User interview with a Robbie

Meeting Tags	User Interviews
Date	
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Participants	

Research Questions

- Is the presented prototype easy to understand of what you can do to control our device?
- Does the terminology make sense?
- Is everything that we provide sufficient enough to record experiments with it?
- Which style should the application follow? (after presenting mood boards and colour schemes)

Interview Script

Introduction

- Doing a user interview, helps us to find out what and how we want to design things early in the creation of a new product
- We ask questions, not directly about you or to test you, but rather to gain insights for our design process
- If you don’t know how to answer a question let us know, we’re here to help you guide through the process, if you don’t want to answer a question that’s also fine, just let us know

Warm Up

- Tell us about yourself
    - What do you do as your job or hobby?

        - Go into more detail to ask about the context and connection to IDUN
        - Why doing research, what fascinated them?
    - What is the greatest pain at your current job/hobby? OR with what the person has mentioned in context and connection to IDUN?
        - Go more into detail and find out the WHY
    - What are you currently researching if they’re allowed to talk about it?
- Have you heard of brain-machine interfaces – what is a brain-machine interface?
    - Can you describe what a brain-machine interface is and how it works?
    - Have you ever worked with or thought of working with a brain-machine interface?
    - Do you have a research use case in research for a brain-machine interface?
- Have you worked with EEG before?
    - If yes, which systems from which brands?
    - What was the best EEG system you worked with and why?
    - What was the worst EEG system you worked with and why?
- Do you know the benefits of a mobile EEG system?
- What do you think is a benefit of an in-ear EEG system that is fully mobile?

Context

At IDUN, we are building an EEG system that can read your brain's signals in real time. We are not the first to do this, others have been doing it for many decades. The difference between our product and others on the market is the form factor. Our EEG device is the size and shape of a normal in-ear headphone such as Apple Airpods. Compared to e.g. a state of the art system in 2022 our device has similar signal qualities and impedance values in a form-factor which has the potential to be mainstream and the setup speed that is not comparable to any other EEG systems as of today (show some charts).

Our goal is not to develop the headphones themselves (building the brand, marketing, packaging design, etc.), but to integrate our technology (hardware as well as software) into existing headphones. And why? Because we want to be able to incorporate a fully mobile, unobtrusive and therefore mainstream-ready EEG sensor

in a form factor that allows hours of measurements during everyday activities. No laboratory environment or special setup is required. Developers and researchers should then be able to interact with the brain data, for example in the form of classified outputs via an API.

- **To give you some examples of what's possible and will soon be possible in the near future:**
  - The users general focus in a range from 1–10
  - The users tiredness in a range from 1–10
  - How long, well and in which stages the user slept
  - Where the user is looking at (top right, bottom left, centre up, centre down etc.)
  - If the user is squeezing their eyes together or not or blinking and how long is blinking
  - If the user is hearing sounds in certain frequencies or what for profiles the user is able to hear
  - If the user is eating something, talking or chewing something hard of soft
  - If the user is hungry, tired, asleep, bored etc.
  - Raw data or filtered data that removes artefacts automatically already in real-time
- More things will be possible soon. Before we continue we want to hear how you feel when you hear what's possible with our device?
- Do you have any concerns about our device and application?
- We will give you two examples of what is possible to build with our device:
  - A music app that recommends music based on your mood: if you're tired it will show you two auto-generated playlists; one that makes you more awake and one that helps you fall asleep. Same with being focus, bored etc. You can replace the music playlist with basically any recommendation engine you could think of. (show example slides)
  - Another more complex idea: A user is wearing a AR/VR device and you track where the user is looking at in the 3D world and based on the focal point of the users attention you increase the volume of the source and

decrease surrounding sounds (also known as the cocktail party effect). (show example slides)

- What are your thoughts when you heard these two ideas?
  - Ask more questions so that the user elaborates
- Next to using our app for creating applications it should also enable researchers to setup and record experiments, possibly experiments that need to be recorded outside of the lab. here is where your experience comes into play.
- How do you proceed when you create your own experiment?
  - Here is an example experiment: Resting state experiment: person looks at a cross and does nothing for one minute, to find out if you can identify some brain health related diseases or just to measure activity in different brain regions under resting conditions. OR oddball paradigm – How would you proceed to create such an experiment?
    - What tools (hardware and software) are you using?
      - Why are you using these tools?
    - What software are you using? Why are you using this software?
    - What are pain points of these tools etc?

- What are you doing after you recorded the data set of one experiment/one participant? Let us walk through it.
  - How are you ensuring the data quality of the recorded data?
  - How are you visualising the data? MATLAB, Excel, some other tool?
  - How are you processing (pre-, post-) the recorded data?
  - What are pain points in that process?
  - Why are you using these tools?
  - What tools are amazing to help you in that regard?
    - Where are you creating your own tool?
  - Where did you learn these tools, softwares etc?
  - Where are you storing that data?

        - How do you ensure user privacy and data protection for the recorded data?
        - How do you collect the consent for the recorded data from the participants?

Competitors/Examples

- Can you describe the best app for an EEG system that you've used before?
    - Can you describe why this example is amazing and what they're making differently?
- Can you describe the worst app for an EEG system that you've used before?
    - Can you describe why this example is bad and what they're making badly?
- What is the most complex EEG system or lab recording system that you've ever used?
    - Let the user elaborate
- Did you ever create code snippets on your own for experiments in a lab?
    - Let the user elaborate
    - **dig more into them**
    - how did you learn these things? course, bootcamp etc?

Prototype

We have designed a prototype of this web app to help people that want to use our device without the need to code/program. our aim is an easy-to-understand graphical user interface that helps people to understand how the device works, control the device and to record data/experiments. We want you to let it go through. We don't want you to break anything, and keep in mind that this is a prototype that is not 100% finished or thought through. If you have a question or something is unclear, let us know. We encourage you to think out loud about what you are thinking as you go through the prototype. We have a few exercises for you to conduct and would like to go through them now.

These are the exercises:

- You bought a new device and want to use it for a simple audio stimuli recording, so letting various people ranging of different ages listen to a 40 Hz and a 90 Hz sound to see what the differences in neural responses are in terms of age. For that you need to register a newly bought pair of headphones on the web app's platform. Can you do that for us in the prototype?
- Now that you registered the device you want to quickly test if it works and if brain data goes through, so you want something like a livestream.
- Now that you're looking at the livestream you want to know if the quality is good of the device, so e.g. if the earphone sits correctly in the ear.
- Now in order to record a simple experiment with a possible test subject you want to create a 10 seconds recording and then have a look at the data afterwards. Can you do that for us?
    - Please now access the eye movement data
    - Now you want to visualise the data, how would you do that?
    - Now you want to download the data, how would you do that?
    - What would you usually do after you downloaded such data? What are the tools you're working in?
        - What are pain points or limitations of these tools you work in after downloading such data?
- Now you want to setup a recording template for the hearing threshold experiment that you can reuse with other people. You also want to be able to upload sounds that can be played during the experiments at certain points. How would you do that?
    - What do you think is very important for creating such recording data sets?
        - Mention maybe markers, timestamps, time synchronisation etc.
- Now you recorded 20 experiments with 20 participants. you also always recorded the pulse rate of the recorded people and want to compare them with the recorded brain data.
    - How would you normally proceed in a situation like this?
    - Did you know that you can also upload other data sets such as videos, heart rate etc. to our platform to easily visually compare them? Can you do that for us please.

Style and Moodboard

Thank you so much for helping us understand how your mind works. In order to conclude the design questions we present you with a few example designs and moodboards from other apps and/or competitors and you need to chose your favourites. Please keep in mind that we encourage you to think out aloud.

Conclusion

Thanks a lot for participating in our user interview session. You were very helpful and provided us with a lot of interesting insights. We will keep the provided information from you private and we will delete the recorded files in the next two weeks. You don’t need to do anything anymore. Do you have any questions?