor shall be able to see the details of a student. 3. A module convenor shall be able to see the requirements put by students. 4. A module convenor shall be able to see the contact details of a student. 5. A module convenor shall be able to contact/ask the student to clarify. <div>What the software must do to meet the requirement above.</div>	

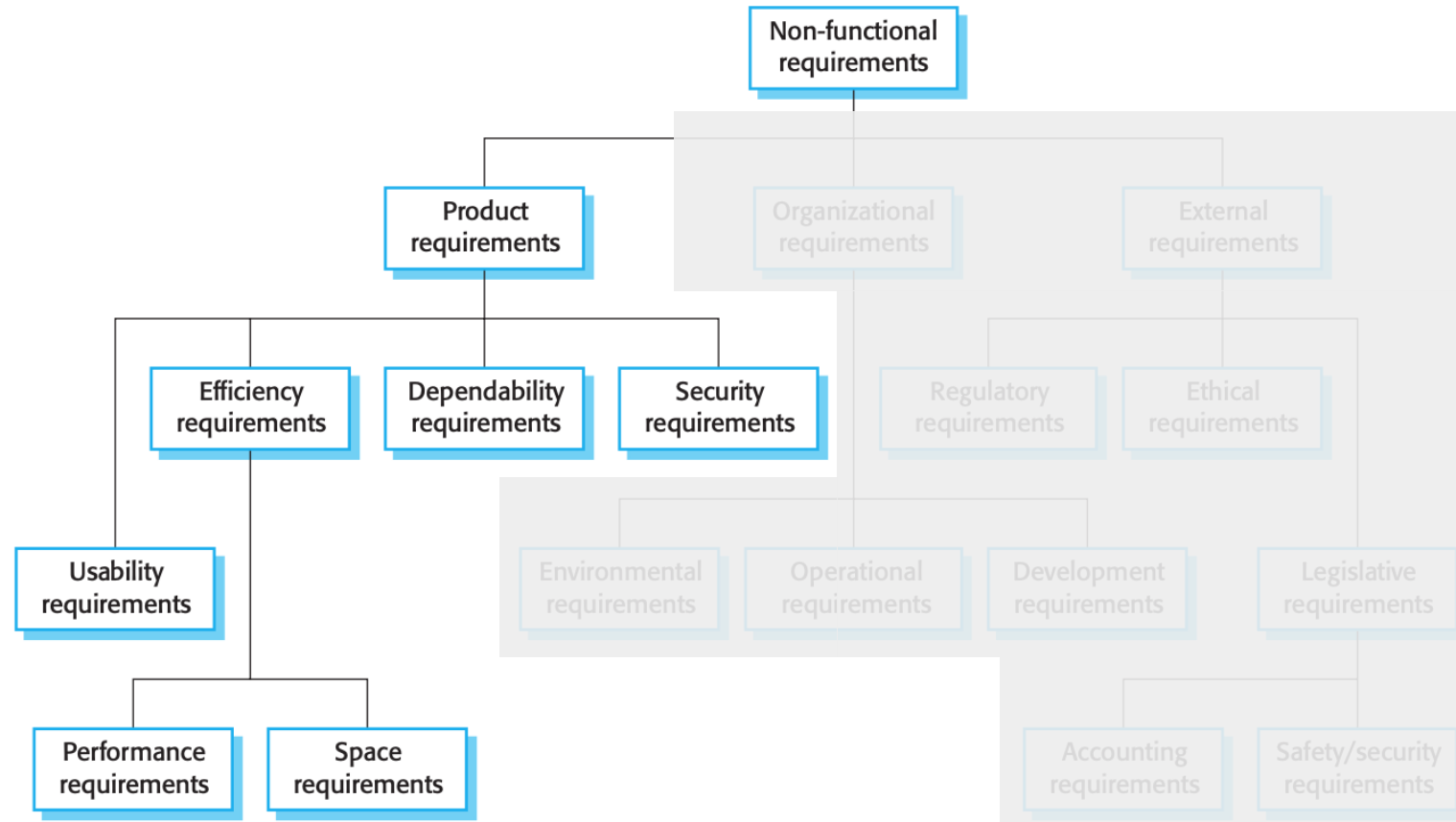
Requirements vs Specifications

	Functional	Non-Functional
(User) Req.	<p>Functions the user needs to achieve (as requirement).</p> <p>Functions the software will include (as specifications).</p>	<p>Constraints on what the user needs to do (as requirements).</p> <p>Constraints on how well the system performs (as specifications).</p>
(System) Spec.	<p>E.g., allow login, provide creation, provide password change, display profile information, edit profile information, close account, delete posts.</p>	<p>Up time, security standards, number of concurrent users, failure safety, must use university authentication etc.</p>

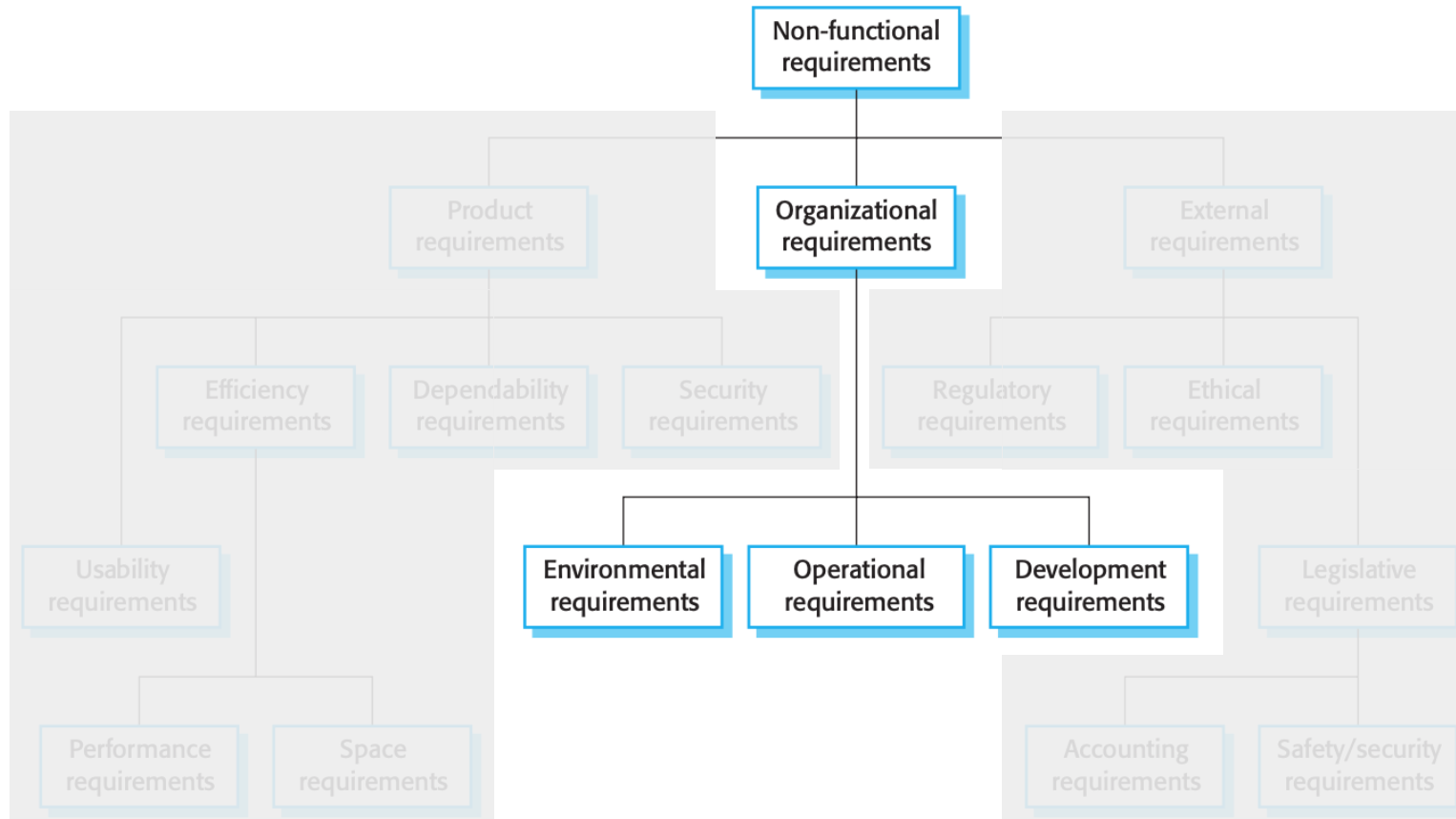
Requirements vs Specifications

	Functional	Non-Functional
(User) Req.	1. A module convenor will need to see and check if a student has the pre-requisite knowledge to take their module.	
(System) Spec.	1.1. A module convenor shall be able to see a list of students who want to take their module. 1.2. A module convenor shall be able to see the modules/grades of a student. 1.3. A module convenor shall be able to see additional comments put by students. 1.4. A module convenor shall be able to accept/reject a student. 1.5. A module convenor shall be able to contact/ask the student to clarify.	

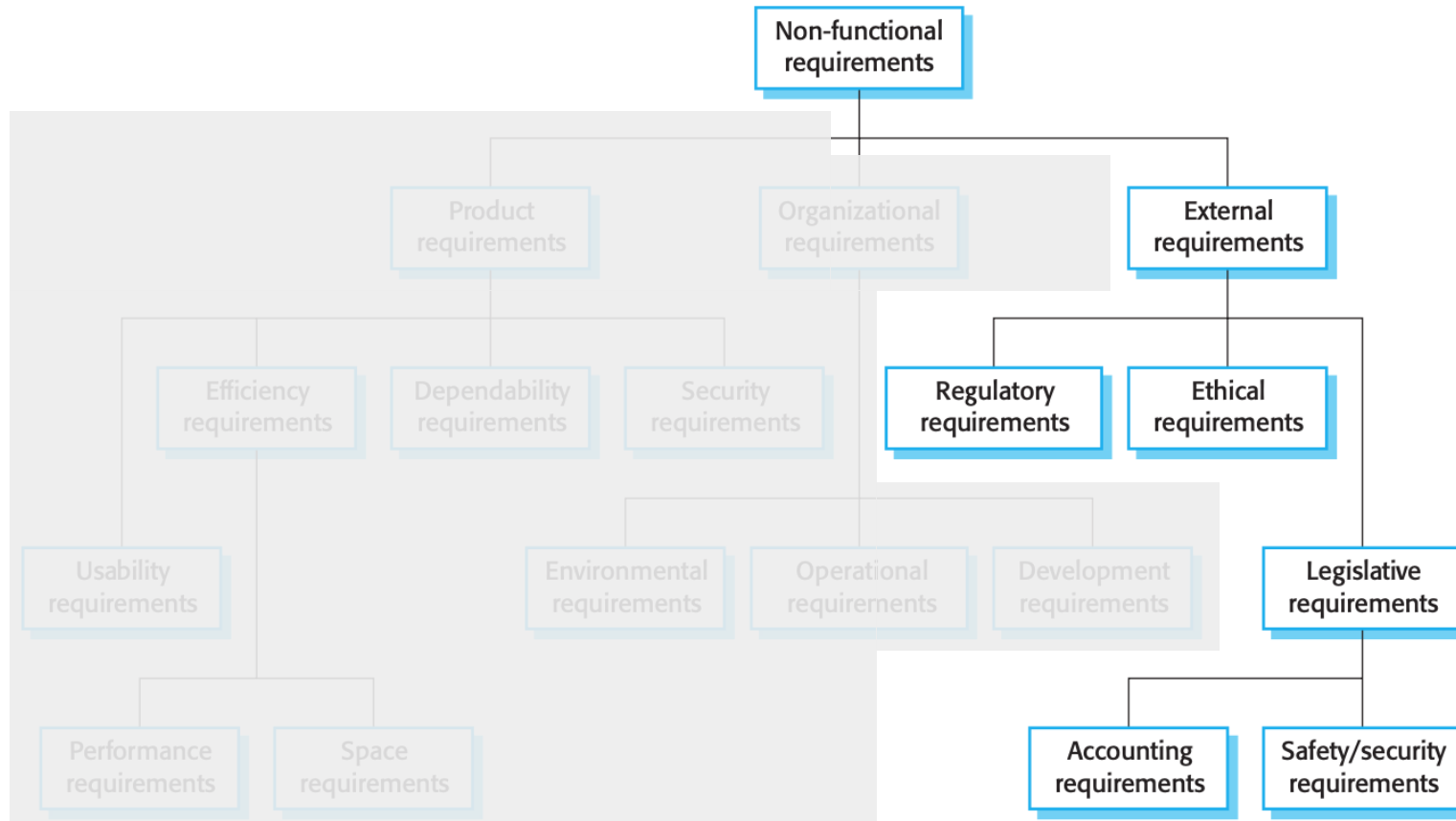
Non Functional Reqs/Specs



Non Functional Reqs/Specs



Non Functional Reqs/Specs



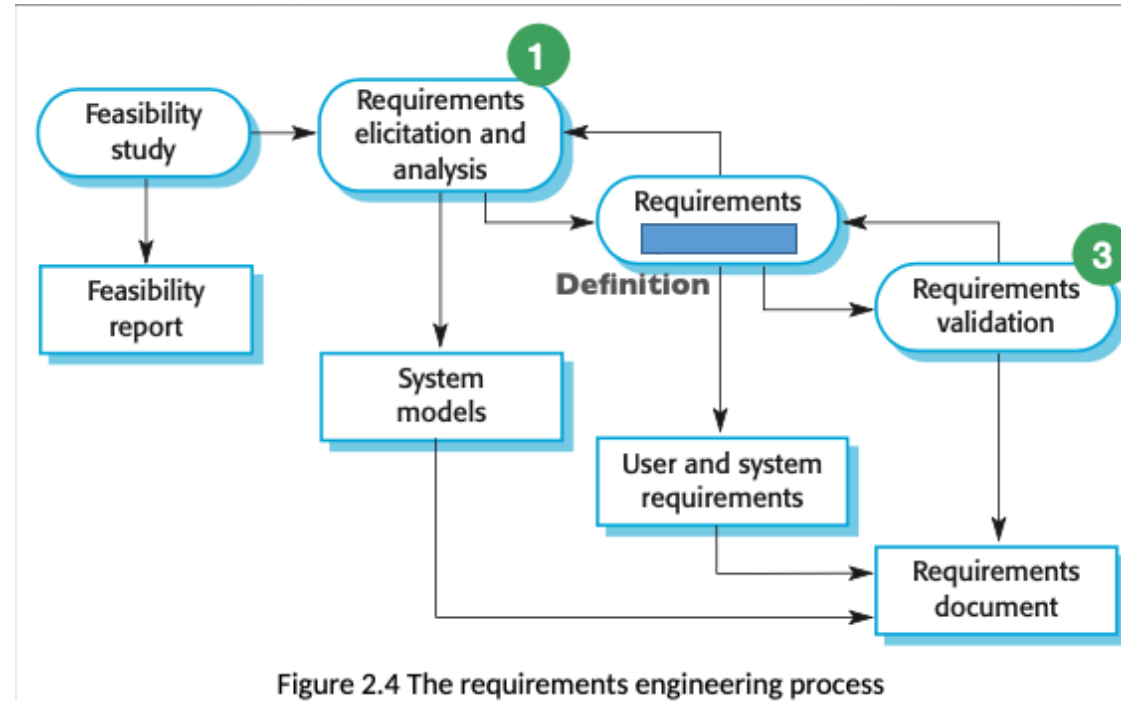
Non-Functional Requirements

- Product NF Requirements
 - *90% of this job happens during the first 2 weeks of each semester and we have extra staff 8 am to 8 pm.*
- Organisational Requirements
 - *We want to login to use university authentication service that uses their university IDs, e.g., scyxxx*
- External Requirements
 - *The software should meet standard web accessibility guidelines, because we want it to work well for students with disabilities.*

Functional or Non-Functional

- A. A user should be able to post a new image.
- B. Ideally it should be able to handle all major image types.
- C. Users should be able to post big high-definition images.
- D. We want animated images (e.g., gifs) to auto play.
- E. A user should be able to repost images they like.
- F. A user should be able to 'like' images they like.
- G. A user should be able to see who else likes the image.
- H. But only people that they are friends with.

Investigating / Validating Requirements



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Requirements Engineering

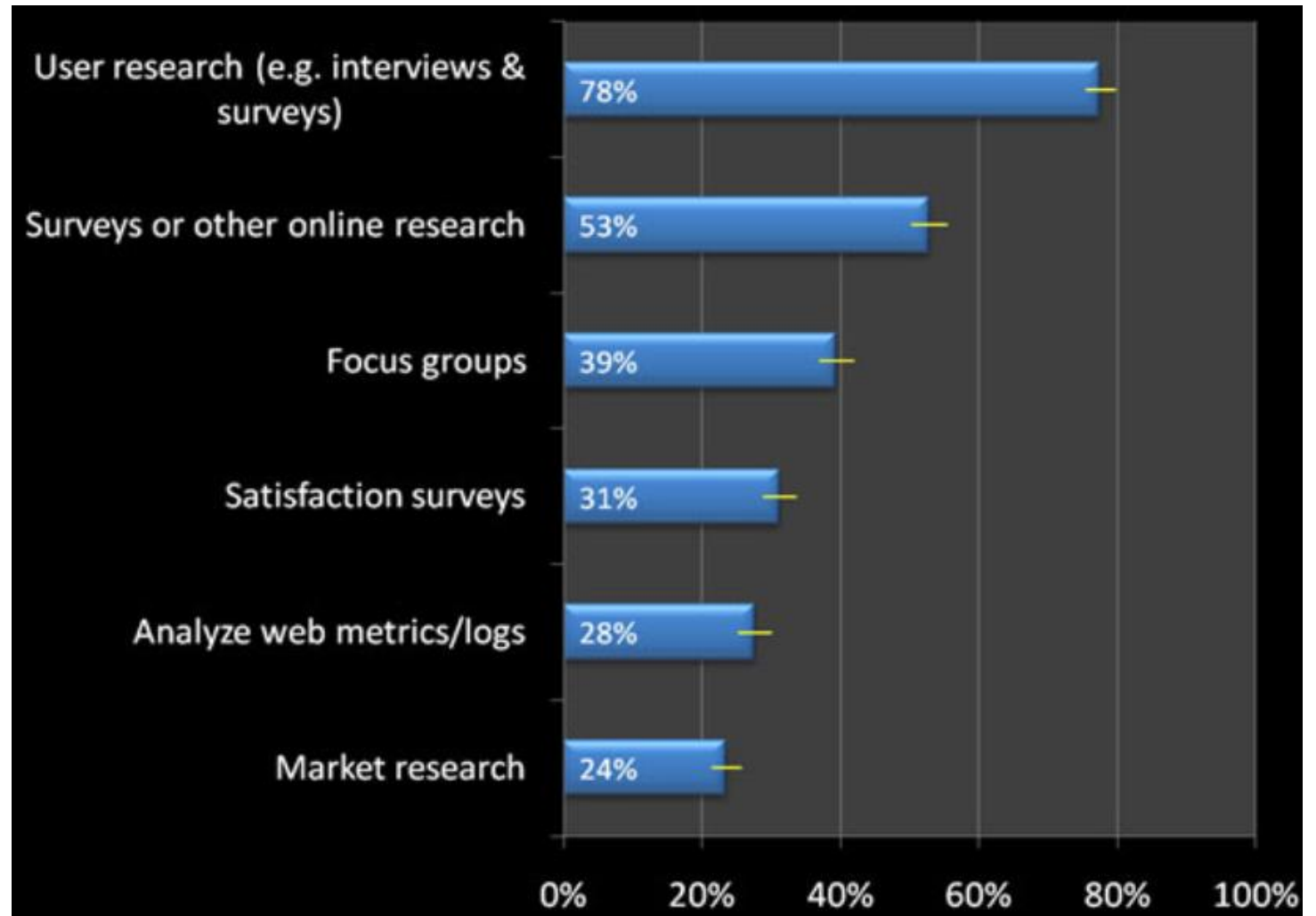


Investigation Techniques

- It's all about the question you ask.
 - You should have questions from the lab.
 - Because there is a lack of clarify in the initial requirements brief.
- It's rarely enough, even, to accept the initial answer to a question.
 - Because that should highlight more things to ask about.
- Use the **initial questions** you had from the brief.
 - To set **investigation goals**, or main topics to discuss.
 - **Choose a technique** to best learn about these things.

Understanding Use Cases

- <https://measuringu.com/ux-methods/>



Surveys

- Good for contacting lots of people, getting a majority view.
- Bad for understanding something in detail.
- Most common mistake: sending a badly made questionnaire.
 - There are many types of question you can ask.
 - These can be 'designed well' to extract a good answer.
- 2nd common mistake: reinvent the wheel.
 - There are well tested, proven surveys you can use.
 - Perceived Ease of Use Scale, Usability Questionnaires, NASA-TLX
- Other common mistakes
 - 2 parts questions, leading questions, surveys are too long.

Interviews & Focus Groups

- Allow you the **freedom** to ask follow up questions.
- Strong interviews have 2 characteristics.
 - Interviewer is open minded, unbiased, **ready to listen**.
 - Interviewer gets interviewee to be **relaxed and chatty** and involved.
- Strongly recommended: get people **to do more than just talk**.
 - Show you things.
 - Draw diagrams/explanations.
 - You show them things to discuss.

Interviews & Focus Groups

- Common mistake:
 - Start an interview without a plan.
 - You should always go with a schedule of topics (even if you leave it behind).
 - This should be a todo list – not a script – be flexible.
 - Specifically designed to get the most from whoever you are talking to.

Interviews vs Focus Group

Pros

- More people at once.
- Faster coverage of users.
- **Discuss differences & opposing opinions.**

Cons

- Possible Conflict.
- Can get a 'dominant speaker'.
- Takes longer to discuss per Question.

8-12 people for breadth, 5-7 for depth, must do more than 1, 2.

Ideally, 2 organisers: 1 leader + 1 notetaker.

Observations





Observations

- Allows you to **see things people didn't say**.
- People rarely know the whole picture (just their slice).
- People are not good at realising everything that's important for you to know.
- Watch and observe what people do:
 - Where people are.
 - Where things are.

Advanced – Technology Tours



Helps you identify what things 'your new software' will work with.

The technology ecosystem it will work in.



Aim: Discover all related technology in a task.



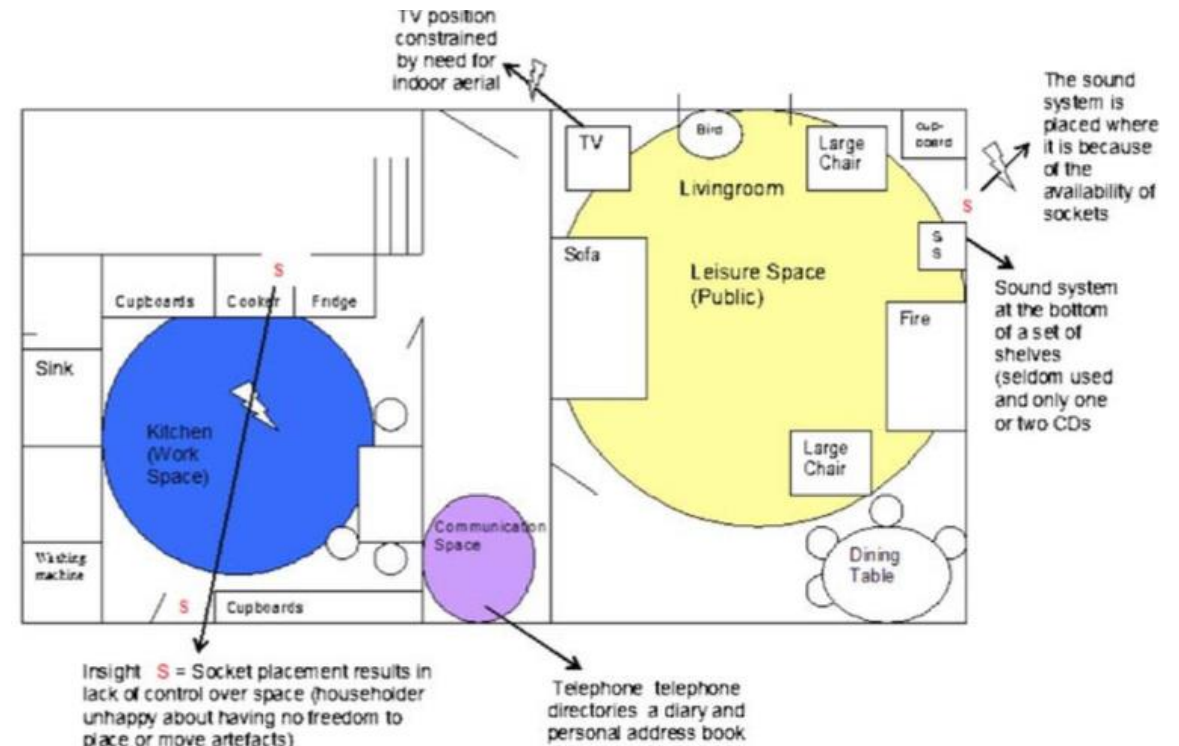
Approach: find out about all the technology in a room.

Advanced – Technology Tours

- Key Questions:
 - What technology is present in this room?
 - Where is it placed?
 - Who uses the technology?
 - What activities does it support?
- Can be helpful activity in interviews, or Contextual Inquiry.



- Create diagrams of this layouts.
- Don't limit yourself to 'computers'.
 - Is a whiteboard important in the process?
 - Why is it?
 - Maybe it compensates for technology they want?
- You could extend this to a virtual idea.
 - Other servers the person uses to do a task.





Advanced – Ethnography

Chapter 4.3.1.2 from book

- There's no better way to learn than **doing**.
- It got an anthropological background to the idea.
- Except the culture is the client's work culture.
 - Get involved, sit and work in their office for a day.
- Traditionally – the longer the better.
 - But any taking part is better than not.
- Focused Ethnography
 - Targetting specific tasks, or roles in the company.
 - Don't wait (if you can't) for a task to happen naturally.

Investigation – Overall Strategy

- Most mistakes are because people don't have a strategy.
 - They send out a survey before they know what the survey should be about.
- One method can help understand the results of another.
 - You can use a survey to better understand something from an interview.
 - You can interview people problems that a survey brings up.
 - You might do an interview after you observed someone for a while.
 - You might decide who to interview based on observing an office.
- Don't forget - decide what you want to learn more about.
 - Identify the stakeholder to investigate and pick a method to suit.

Summary

- Requirements vs Specifications.
- Functional vs Non-functional (Requirements and Specifications).
- Methods to validate requirements:
 - Advanced methods;
 - Technology tours
 - Ethnography



THANK

YOU