8. User Research

> You are not THE user.
>
> THE user does not exist.
>
> Emphasize and understand your userS.

Even if you belong to the group of users, who will use the app, even if you share the same problem, your app is addressing and trying to solve. You are not the user. Period. And if you know one user, you know one user, and you are able to develop an app addressing the needs of this single user. However, you will not develop an app for one user only.

The goal of user research is to

- understand the problem to be solved
- emphasize and understand the users
- know the context of the application

To do so, there exist different research methods, see A Guide to Using User-Experience Research Methods

In this module you will follow the following process with the goal to define a good minimum viable product (see MVP):
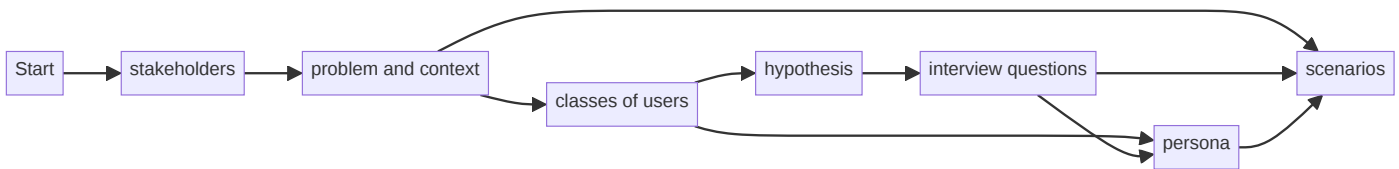
This will be the base to define the requirements, as described in the next chapter.

See also 📷 Stefan Zander on User Research. The article Understanding User Needs: A Guide and Some Tips to Conducting Effective UX Research gives a good overview of some ideas addressed in this chapter.

8.1 Stakeholders

Scrum.org defines stakeholders as "Anyone who is impacted by the outcome of the product and is interested in its success is considered a stakeholder.

Examples of a Scrum Team's stakeholders may include:

- **Customers** - users and buyers of the product
- **Internal stakeholders** - company management and other organizations such as Human Resources/Talent Management, compliance, finance, etc.
- **Partners** - suppliers, vendors and other business partners

- **Influencers** - external influencers such as trade organizations, media or industry analysts

Engaging with stakeholders is central to the success of any kind of product development. Only they can provide the feedback necessary to ensure that the product satisfies their needs and expectations."

Make sure, you do not miss a stakeholder.

> 🔥 **Tip**
>
> Missing stakeholders lead to missing requirements.

8.2 User Research Methods

You either have an idea for an app or you are hired to develop or improve an app. Whatever it is, write down your first understanding of the problem and as much as you know of the context.

Whatever the stakeholders say, they want or need. Don't take it at it seems.
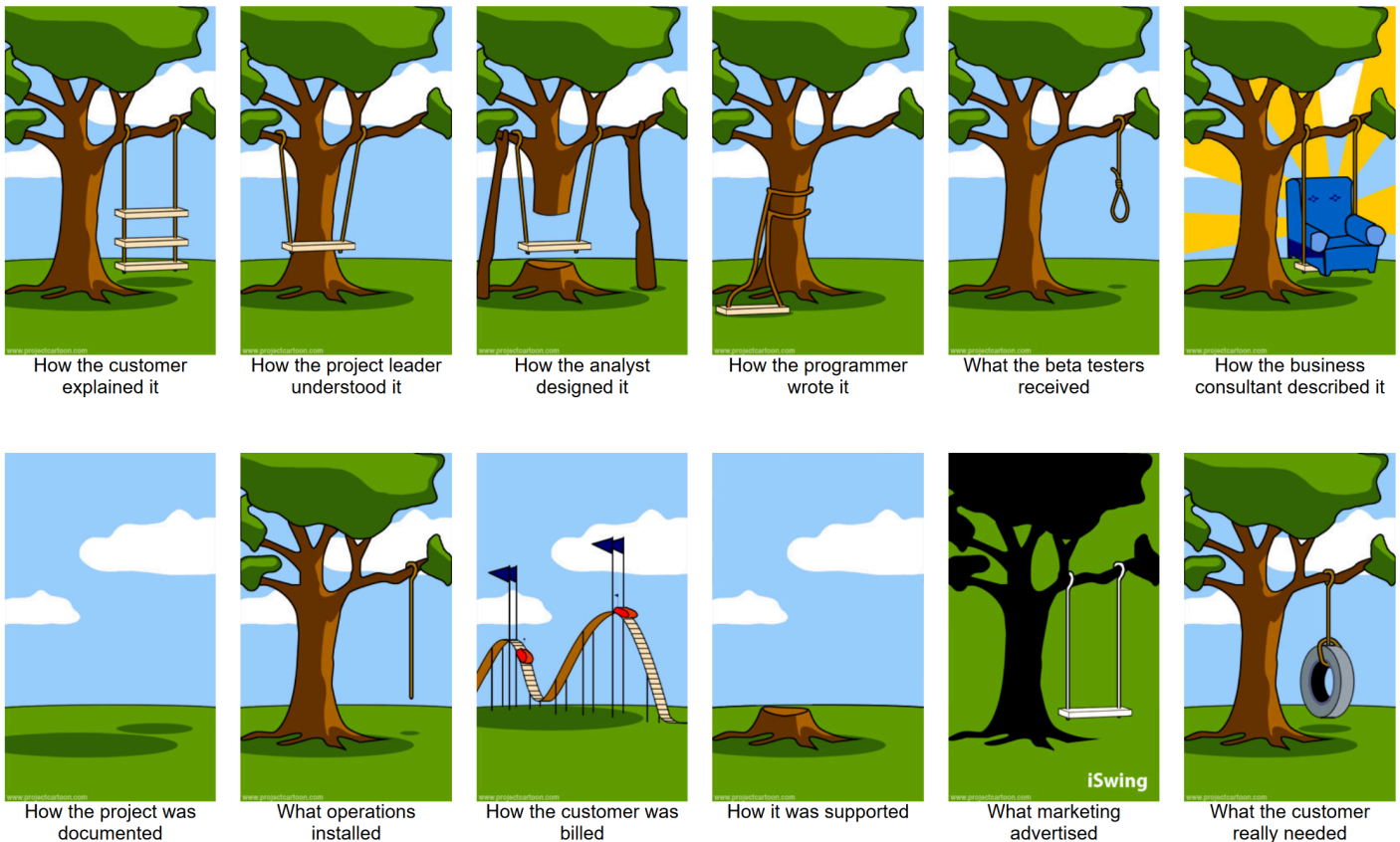
How projects really work - projectcartoon.com
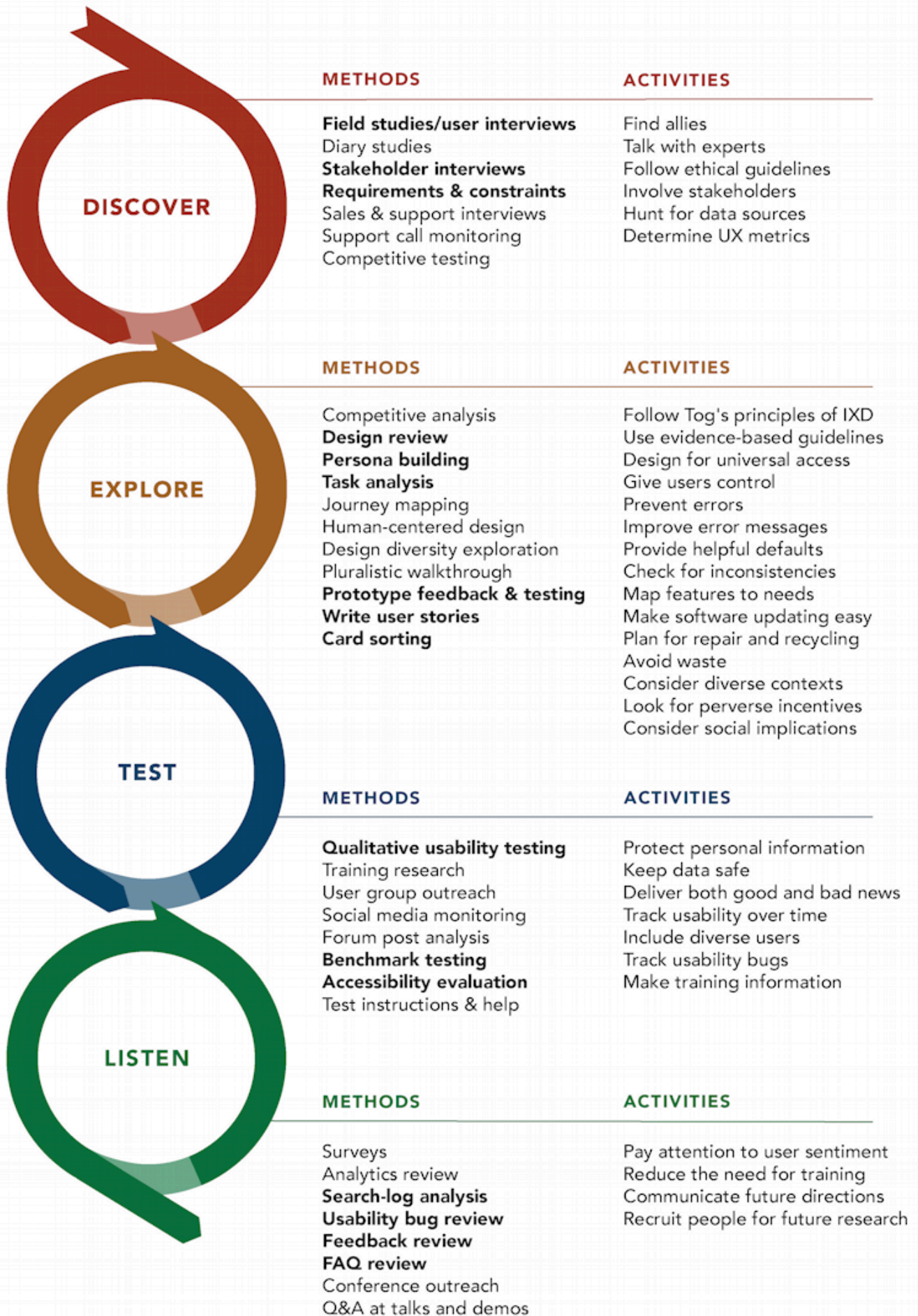
You need to know your users and their surrounding system, to be able to develop a valuable product.
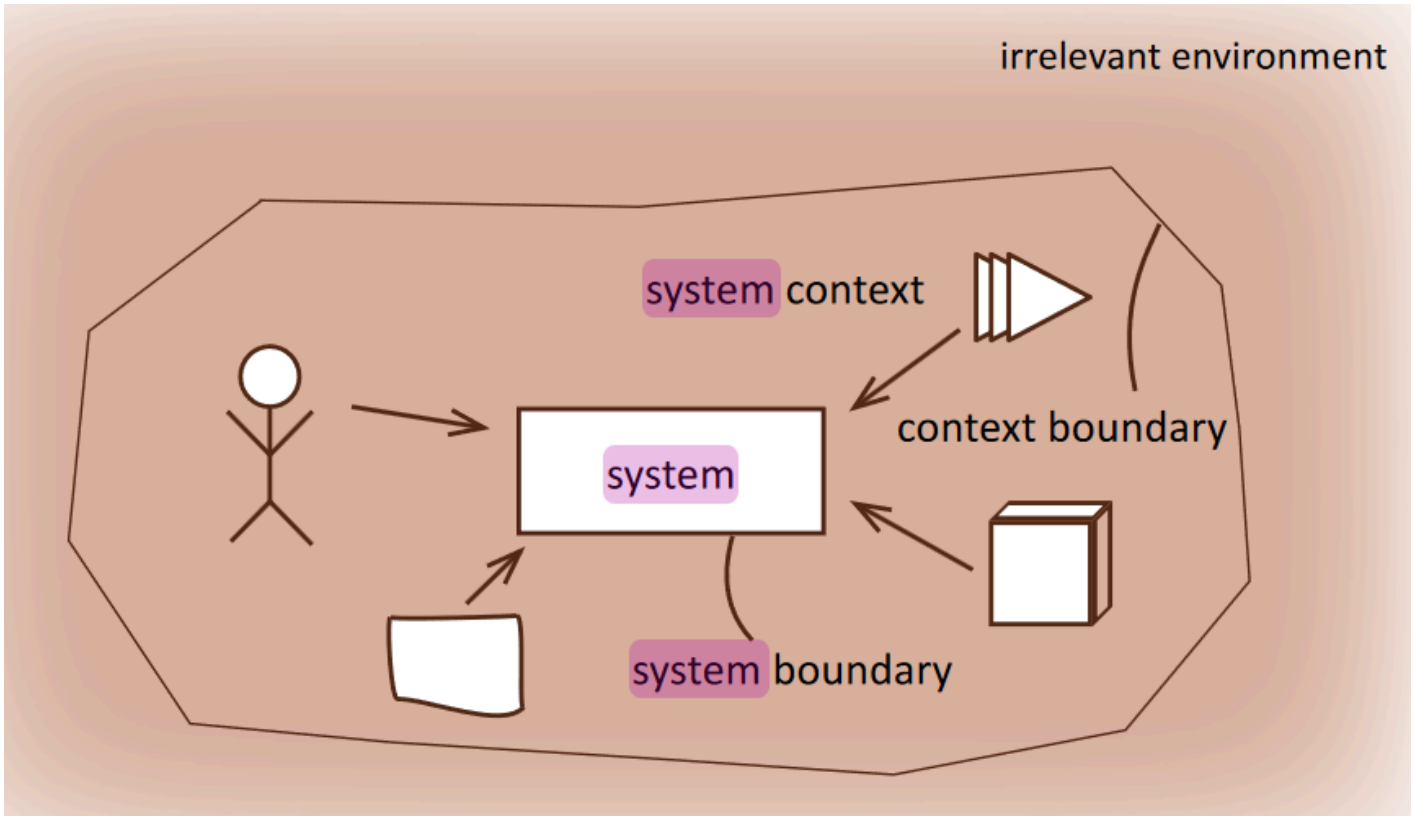
System Boundary - The SOPHISTs: Agile Requirements Engineering

User research is not something, you do once at the beginning of a new product. It is iterative, as the development of the product itself. Hence, depending on the phase of your current release, you will use different methods

UX ACTIVITIES IN THE PRODUCT & SERVICE DESIGN CYCLE

DISCOVER

METHODS

Field studies/user interviews
Diary studies
Stakeholder interviews
Requirements & constraints
Sales & support interviews
Support call monitoring
Competitive testing

ACTIVITIES

Find allies
Talk with experts
Follow ethical guidelines
Involve stakeholders
Hunt for data sources
Determine UX metrics

EXPLORE

METHODS

Competitive analysis
Design review
Persona building
Task analysis
Journey mapping
Human-centered design
Design diversity exploration
Pluralistic walkthrough
Prototype feedback & testing
Write user stories
Card sorting

ACTIVITIES

Follow Tog's principles of IXD
Use evidence-based guidelines
Design for universal access
Give users control
Prevent errors
Improve error messages
Provide helpful defaults
Check for inconsistencies
Map features to needs
Make software updating easy
Plan for repair and recycling
Avoid waste
Consider diverse contexts
Look for perverse incentives
Consider social implications

TEST

METHODS

Qualitative usability testing
Training research
User group outreach
Social media monitoring
Forum post analysis
Benchmark testing
Accessibility evaluation
Test instructions & help

ACTIVITIES

Protect personal information
Keep data safe
Deliver both good and bad news
Track usability over time
Include diverse users
Track usability bugs
Make training information

LISTEN

METHODS

Surveys
Analytics review
Search-log analysis
Usability bug review
Feedback review
FAQ review
Conference outreach
Q&A at talks and demos

ACTIVITIES

Pay attention to user sentiment
Reduce the need for training
Communicate future directions
Recruit people for future research

Bold methods are some of the most commonly used.

8.2.1 Context Research

To understand the problem and the context it is good to observe, how people solve the problem now. This process is known as shadowing. You need to understand the problem and the context, e.g.

- veterinary wants to document her examination of a dog
- she will wear gloves
- the dog might walk on a tablet
- it might be noisy
- she might examine the dog at its home and be offline
- she has an assistant entering data into a desktop pc
- she has a praxis management system that offers more functions, than she knows
- ...?
- Forestry workers want to manage the tree population digitally.
- their hands might be larger than yours
- it might rain
- they might be offline
- ...?
- a calendar app should improve your productivity
- you want to use the same calendar on different devices
- you want to import external entries from another system
- you want to define regular preparation of labs
- you want to share a party event
- blind people should be able to use the app
- the calendar should be used by different cultures
    - colors are symbolic and different
    - letter sizes differ
    - right to left
    - ....
- ...
- your intelligent fridge
- ???

Whatever the user tells you it is only a selected subset of the information needed to understand the problem. The differences increase if you do not know the field, the domain, e.g. hospital, finances, ... Shadowing is a method of the wider field of field studies.

"A **field study** is a type of context research that takes place in the user's natural environment (sometimes referred to as *in situ*, Latin for "in place") as opposed to a lab or an orchestrated setting."[1]

- Observing users in real scenarios will provide you with specific data that directly applies to your audience.
- The context in which people do their tasks can reveal things you wouldn't know to ask about

Some of the following questions might be answered by your observations

- What problem should the app solve?
- How is the problem solved at the moment?
- manually
- different tools, but with dissatisfaction
- ...?
- Who has the problem?
- How often will the app be used?
- Who will use the app how?
- different users?
- surrounding?
- gloves?
- noisy?
- offline?
- ...?

8.3 Users
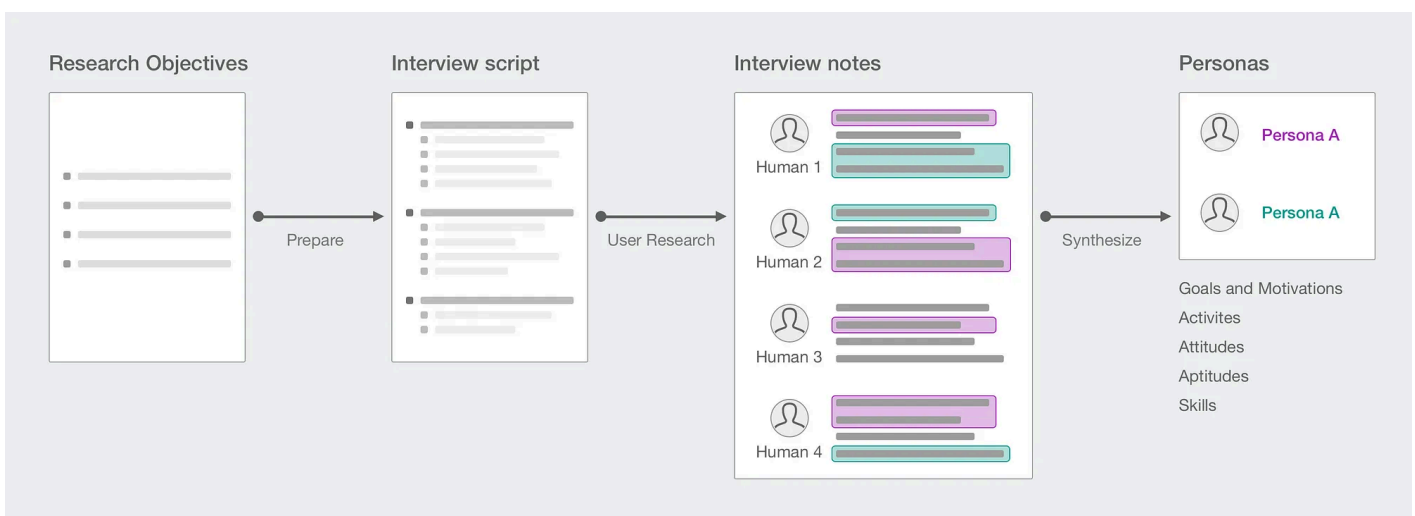
Process to develop personas

To know your users is a process and follows some standards. It is not just brainstorming and coming up with some artificial users.

According to your observations think of possible users of your product and how they might be different. What are possible criteria? Do not assume too early, that a criterion is irrelevant to distinguish your users. You might decide this later. At this stage it is better to gather as much information as possible.

E.g., for a tablet app, that should support the documentation of an examination of a dog, the following criteria might be relevant for the veterinarians

- time of examination for each dog: [15 min, 30 min, 45 min]
- detailed report for the insurance: [yes, no]
- has assistance: [0, 1, 2]
- praxis management system: [closed, cloud, readable database]
- preferred way of documentation: [text, visual, as detailed as possible]
- needs
- pain-points
- age: [<30, <50, <70]
- technical affine: [very, little, ...]
- explorative
- motivated
- education
- ...

You see, you might start with the criteria you have in mind, cause you think of features. And that's ok. The criteria at the end of the list are also important, as you might need to give detailed instructions or help on demand or ....

But there might be other users like assistance, maybe the pet owners, who should document symptoms, ...

Create a table with all observed users and the users you can think of and fill in the criteria for them.

You could map this table to points in an n-dimensional vector space, where n is the number of criteria. Now you try to define **classes of users** with similarities, i.e. users with a small distance are in one class. Look at the users of one class and label them, e.g.

- expert veterinaries or veterinaries of a clinic who will examine valuable dogs like assistant dogs or drug dogs
- veterinaries who work on their own in a small practice
- ...

Try to identify representative users for each class of users.

> ⚠️ **Warning**
>
> Average users lead to average requirements.

You will not fulfill all requirements and ideas mentioned by any user, you need to validate and prioritize them. Otherwise you might end up with something like
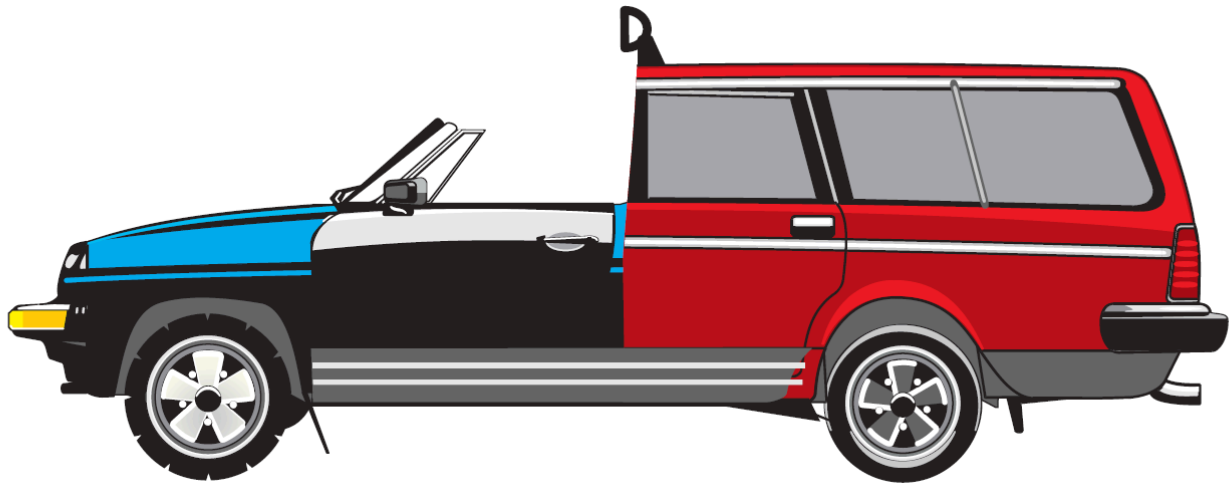
from Dr. Keith Andrews HCI, Lecture Notes 2017, IICM, Graz University of Technology.

Hence, try to pick non-average users, maybe even extreme users. Schedule interviews with those users and prepare these interviews with the following steps.

8.3.1 Hypothesis

> ✏️ **Cite**
>
> "A hypothesis can be described as a concise prediction about the outcome of an experiment. For example, you could predict that a group of participants will prefer a speech-based version of a mobile information service to a touch-tone version of the system." [2]

Here are some sample hypotheses:

1. **Research Question**: What are the health and behavioral benefits of tracking your nutrition through a mobile app?
   Hypothesis: Increasing calorie consumption tracking will result in a decrease in the number of doctor's visits.

2. **Research Question**: Which travel modalities (airplane, train, boats) have the most delays?
   Hypothesis: Low-cost travel industries are more likely to have delays than premium travel.

3. **Research Question**: Does a remote work arrangement improve job satisfaction?
   Hypothesis: Employees who have remote working hours will report greater job satisfaction than employees who work in an office with defined hours.

See also User Research – The Importance of Hypotheses .

In addition, you need to formulate hypotheses addressing the need for your app, i.e. what are the flaws of the current way of solving the problem? What are the competitors and what flaws do they have?

8.3.2 Interview

> **ℹ️ interviews**
>
> "User interviews help you learn who your users are, what their experiences are like, and what they need, value, and desire." [3]

We will perform semi-structured interviews. Semi-structured interviews have common questions and a good flow of questions and are flexibel to go into more depth as the interview evolves or if something comes up, you did not have in mind.

> **✏️ hypothesizes**
>
> The interviews should help to validate or falsify your hypothesizes and to give your clear hints of the needed features of your product.

The interview guide consists of

- introduction, warm up
- questions
- anything to add?
- wrap-up and thanks

Moderation: appreciative, do not let fears arise, person should feel as comfortable as possible, feedback is important for, elaborate on this again and again.

8.3.2.1 Start and end of an interview

Whenever you start an interview, consider the following (order it as you like)

- If you did not invite a special person, ensure as quick as possible, if the person is of interest for the project
- Introduce everyone with their roles in this interview and names, without a title, and without being intimidating
- Describe the goal of this interview shortly
  - elaborate, you are not testing the person, but your idea, everything the users says or discovers is very valueable
- Duration and process
- Voluntary interview, option to end the interview or decline to answer any question at any time, without any consequence.
- Data handling (who has access, anonymized)
- Signature for declaration if needed
- Collect data on the test person, if not known (briefly!)
- Pleasant atmosphere
- Phone off, no disturbance

After you asked your prepared questions and follow-ups, make sure to ask the users, if they want to add something, are interested in beta testing etc. and thank them enthusiastically.

- Is there anything else that could be important for us?

- Would you be interested in staying up to date? Ask for contact data.

- I am truly grateful for the time you have invested and the invaluable insights you have shared on our product. Your expertise and feedback have been incredibly helpful, and I am honored that you took the time to provide such thoughtful perspectives.

8.3.2.2 Good questions to ask

- Walk me through your day.

- What do you spend most of your time on? (task priority)

- Describe the problem of 80% of the cases

    - don't get lost in special cases

- What things waste your time?

- What are you angry about?

- What makes a good work day? A bad one?

- If you had a wish?

- What would change, if the wish became true? Who would notice it how?

- Use scaling (on a scale from 0..10 ...) or ordering (top 3 features, put into an order ...) questions.

- Ask for commitment/investment -- if you just ask, do you like to have, you get a yes.

Follow the funnel technique and start broad and get more specific later on. The interview is about research and to learn something unexpected open questions are the key to success.
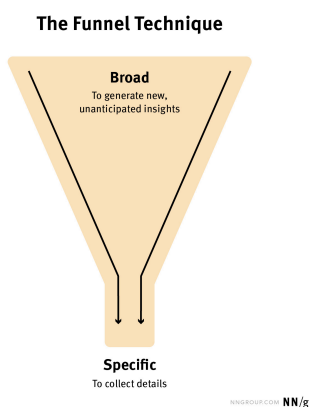
Funnel Technique
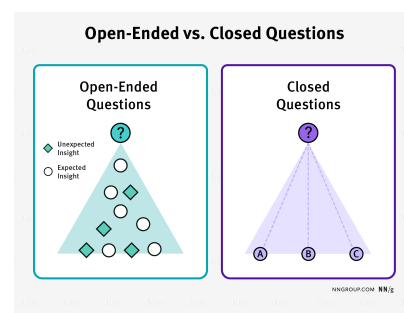
Open-Ended vs. Closed Questions

> ⚠️ **Pilot Test**
>
> Before you contact real users make sure to probe your interview in a **pilot test**.

Document and summarize your findings of your user research.

8.3.3 Persona

Take everything you learned so far and describe 2 to 5 personas for your product.

> ✏️ **Cite**
>
> A persona is a **fictional, yet realistic, description of a typical or target user** of the product. It is used to promote empathy, increase awareness and memorability of target users, prioritize features, and inform design decisions. The following resources define personas in depth and compare personas to other related artifacts. [4]

There are different templates for personas. Take the one, that suits you best. It should have a picture and contain pain-points and needs, and your user criteria. The persona should be useful to emphasize with the person while designing and developing the product.

LEAH

AGE: 22
LIFE STAGE: SENIOR IN COLLEGE WHO LIVES ALONE WITH HER DOG

"BEING ABLE TO HAVE MY DOG WHILE I GO TO SCHOOL AND ONLY WORK PART-TIME MEANS EVERYTHING TO ME."

MOTIVATORS:

HER DOG - Her schedule revolves largely around her dog, he is the constant and biggest support system in her day to day life.
INDEPENDENCE - She enjoys doing things on her own and creating her own schedule that is not entirely dependent on another's.
**HER CAREER -** She is fully committed to advancing her career in any way she can. In working part-time in her field of study while obtaining a Bachelor's Degree she hopes to appear both educated and experienced for her dream job.

USE FOR THIS WEBSITE:

• Seeking services she can utilize as a person of low income and in need of applying for help.
• Monitoring the food distribution locations.

ALICIA

AGE: 26
LIFE STAGE: AMBITIOUS VET GRADUATE
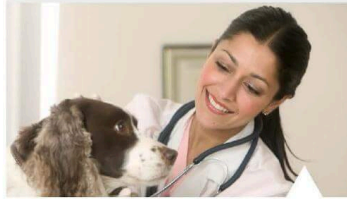
"HELPING ANIMALS IS WHAT I WENT TO SCHOOL FOR AND I'M REWARDED EVERYDAY FOR IT"

MOTIVATORS:

HER CAREER - She works long hours not because of the money but for the deep connection she has with her animal patients - she wants them to be happy and healthy.
HELPING OTHERS - She feels a stronger connection to people through their pets and understands the value of a relationship a pet owner has with their pet.
WELFARE OF ANIMALS & PEOPLE - On weekends she volunteers as a vet so she can provide care for pet owners who are struggling to afford veterinarian care.

USE FOR THIS WEBSITE:

• Keeping track of her schedule for upcoming clinics she needs to attend.
• Reviewing the FAQ's for Vets page for common concerns from pet owners that she hopefully can resolve.

DARREN

AGE: 40
LIFE STAGE: RECENTLY MOVED AND ENJOYS FOSTERING RESCUE ANIMALS

"COMING HOME AFTER A LONG DAY TO SEE I AM DOING SOMETHING GOOD FOR THESE ANIMALS GIVES ME A SENSE OF PURPOSE"

MOTIVATORS:

HIS SONS - He strives to be a good example to his sons and is motivated to encourage them to do their very best.
ACCEPTANCE - Since he never felt satisfaction from neglecting college, he relies on fostering rescue animals to give him a sense of doing something for the greater good within the community.
SENSE OF PURPOSE - His goal is to be remembered as someone who was selfless and to be viewed as admirable in his place within society - even if it is a small place.

USE FOR THIS WEBSITE:

• Checking the site for newly surrendered pets at the shelter.
• Keeping in communication with the staff of the shelter regarding animals he is fostering.

Persona Examples

Example for a persona [^2]

8.3.4 Scenario

Now, you may be able to put your persona into a context and describe, how your app might help the user with a specific problem. Here are two different types of scenarios. Choose the one, which suits you best.

The first example is from Scenario Mapping: Design Ideation Using Personas

Debbie is going on a business trip. She needs to book a hotel room that's affordable and has good reviews. Debbie browses the site to find a hotel for her upcoming trip. She looks closely at the various hotels to find one that meets her needs. She considers price and user ratings heavily as she shops. Debbie selects a hotel and books a room.

Actor	*Detailed Debbie*
Motivator	*is going on a business trip.*
Intention	*She needs to book a hotel room that's affordable and has good reviews.*
Action	*Debbie browses the site to find a hotel for her upcoming trip. She looks closely at the various hotels to find one that meets her needs.*

Resolution	*Debbie selects a hotel and books a room.*

And the second example is from The Sophist: Szenarien

"Lina returns home late in the evening from work. On her way, she was shopping and has both hands full of shopping bags. Since it is already dark, the smart home system detects the movements and turns on the outdoor lighting. As Lina approaches the house, the smart home system recognizes her as an authorized person and unlocks the door. Lina only needs to push the door open and can enter the house."

> **? Question**
>
> 1. What is a stakeholder?
>
> 2. What is shadowing, and when may you use it in a project?
>
> 3. State 4 arguments, why user research is important.
>
> 4. Formulate a hypothesis and a matching question to falsify or validate this hypothesis.
>
> 5. What is a scenario?
>
> 6. Will you need one scenario only for the complete app?

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1. Kate Moran and Maria Rosala. When to use context methods: field and diary studies. 2021. URL: https://www.nngroup.com/articles/context-methods-field-diary-studies/ (visited on 15.02.2024). ↵

2. Christopher Reid Becker. *Learn human-computer interaction: Solve human problems and focus on rapid prototyping and validating solutions through user testing*. Packt, Birmingham and Mumbai, 2020. ISBN 9781838820329. URL: https://learning.oreilly.com/library/view/learn-human-computer-interaction/9781838820329/. ↵

3. Kara Pernice and Maria Rosala. User interviews 101. 2023. URL: https://www.nngroup.com/articles/user-interviews/ (visited on 12.02.2024). ↵

4. Kate Kaplan. Personas: study guide. 2022. URL: https://www.nngroup.com/articles/personas-study-guide/ (visited on 12.02.2024). ↵