



Requirement Analysis – Getting the Big Picture

School of Computer Science | Software Analysis & Design

Marta Kristín Lárusdóttir, Associate professor

27. August, 2019



www.hr.is

Content

- Why Bother? Avoiding Miscommunication
- Describing the “Big Picture”
- Functional Requirements

Reading:

- Chapter ID ch. 11.1 – 11.3, pg. 385 - 395



www.hr.is

How Will You Benefit from this Lecture?

- You will make a map (draw the big picture) during the next problem solving class
- You will make a requirement list during the next problem solving class
- You will make a requirement list in your group work assignments



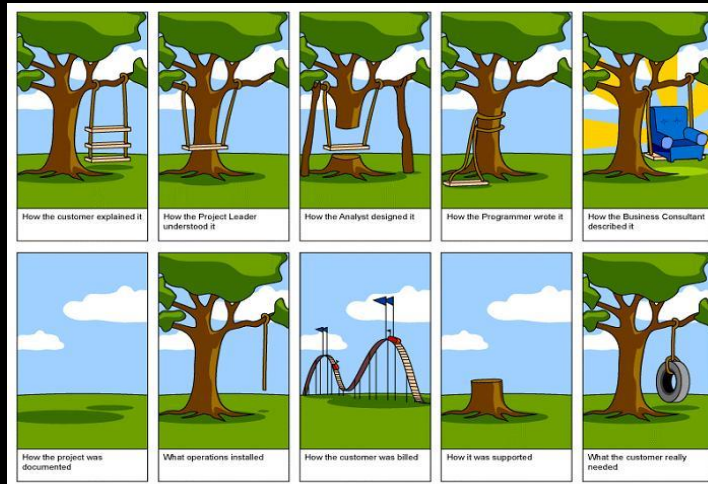
www.hr.is

Why Bother? Avoiding Miscommunication



www.hr.is

Understanding different views

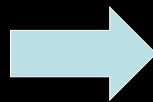


www.hr.is

The picture should be like this



This is what the user (customer) needed



This is what the customer got



www.hr.is

Does the user always know what he needs?

IF I HAD ASKED MY
CUSTOMERS WHAT
THEY WANTED, THEY
WOULD HAVE SAID A
FASTER HORSE.

- Henry Ford



www.hr.is

I want to control my information

- What does this mean?
 - You need information on the user
 - Several ways to design it



www.hr.is

When the users wanted a faster horse

- What did they need?



www.hr.is

Good system design – in this course

User needs analysed
through interviews

Your own knowledge
and creative thinking

Good System

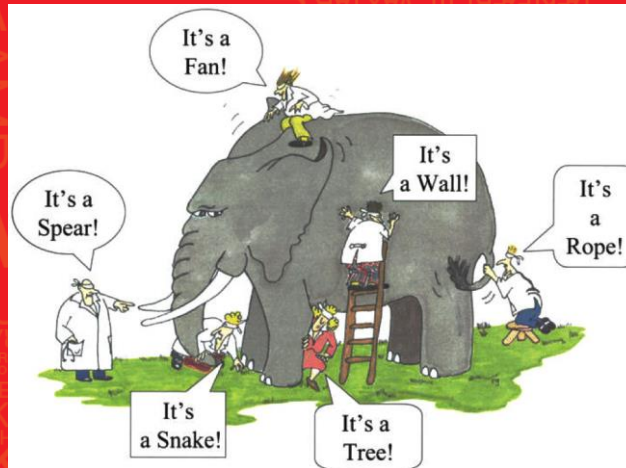
Analysing other
designs

Trends today

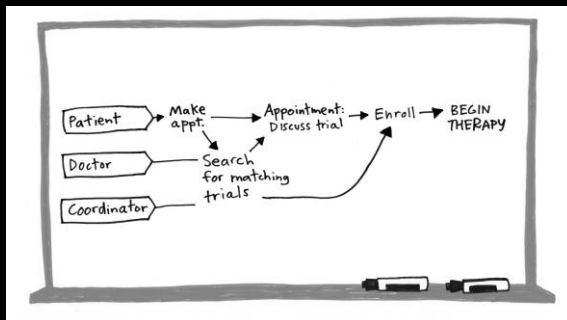


www.hr.is

Describing the „Big Picture“ by Drawing a Map



Make a map



This will be a simple diagram with around 5-15 steps.



Drawing a map of the big picture – Instructions

1. List the user groups
 - On the left
2. Write the long term goal
 - The overall goal of the product
 - On the right
 - Buying coffee, Finding info on persons easily, ...
3. Words and arrows between
 - Describing the steps that need to be taken
4. Keep it simple
 - The map should have from five to around fifteen steps
5. Ask for help
 - This is a teamwork process



www.hr.is

Let's take an example

- A customer wants to buy good fabric to make curtains from in his/her livingroom
- Who are the users?



www.hr.is

Write the user groups to the left

Fabric Seeker

Agent

Manufacturer



www.hr.is

The User Groups Should be Described

	Fabric Seekers	Agent	Manufacturer
WHO	Age: 0 - 99 Gender: All genders Education: All levels and kinds of education Abilities/Disabilities: nothing special Computer skills: Very good Number: hard to estimate	Age: 19 - 99 Gender: All genders Education: Graduated from high school Abilities/Disabilities: nothing special Computer skills: Very good Number: 10 in our company	Age: 20 - 99 Gender: All genders Education: Graduated from university Abilities/Disabilities: nothing special Computer skills: Various, depends on the age Number: we collaborate with 30 manufacturers
WHY	Seek for fabrics and gather information on those. Compare fabrics	Take care of orders and delivery	Make information available for fabrics
HOW	The technical environment varies, but usually they have good equipment and internet connection	The technical environment varies, but usually they have good equipment and internet connection	The technical environment varies, but usually they have good equipment and internet connection
HOW OFTEN	How often: Only used infrequently, when seeking fabrics For how long each time: The system is used for ca. 30 mins - 1 hour each time	How often: Used frequently at least weekly For how long each time: The system is used for ca. 30 mins - 1 hour each time	How often: Maybe used once a month For how long each time: The system is used for ca. 15 mins each time
HOW WELL	Skills: Users will never get skilled in using the system, since they use it so infrequently	Skills: Users will at least be intermediate	Skills: Users will never get skilled in using the system, since they use it so infrequently
HOW IMPORTANT	MOST IMPORTANT	Third most important	Second most important



www.hr.is

Drawing a map of the big picture – Instructions

1. List the user groups
 - On the left
2. Write the long term goal
 - The overall goal of the product
 - On the right
 - Buying coffee, Finding info on persons easily,
3. Words and arrows between
 - Describing the steps that need to be taken
4. Keep it simple
 - The map should have from five to around fifteen steps
5. Ask for help
 - This is a teamwork process



www.hr.is

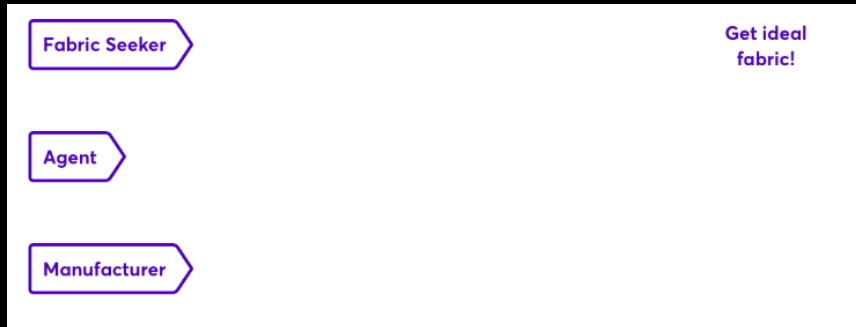
What is the long term goal?

- Examples
 1. Bring great coffee to new customers online
 - Wanted to keep the quality of the experience in the goal
 - Wanted to challenge themselves to reach new customers
 2. Using a Relay robot to make a better guest experience
 - Wanted to focus on customers
 - Use the same goal as the hotels: better guest experience
- In the fabric seeking example?
 - Write that to the far right



www.hr.is

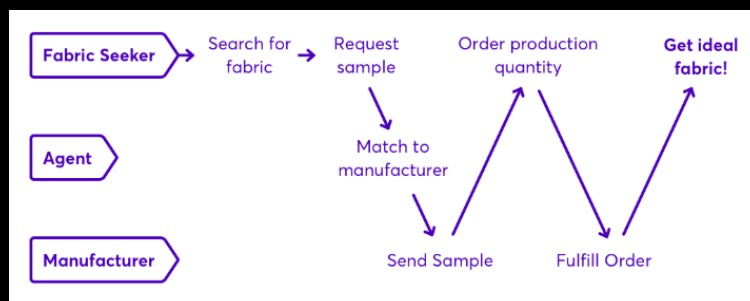
The Big Picture with the Long Term Goal



www.hr.is

What are the steps?

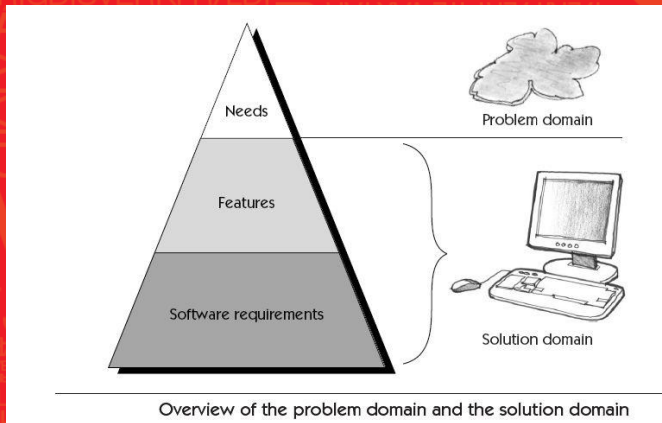
- Make a flowchart in between showing how the users interact with your product
 - Keep it simple 5 – 15 steps



- The steps are the functions that need to be in the product

www.hr.is

Functional Software Requirements



What is a requirement?

A well defined, testable statement that can be verified

Example of a good requirement:

"All users shall be able to rent a book"

short, single responsibility

A bad requirement:

"The system should be really fast"

vague, how fast is really fast?

Better:

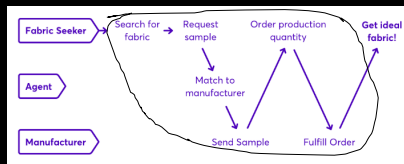
"The average response time should be less than 500 milliseconds when executing a query"

This is precise and testable and can be verified



Functional requirements

- Functional requirements
 - implemented features
 - "it should be possible to borrow a book"
 - rules
 - "a user may not borrow more than 3 books simultaneously"
- Functional requirements
 - Describe what the users should be able to do in the system
 - The functions that will be available in the system
- Functional requirements
 - Describe in more detail the steps on the map



www.hr.is

For stating functional requirements

- Think about **USERS**
 - What do they need to be able to do?
 - What does each users group want?
- Describes **WHAT** the user wants to do but not **HOW**
 - Example: Order healthy food for a family
- Has a start and an end
 - The user can achieve his goal and start doing something else
 - NOT: I want to log in
 - this is an action, for partly fulfilling the user goal, but the user has not finished – therefore this is not a user goal

www.hr.is

Actually you have some functional requirements already in Group project 1

The minimum functional requirements

1. Send in an order for each week for the ingredients of meals
2. Check what was ordered for a particular week both past in time and in the
3. Rate a particular recipe of how tasty it was
4. Check how others rated a particular recipe
5. Check the recipes for the meal
6. Check the ingredients of a meal
7. Select days during the week where you would like to get the food delivered
8. Get an overview of the recipes that are available for a particular period that are in a particular group (fx. Vegan, paleo, keto or classic)
9. Get information on where the user get the ingredients delivered
10. Get an overview of what the user has selected over a period of time



www.hr.is

The Rules – Hand-in Group Project 1

1. Customers can buy one week at a time or have a permanent subscription.
2. Each recipe is marked with the group it is grouped in: tx. Vegan, paleo, keto or classic
3. For each day the user can chose from the groups of recipes
4. The customers pay the delivery cost
5. The bill is send each week for the users ordering weekly and montly for the users having permanent subscription



www.hr.is

Functional Requirements + User Groups

	Námsmenn vegna lána	Greiðendur námslána	Iðfurnarstyrkþegar	Umboðsmenn	Ábyrgðarmenn	Aðrir notendur
1. Fásvör við: hvernig á að sækja um lán	X			X		
2. Fásvör við: hvernig kjörin eru	X			X		
3. Fásvör við: hvenær kemur lán til útborgunar	X			X		
4. Fásvör við: hvaða nám er lánshæft	X			X		
5. Fásvör við: ábyrgðir á lánum	X	X		X	X	
6. Ferlið frá a - ö (umsókn, útborgun, afborganir...)	X			X		
7. Upphæðir og gjalddagar afborgana		X			X	
8. Hve lengi standa endurgreiðslur yfir	X	X		X	X	
9. Möguleikar á að borga upp lán	X	X		X	X	
10. Úrræði vegna greiðsluferfðleika			X		X	
11. Hvað gerist ef afborgun er ekki greidd			X		X	
12. Hvernig á að sækja um styrk				X		
13. Hvenær kemur styrkur til útborgunar			X			
14. Hvaða nám er styrkhæft			X			
15. Hvaða skilyrði eru fyrir styrk			X			
16. Upplýsingar um hlutverk umboðsmanna				X		



www.hr.is

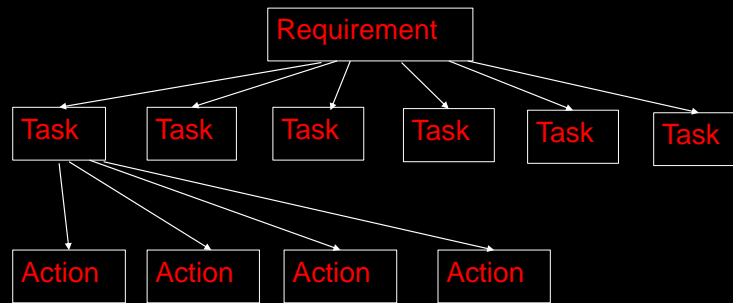
Definitions – Functional Requirement

- Functional requirements
 - Describes WHAT the user wants to do but not HOW
 - Example: Order healthy food for a family
 - Has a start and an end
- For describing HOW to fulfill the requirements
 - You have tasks
- For each task
 - You have actions



www.hr.is

The Hierarchy



- In the requirement list there are only requirements
 - Not tasks nor actions



www.hr.is

Definitions – What is a Task?

- Task (ísl. Verkpáttur eða verkefni)
 - Is a structured set of related activities that are undertaken in some sequence
- Task are what a person has to do in order to accomplish a goal
 - Examples of tasks:
 1. Go to a web site that sells healthy food
 2. Pick the meal
 3. Pay with a card
 4. Insert information on delivery
- The goal is not achieved until all tasks have been completed



www.hr.is

Definitions – What is an Action?

- Action (ísl. Aðgerð)
 - Is an individual operation or step that needs to be undertaken as part of the task
 - In the task: Pick the meal the actions are:
 1. Select the particular meal
 2. Pick the date
 3. Define how many proportions you want to buy

Functional requirement 1: Order healthy food for a family

Task 1: Go to a web site that sells healthy food

Task 2: Pick the meal

Action 1: Select the particular meal

Action 2: Pick the date

Action 3: Define how many proportions you want to buy

Task 3: Pay with a card

Task 4: Insert information on delivery



www.hr.is

Two examples

Functional requirement 1 = To buy a Vegan meal

Functional requirement 2 = Find a meal for next week

- Are the tasks and actions the same for the two goals?
- Let's look at eldumrett.is



www.hr.is

Requirements based on user needs = the fundamental item in all software development



www.hr.is

Requirement list

- A requirement list will often look something like this:

Number	Name (and possibly a short description)	User group(s)	Priority (A/B/C)	Additional info
...

- **Number:**
 - an incrementing number which identifies each requirement
- **Name/description:**
 - short description of the requirement
- **User group(s):**
 - a list of user groups which have to do with this requirement
- **Priority:**
 - how important this requirement is:
 - A: absolutely essential
 - B: useful, but not mission critical
 - C: nice-to-have
- **Additional information:**
 - Can be used to connect to more detail, such as use case descriptions



www.hr.is

Summary

- Why do users want to use the software?
- Describing the “Big Picture” by drawing a map
- Functional requirements

