

ECHO MARKS

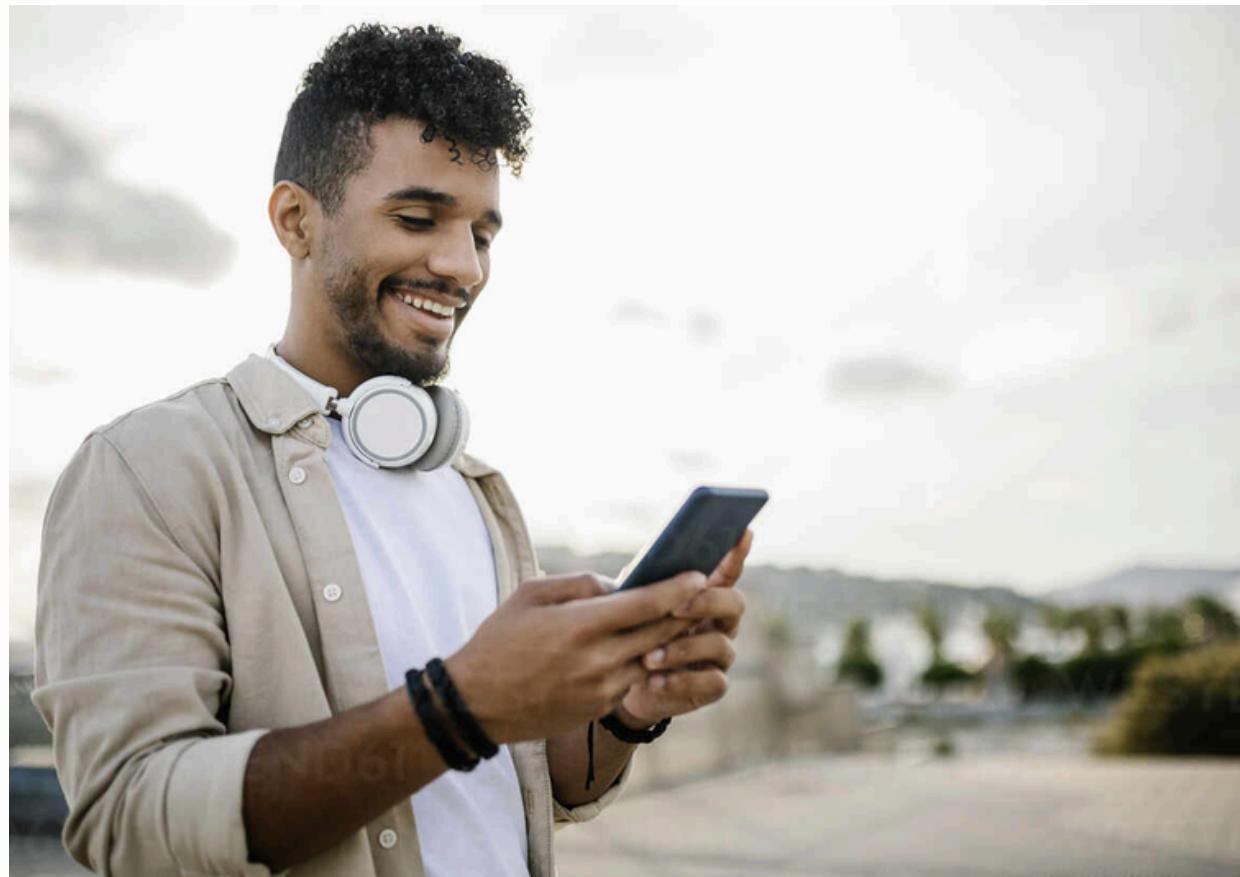
A SONIC THINKING PROJECT



PROJECT INFORMATION

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Study Programm	IT-Systems Engineering
Institute	HPI

TODAYS COMMUNICATION



People are able to send and receive messages at every moment.

Messengers, Social Media and other Communication Technologies connect us strongly to people all over the globe...





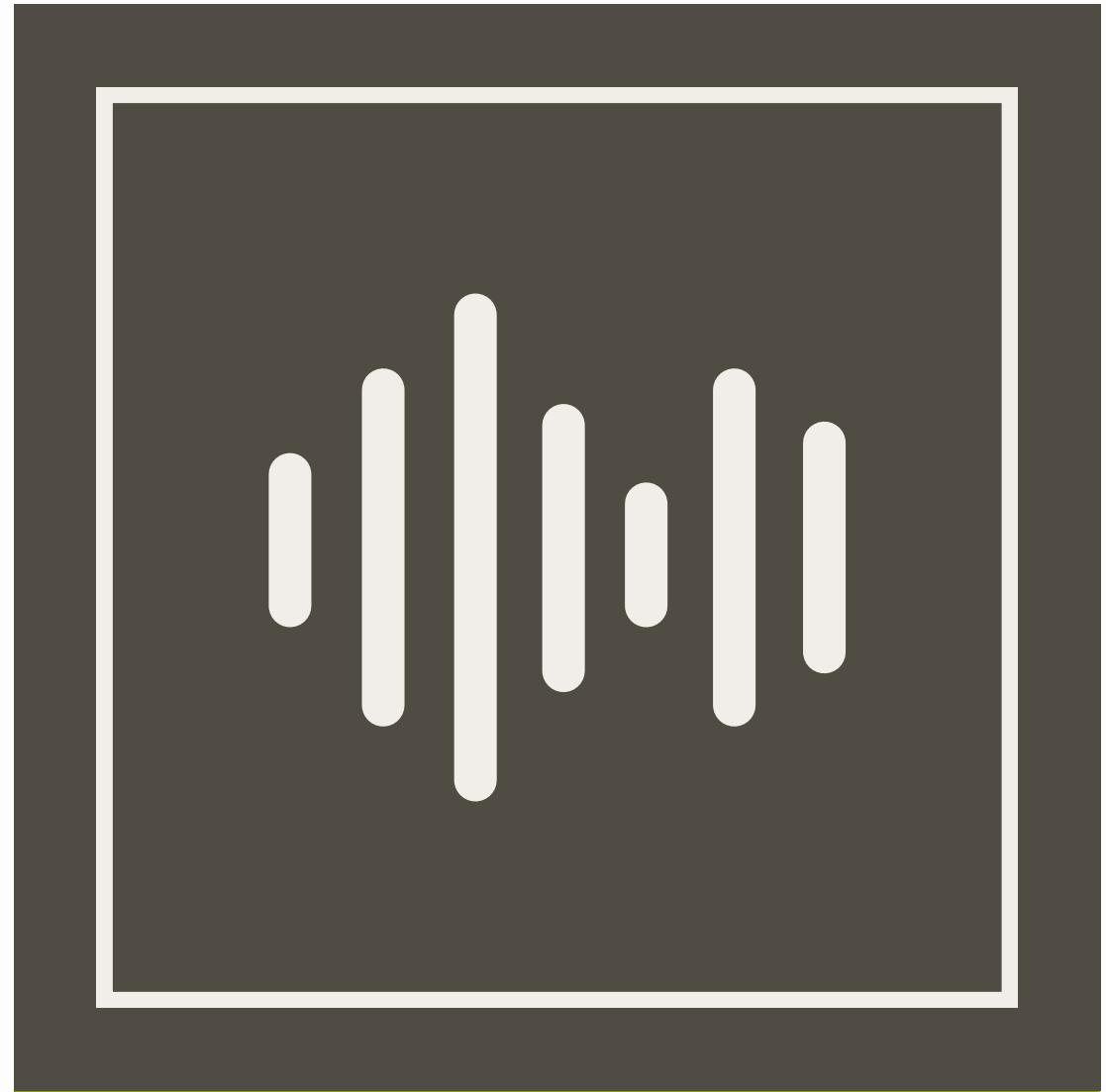
... but modern communication also has many negative side effects.
It is **addictive** and **distances people** from the world around them.

Although communication is now ever-present, it is also becoming increasingly **impersonal**

RESEARCH QUESTION

How can we use technology to bring people closer together without distancing ourselves from the world around us?





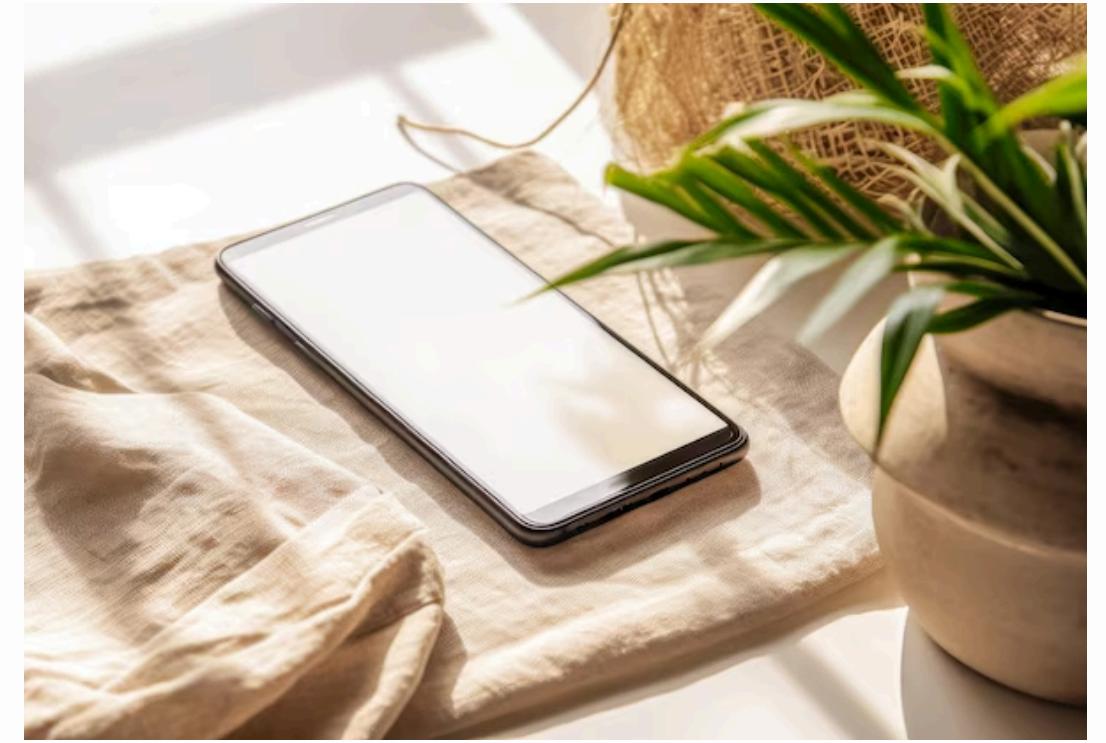
THE IDEA OF ECHO MARKS

Enable people to leave an echo of themselves wherever they go, that can later be discovered by another person.

Think of it as people pinning audio sticky notes to a digital space.

IMPLEMENTATION

The Idea will be implemented as an App. That allows users that carry a smartphone to leave and listen to echos wherever and whenever they want. The App will need the following features:



Creation of Echos

- create sound file
- set location
(default to user location)
- set recipient
(single person, group or public)
- toggle visibility on map

Playback of Echos

- notify user when at echo location
- play echo (autoplay or manual)

Map

- display user location
- display echo locations

USE CASES



WHAT IS THE BENEFIT?

Environment of Messages

Messages are received in context to the environment

- Adds a layer of meaning to the message
- Connects people with the world around them

No Rush

Asynchronous communication takes out the rush

- Single Messages get more meaning
- No “Need to answer”

No constant Notifications

There are no notifications from the app if you don't move

- No need to check smartphone regularly
- Reduces the addictive effect of media



Sense of Connection

Feeling of Connection to people in your area

- Public Messages create a community
- Echos are a link through time to people that have been at the same place before

Discovery

Aspect of discovering a message adds a positive thrill

Speech

Messages get more personal through speech

RELATED APPS: TRACES

Traces lets users leave digital gifts (e.g. videos) at physical locations for their friends to pick up. A trace leads the friend to the gift via augmented reality.

“It allows the brain to embody the world around it unlike other apps that make the brain inhabit the phone without a sense of location.” [1]

Difference to Echo Marks:

- Is build like a treasure hunt
- Not made for casual communication
- No hidden messages

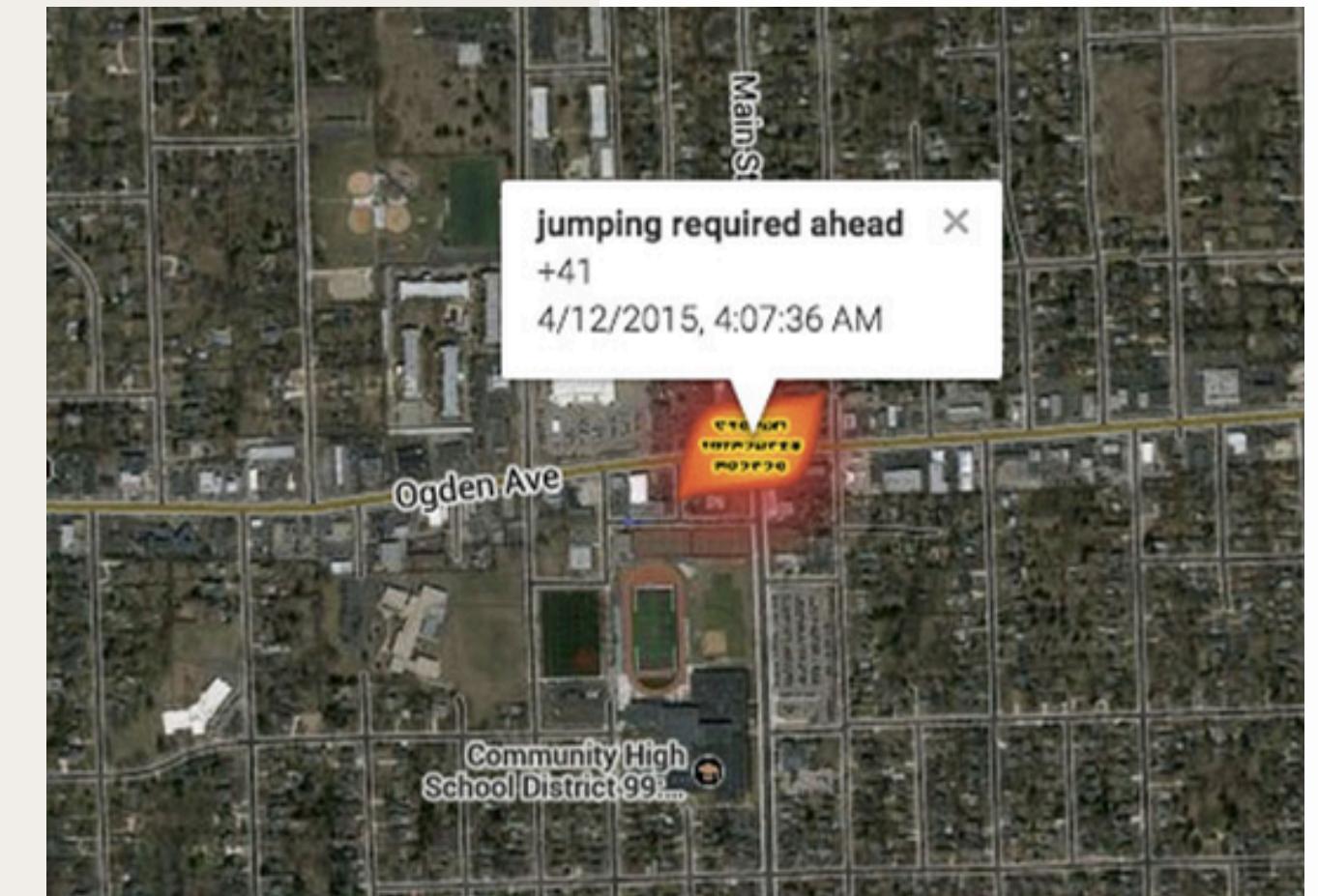


RELATED APPS: SOAPSTONE

Soapstone is an app inspired by DarkSouls. It allows users to leave game-like posts at their current location, which can be viewed and rated by other users. [2]

Difference to Echo Marks:

- Messages are posts like
- Very game-like
- Not made for casual communication
- No audio messages



REALTED RESEARCH

Studies that asses the addictiveness of Social Media and negative effects like loneliness, lack of sleep and even depression resulting from that

Is generation Y addicted to social media [3]

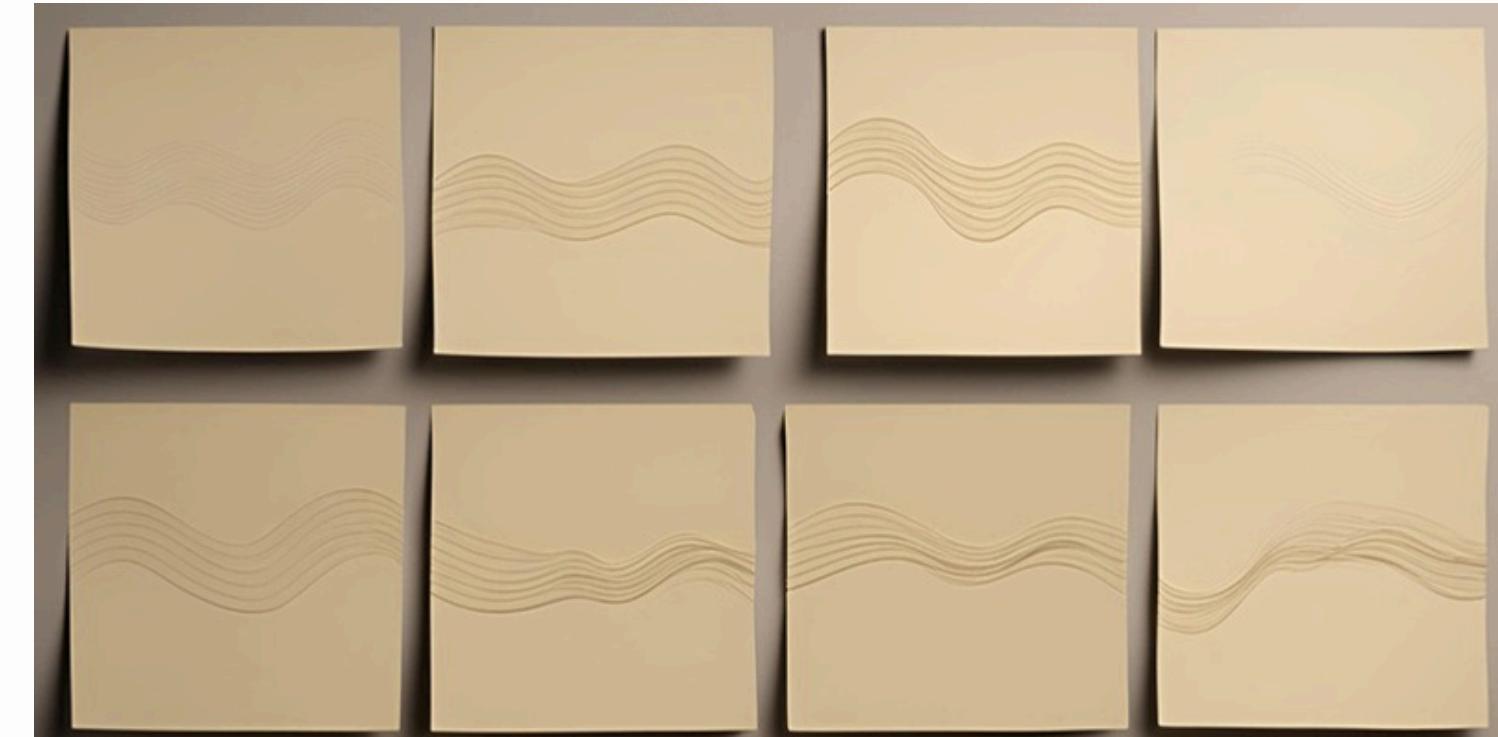
Internet Addiction Prevalence and Quality of (Real) Life: A Meta-Analysis of 31 Nations Across Seven World Regions [4]

The Relationship Between Depression and Internet Addiction [5]

Internet Addiction in Students: A Cause of Concern [6]

Test ways to reduce addictivity of Social Media e.g. through “Pause Reminders” or hiding of notifications

Designing for Digital Detox: Making Social Media Less Addictive with Digital Nudges [7]



Approaches to using augmentative reality to bridge the gap between real and digital space and connect people more closely with each other and the environment

WikiTUI: leaving digital traces in physical books [8]

Tangible bits: towards seamless interfaces between people, bits and atoms. [9]

The Application of Augmented Reality Visual Communication in Network Teaching. [10]

A meta-analysis of the effects of augmented reality technologies in interactive learning environments (2012–2022)[11]

TECHNOLOGIES

This is the first time I am creating an app.

Therefore, I am not sure about my choice of technologies and will adjust them if necessary



Frontend

TypeScript
React

Map/Locations

React Native Maps
Expo Location

Audio

React Native Audio Recorder Player



GOAL

Create MVP with the following features:

- Create audio file linked to specific location
- Display audio file on map
- Enable user to play audio file
- Notify when user is at location of audio file
- Audio file only accessible when at right location
- Address messages to groups/individuals/public
- Configurations like autoplay and visibility on map

This Semester

When there is extra time

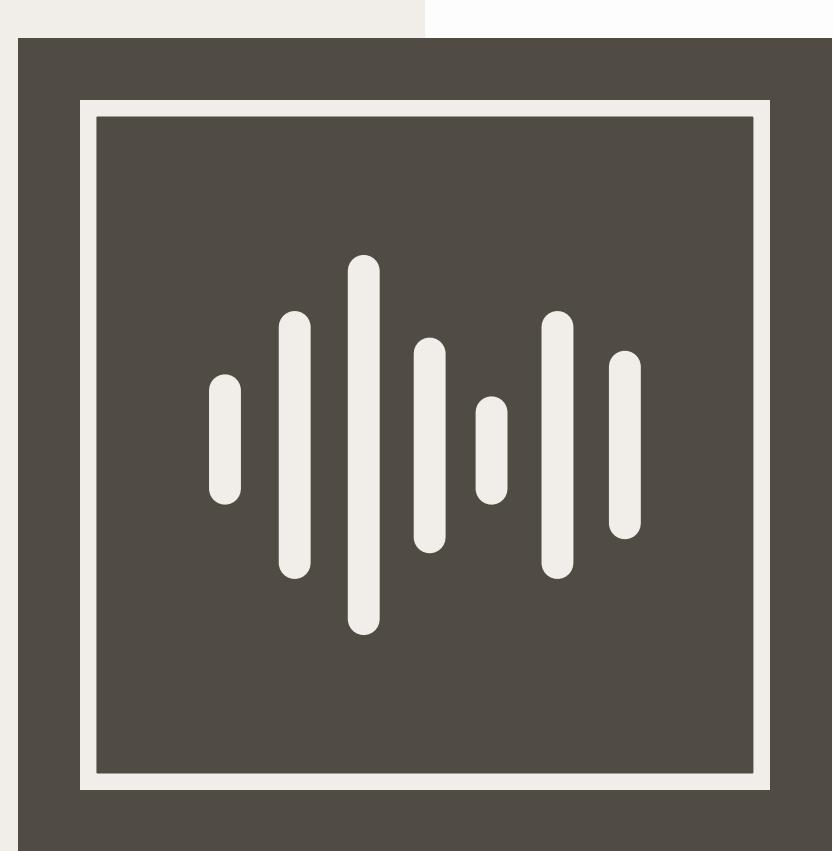
EVALUATION OF PROTOTYPE

1. Create a working Prototype
2. Get a small sample group to test the App
3. Go through a questionnaire with the participants to evaluate the prototype:
 - a. How did the app affect your communication?
 - b. How did you perceive the messages you found?
 - c. In what situations did you want to leave a message?
 - d. ...
4. Evaluate Echo Marks in regard to the research question



ECHO MARKS

How can we use technology to bring people closer together without distancing ourselves from the world around us?



REFERENCES

[1] <https://www.appstud.com/traces-the-new-messaging-app/>

[2] <https://play.google.com/store/apps/details?id=us.flexswag.soapstoneorange&hl=de&gl=US&pli=1>

[3] Cabral, Jaclyn. "Is generation Y addicted to social media." *The Elon Journal of Undergraduate Research in Communications* 2.1 (2011): 5-14.

[4] Cheng, Cecilia, and Angel Yee-lam Li. "Internet addiction prevalence and quality of (real) life: A meta-analysis of 31 nations across seven world regions." *Cyberpsychology, behavior, and social networking* 17.12 (2014): 755-760.

[5] Young, Kimberly S., and Robert C. Rogers. "The relationship between depression and Internet addiction." *Cyberpsychology & behavior* 1.1 (1998): 25-28.

[6] Nalwa, Kanwal, and Archana Preet Anand. "Internet addiction in students: A cause of concern." *Cyberpsychology & behavior* 6.6 (2003): 653-656.

[7] Purohit, Aditya Kumar, Louis Barclay, and Adrian Holzer. "Designing for digital detox: Making social media less addictive with digital nudges." *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*. 2020.

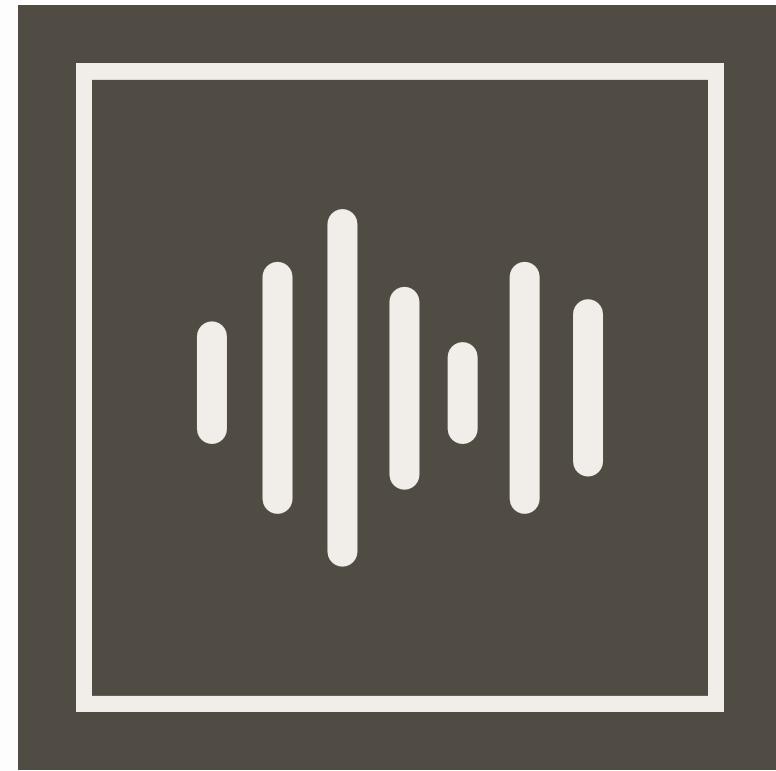


[8] Wu, Chih-Sung Andy, Susan J. Robinson, and Alexandra Mazalek. "WikiTUI: leaving digital traces in physical books." *Proceedings of the international conference on Advances in computer entertainment technology*. 2007.

[9] Ishii, Hiroshi, and Brygg Ullmer. "Tangible bits: towards seamless interfaces between people, bits and atoms." *Proceedings of the ACM SIGCHI Conference on Human factors in computing systems*. 1997.

[10] Zhao, Qian. "The Application of Augmented Reality Visual Communication in Network Teaching." *International Journal of Emerging Technologies in Learning* 13.7 (2018).

[11] Lin, Yupeng, and Zhonggen Yu. "A meta-analysis of the effects of augmented reality technologies in interactive learning environments (2012–2022)." *Computer Applications in Engineering Education* 31.4 (2023): 1111-1131.



ECHO MARKS

FINAL PRESENTATION

THE IDEA

The Problem

Messengers and Social Media can have a negative impact on mental health and distance people from the world around them [1],[2] .

The Research Question

How can we avoid that and use technology to bring people closer together?

The Hypothesis

Enable people to leave an echo wherever they go, allowing others to later listen to these traces. This will deepen their connection to each other and the world around them.



THE IMPLEMENTATION

Create an App that allows users to leave and listen to echos wherever and whenever they want.



Map

- display user location
- display echo locations

Creation of Echos

- create sound file
- set location
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- toggle visibility on map

Playback of Echos

- notify user when at echo location
- play echo when at location



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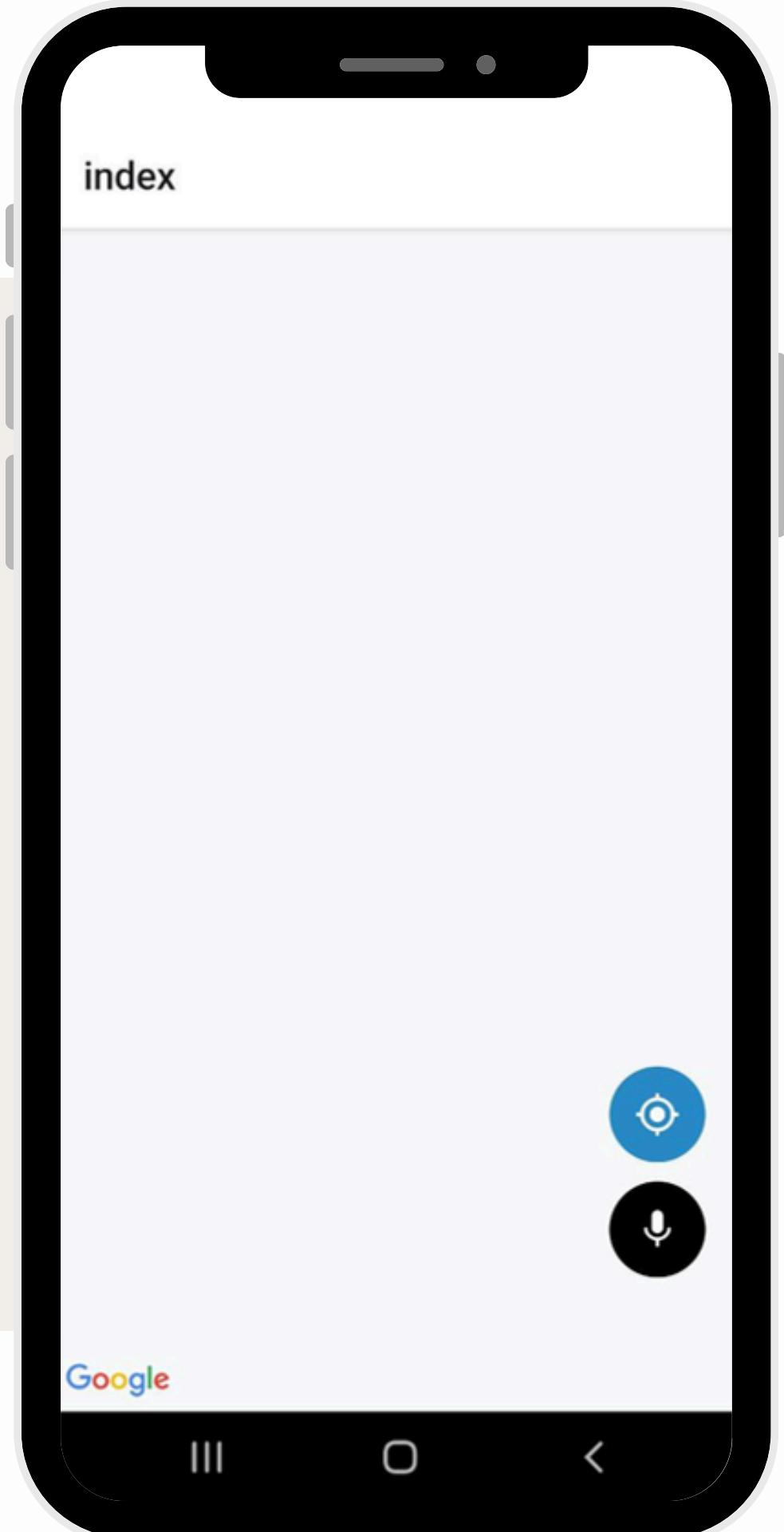
} This Semester

} When there is extra time

WHERE WE ARE AT

Create an App that allows users to leave and listen to echos wherever and whenever they want.

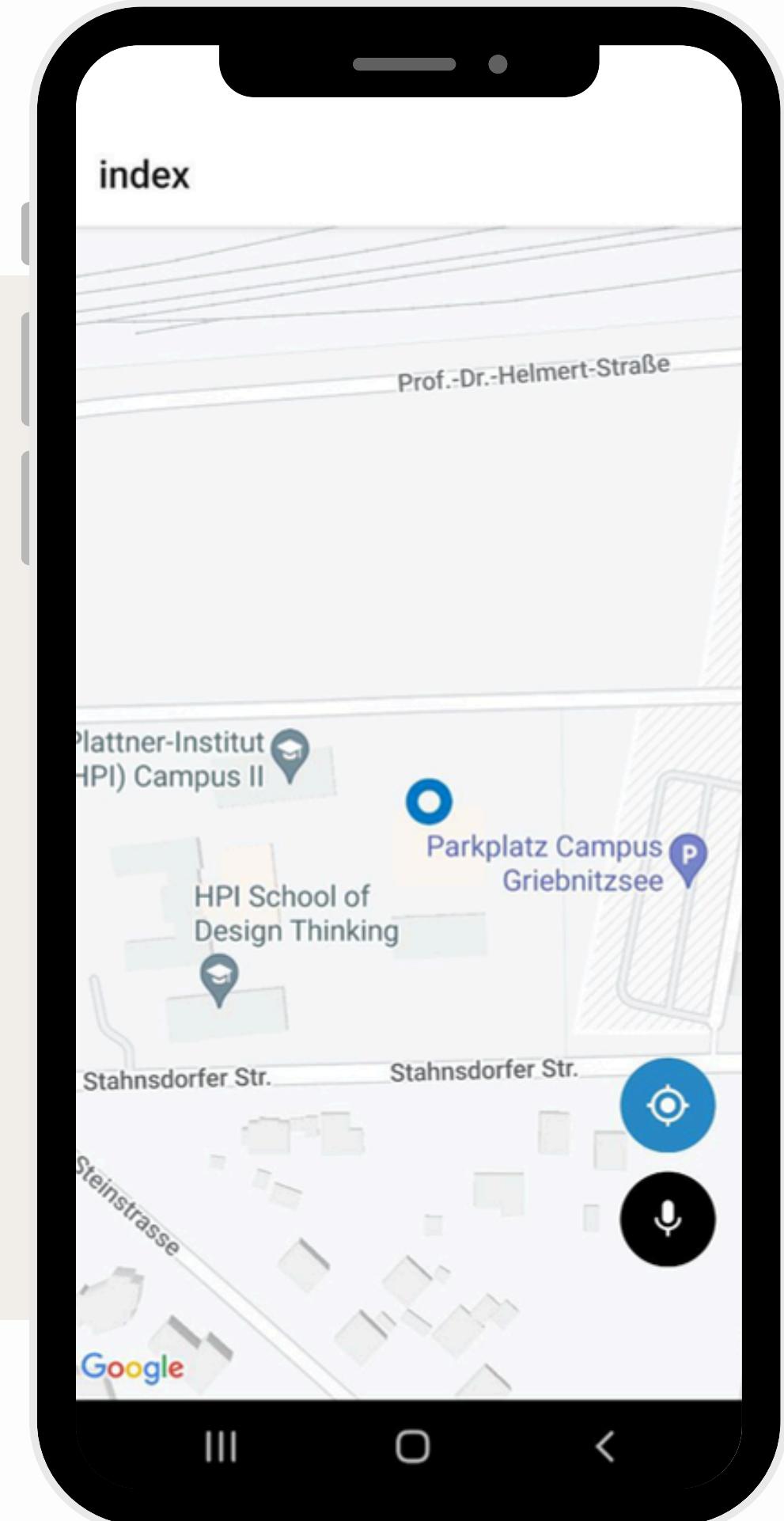
- Display Map
- Create audio file linked to specific location
- Display audio file on map
- Enable user to play audio file



WHERE WE ARE AT

Create an App that allows users to leave and listen to echos wherever and whenever they want.

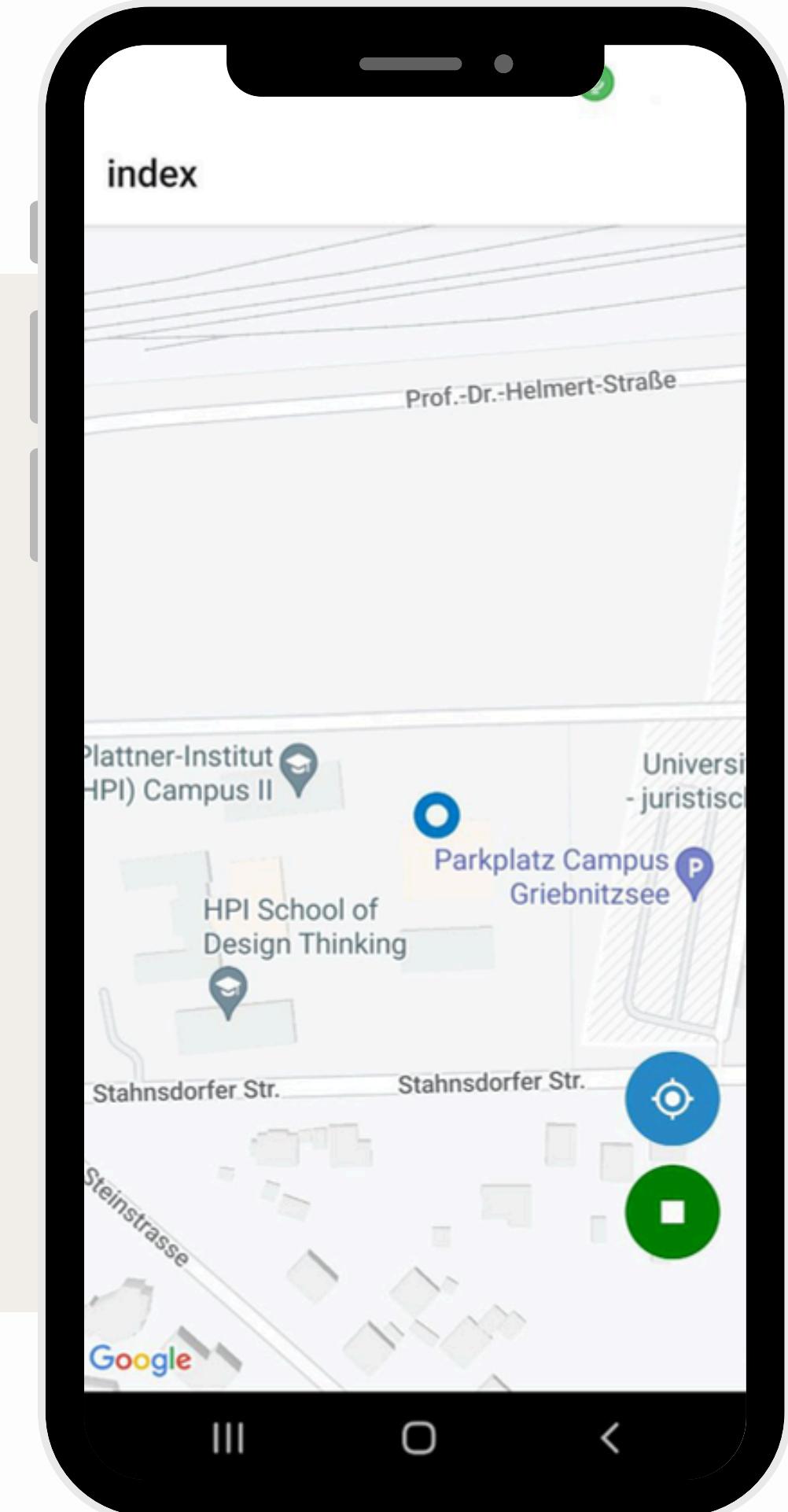
- **Display Map**
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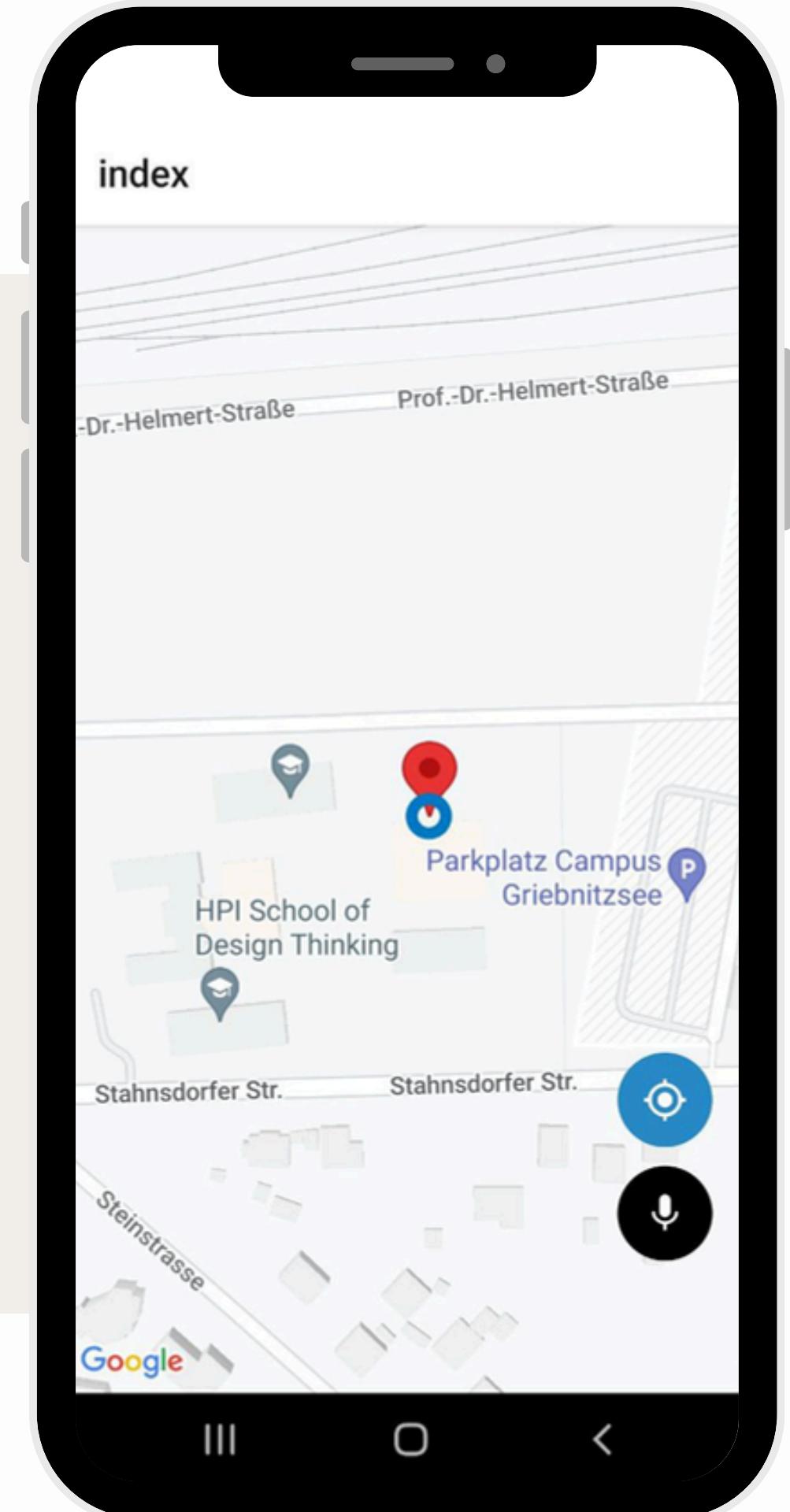
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WHERE WE ARE AT

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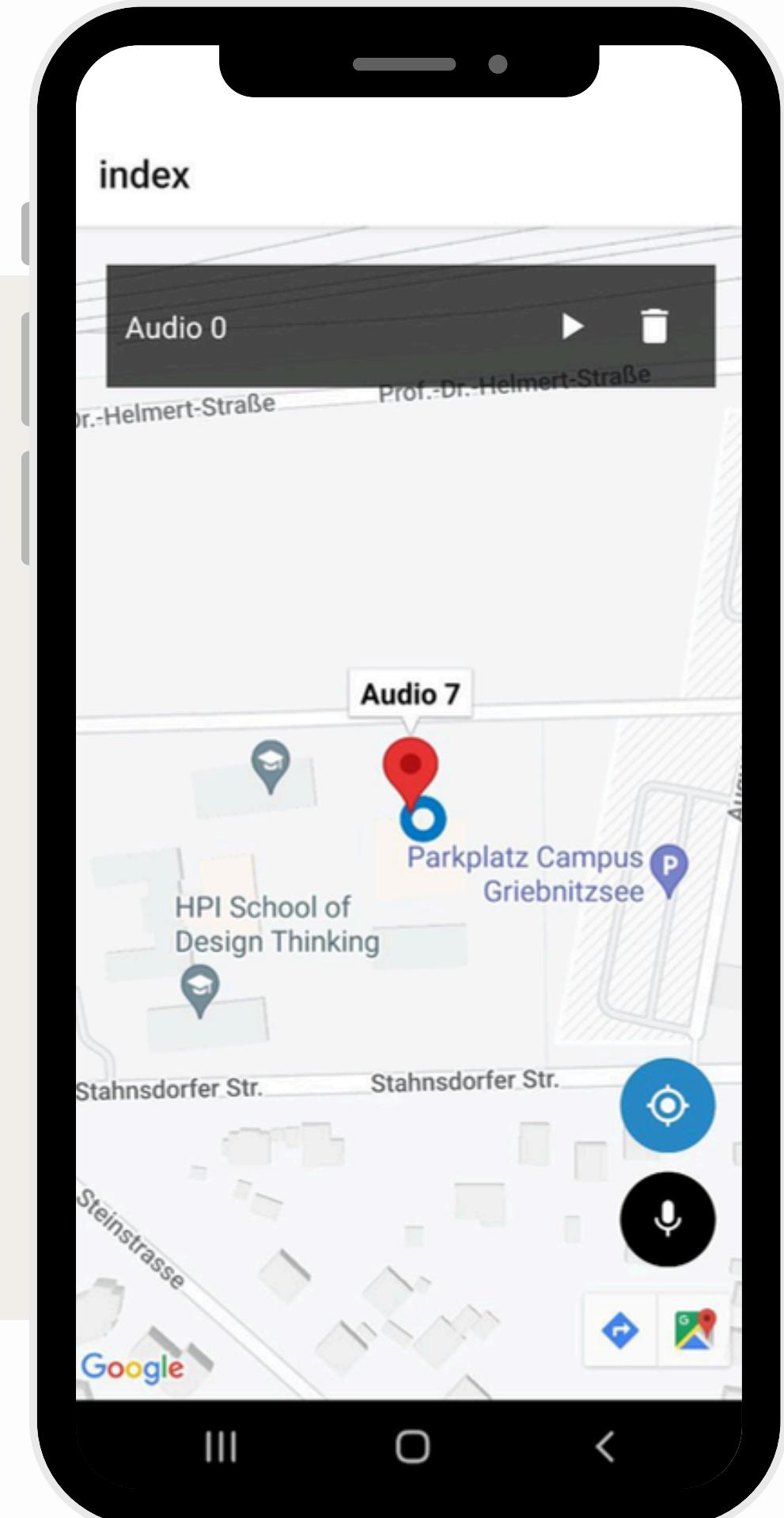
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WHERE WE ARE AT

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GOAL

Create MVP with the following features:

- **Display Map**
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- **Enable user to play audio file**

} This Semester





GOAL

Create MVP with the following features:

- **Display Map**
- **Create audio file linked to specific location**
- **Display audio file on map**
- **Enable user to play audio file**

- + **Delete audio file**
- + **Reset map to user location**

} This Semester

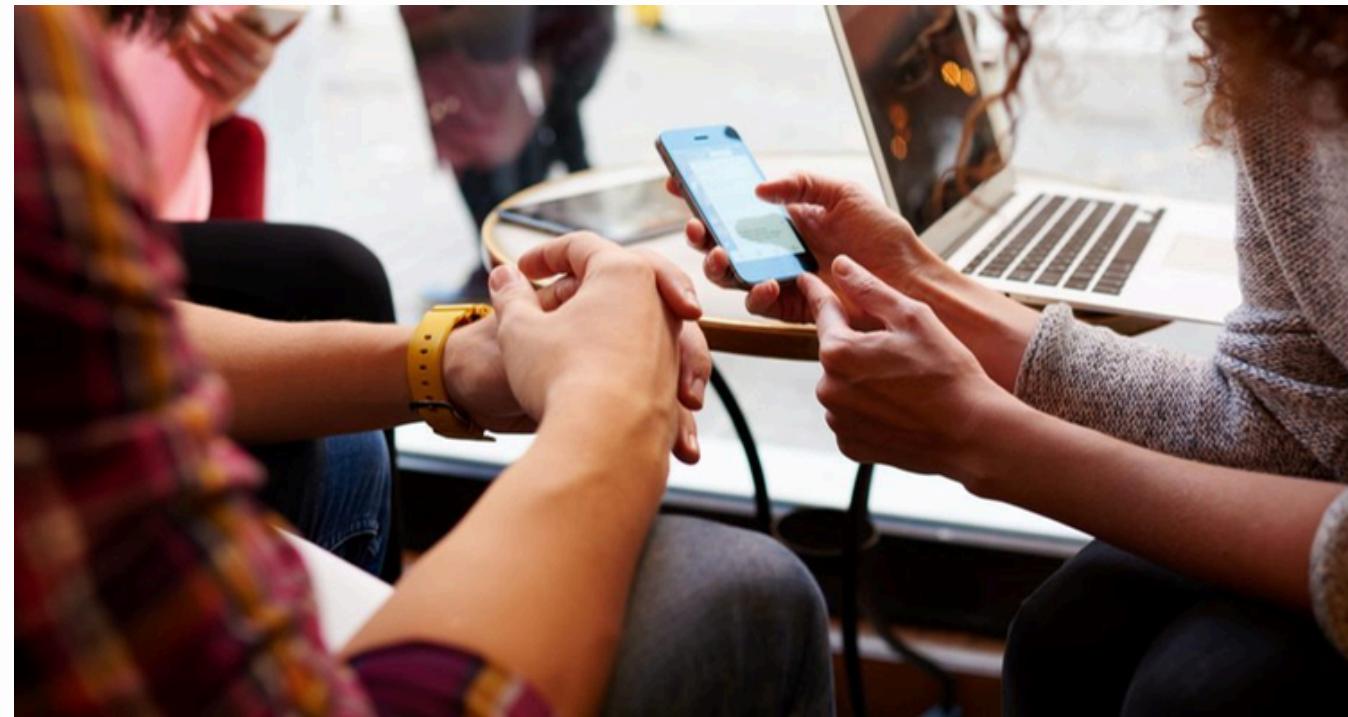


RESEARCH QUESTION

How can we use technology to bring people closer together without distancing ourselves from the world around us?



EVALUATING THE APP



- 01** Introduce a selected group of people to the Echo Marks application

- 02** Conduct a user survey with this group using a questionnaire

The screenshot shows a Google Forms survey titled "Echo Marks". The introduction text reads: "This questionnaire aims to evaluate Echo Marks, a prototype that enables users to leave and discover audio sticky notes attached to real-world locations. Your feedback will help understand how this technology impacts social connectivity and interaction with the environment. Your honest answers greatly support this research. Thank you for sharing your experiences!" The survey includes two main sections: "Age" and "Gender".

Age *

- Under 18
- 18-24
- 25-34
- 35 and above
- 45 and above

Gender *

- Female
- Male
- Non-binary

LIMITATIONS

As I undertook the development of the prototype alone, I couldn't incorporate all the features I had envisioned for the final product.

As a result, a complete evaluation is not yet feasible.



Missing Network Component

- Messages are device dependent
- Evaluation on effect of App on interpersonal relationships is limited

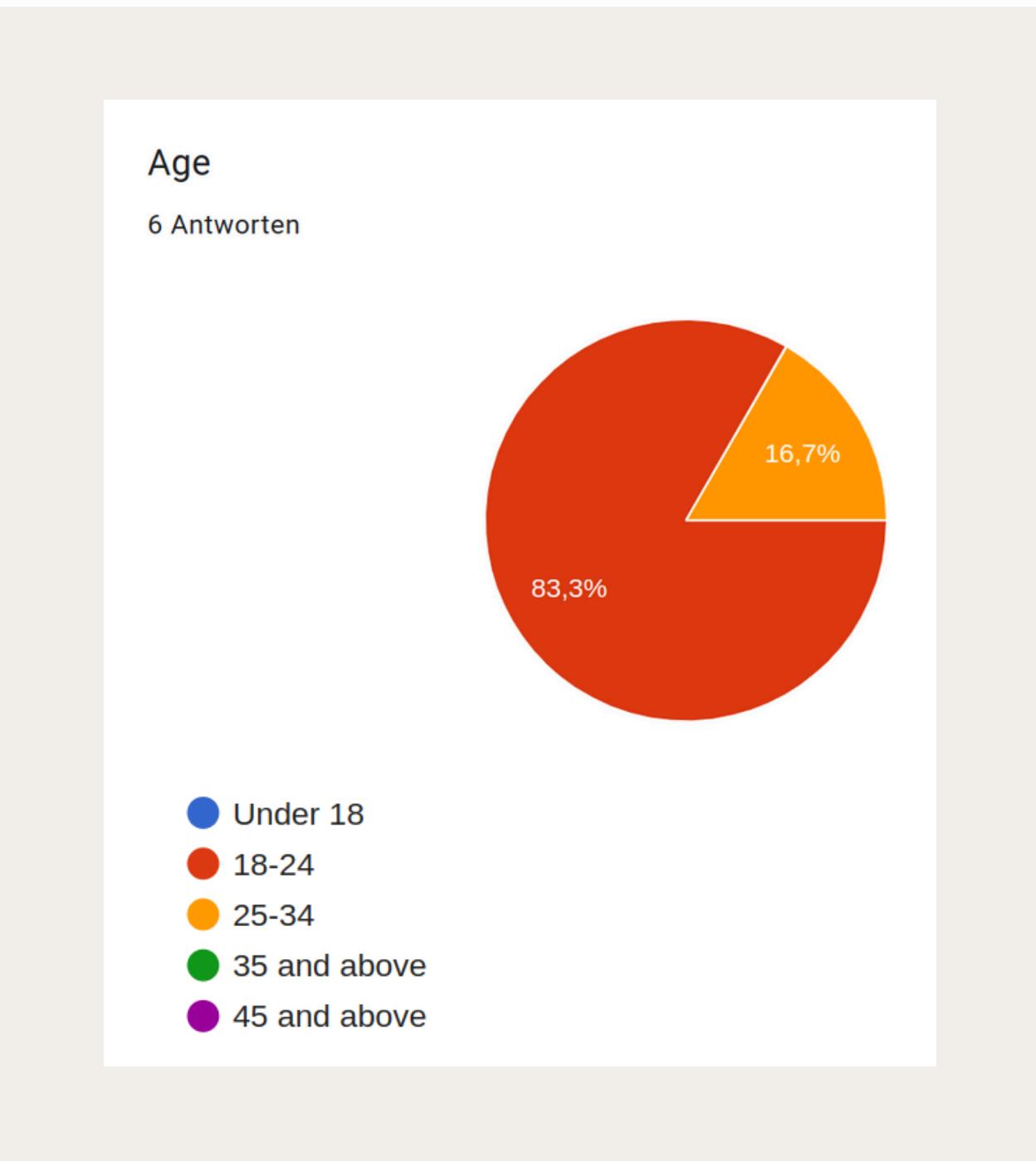
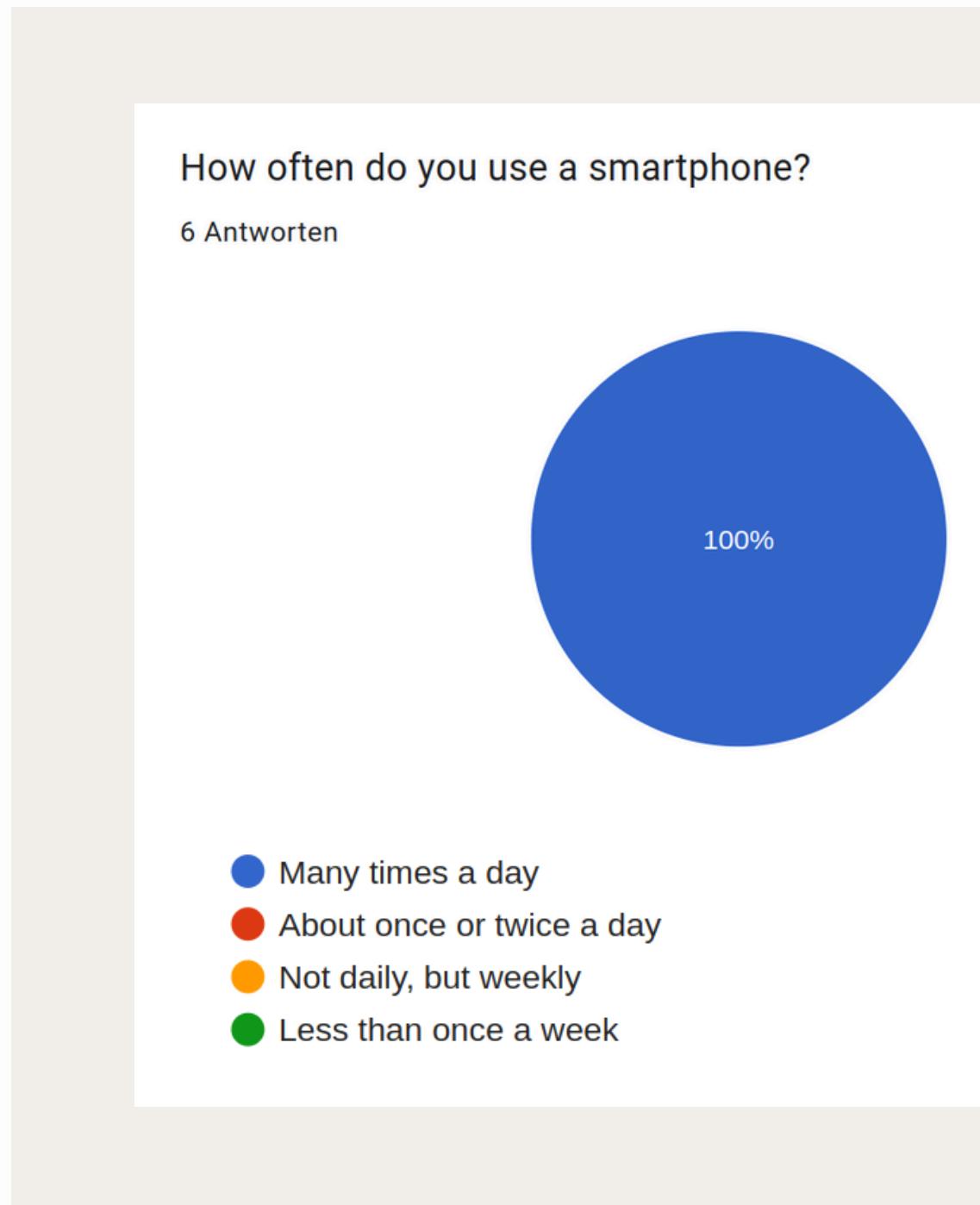
Playback Location Independent

- User doesn't need to be at the correct location
- Functionality has to be simulated
- Limits the user experience.

Subjective Evaluation

- No large-scale surveys
- Results remain subjective
- Lack of statistical significance
- Serve as indicator rather than definitive proof of concept

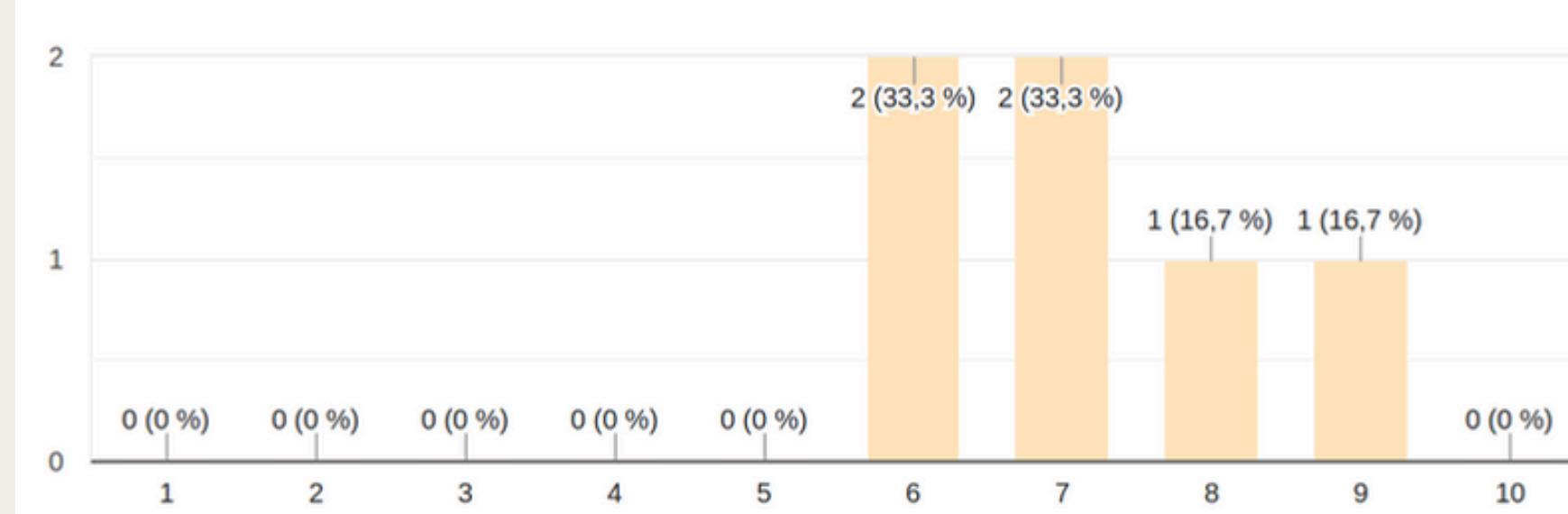
01 Limitations



02 Interpersonal Connection

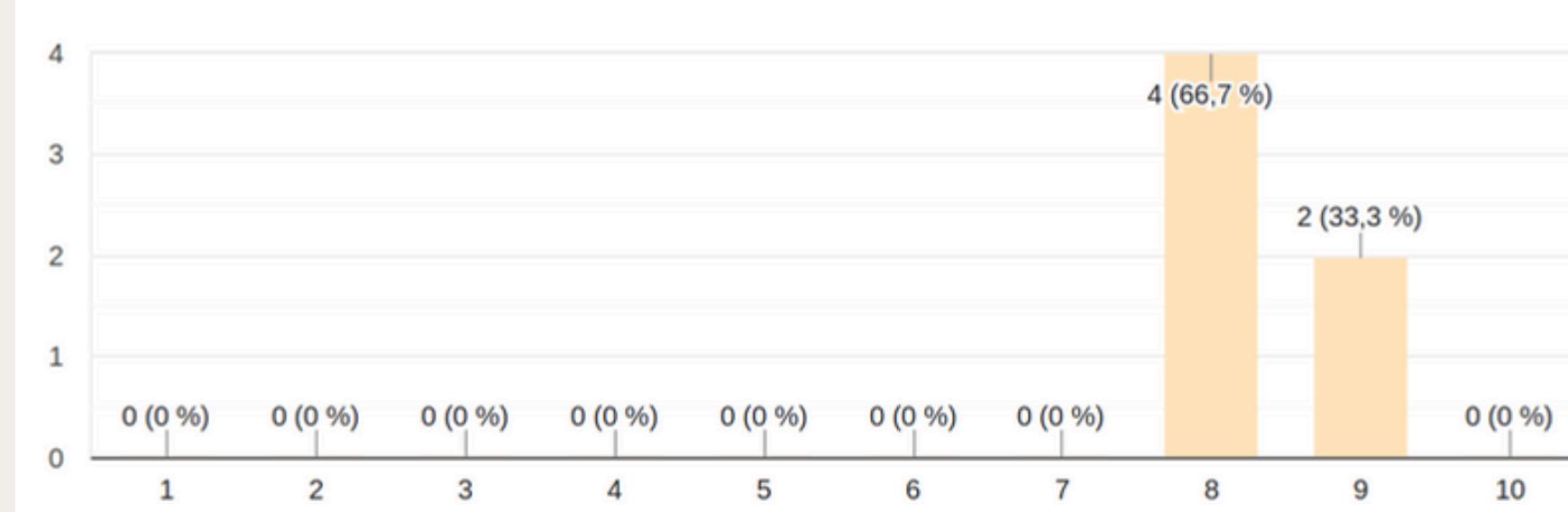
How did the placement of audio messages for others affect your sense of connection to them?
(compared to if you had texted them at that moment)

1: Strongly decreased connection
10: Strongly increased connection



How did the discovery of audio messages affect your sense of connection to the senders?
(compared to if you had received a text at that moment)

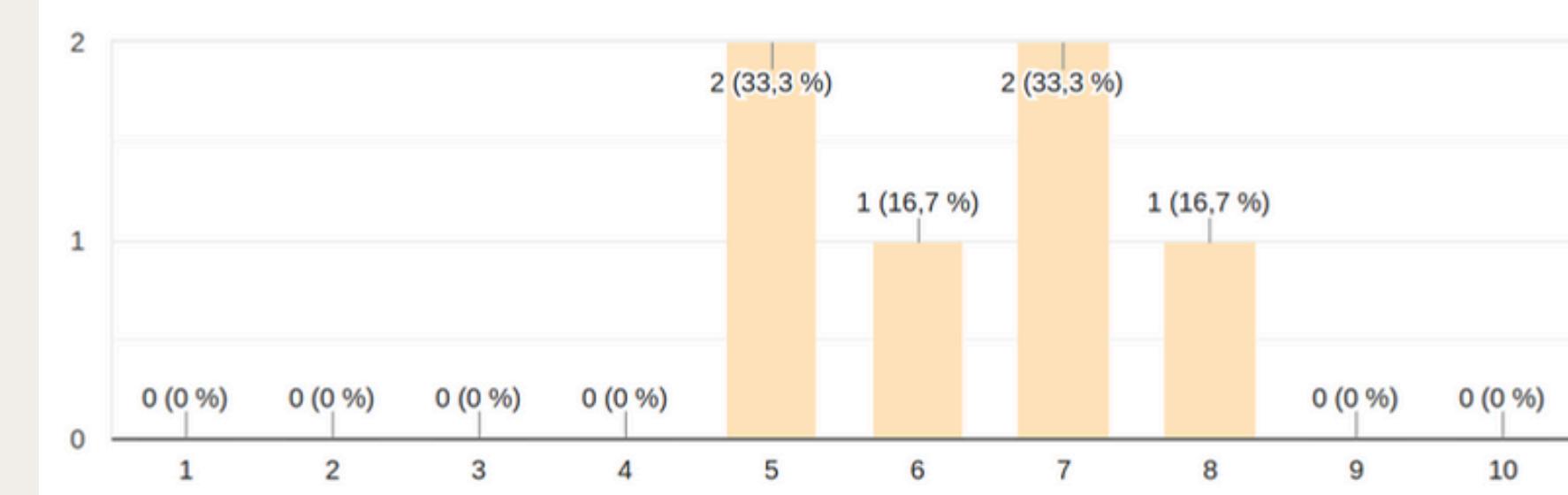
1: Strongly decreased connection
10: Strongly increased connection



03 Engagement with Environment

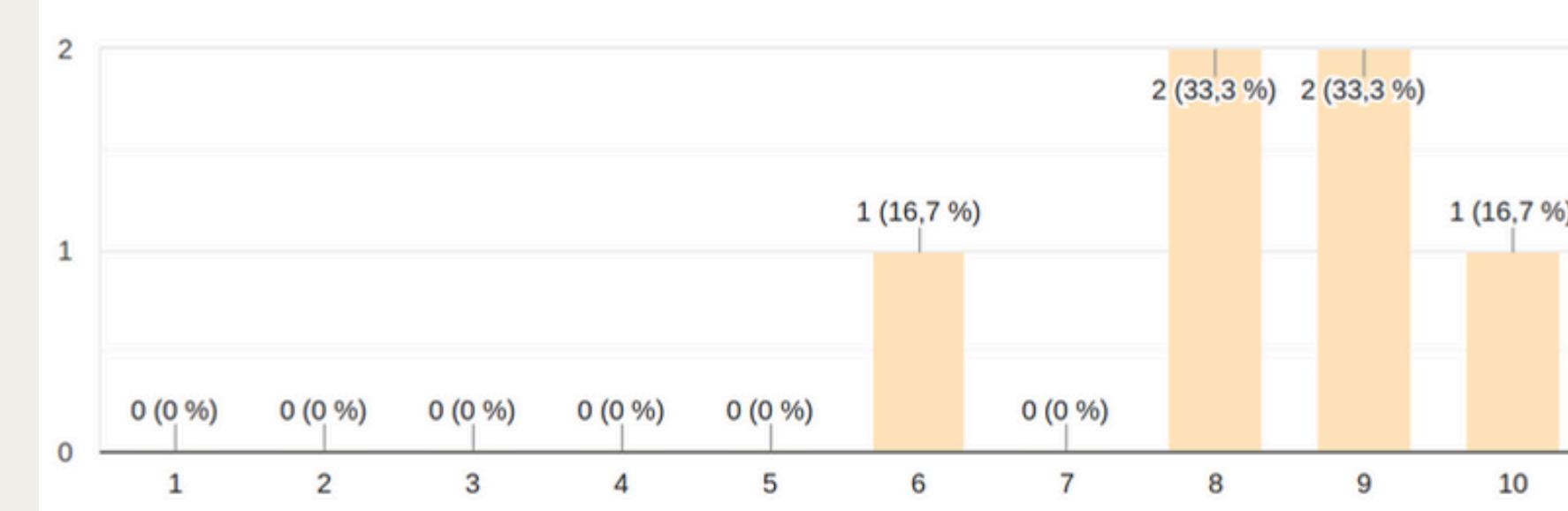
How did the use of the system affect your amount of engagement with the physical world?

- 1: Strongly decreased engagement
10: Strongly increased engagement



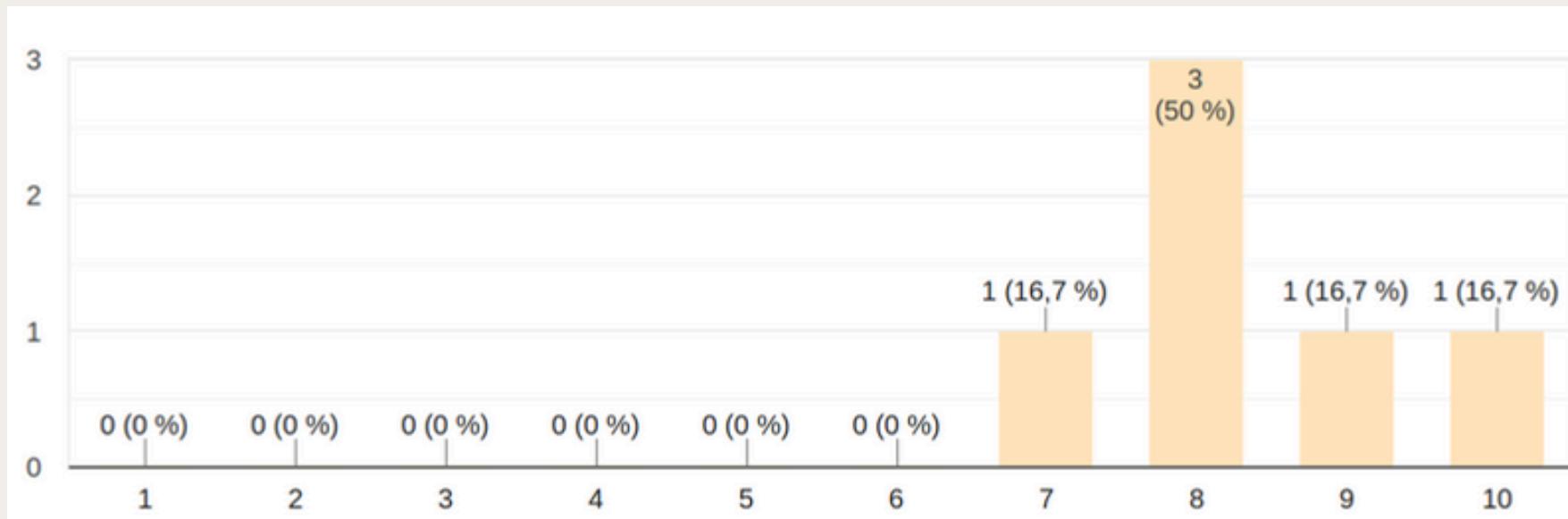
Would you take a detour or a walk to reach an audio note?

- 1: No, Never!
10: As often as possible!



04 Future Use

How likely is it that you would use the app regularly if it were fully developed?
On a scale from 0% to 100%.



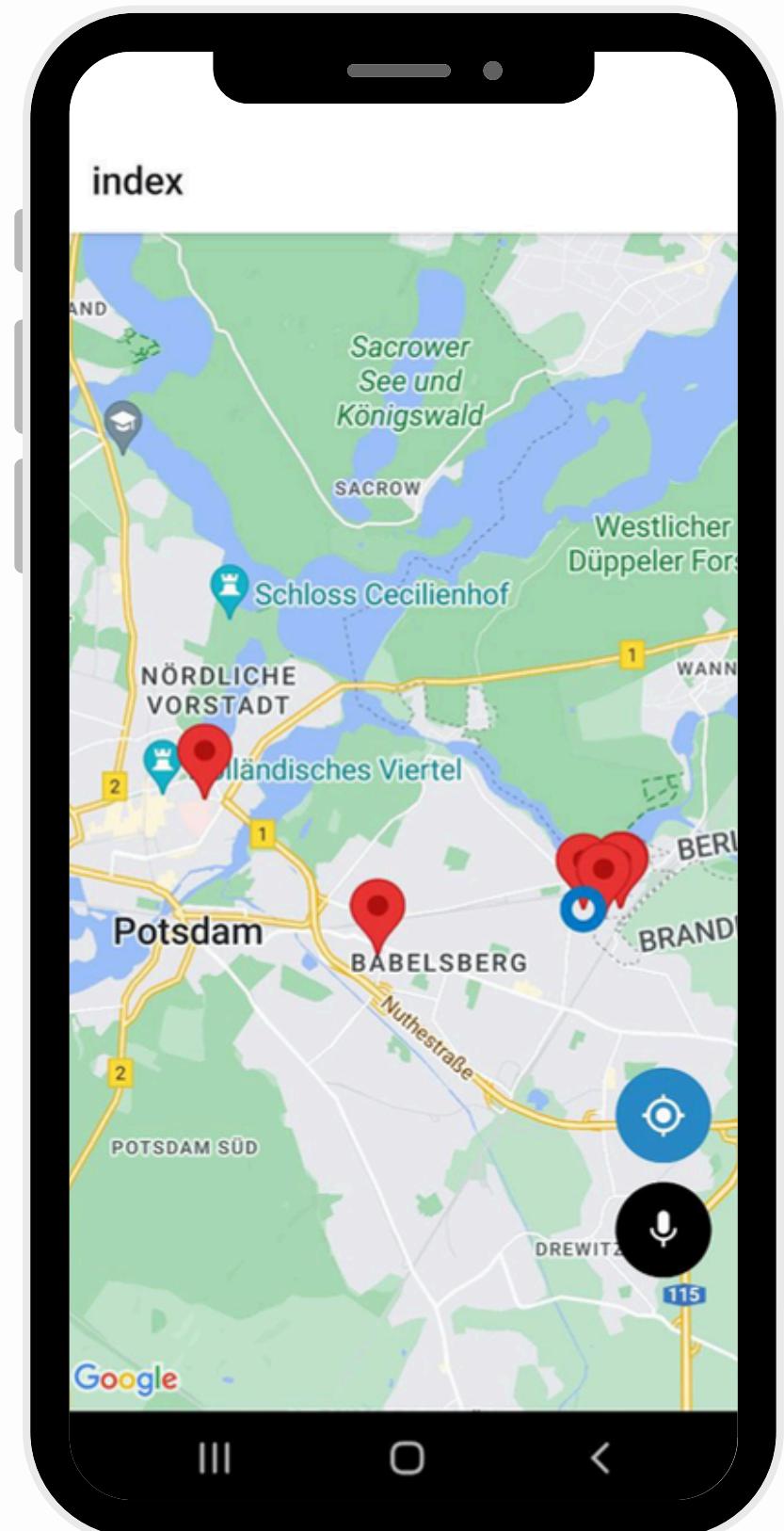
Suggestions for additional features

Allow users to react to messages

Support text-messages and pictures

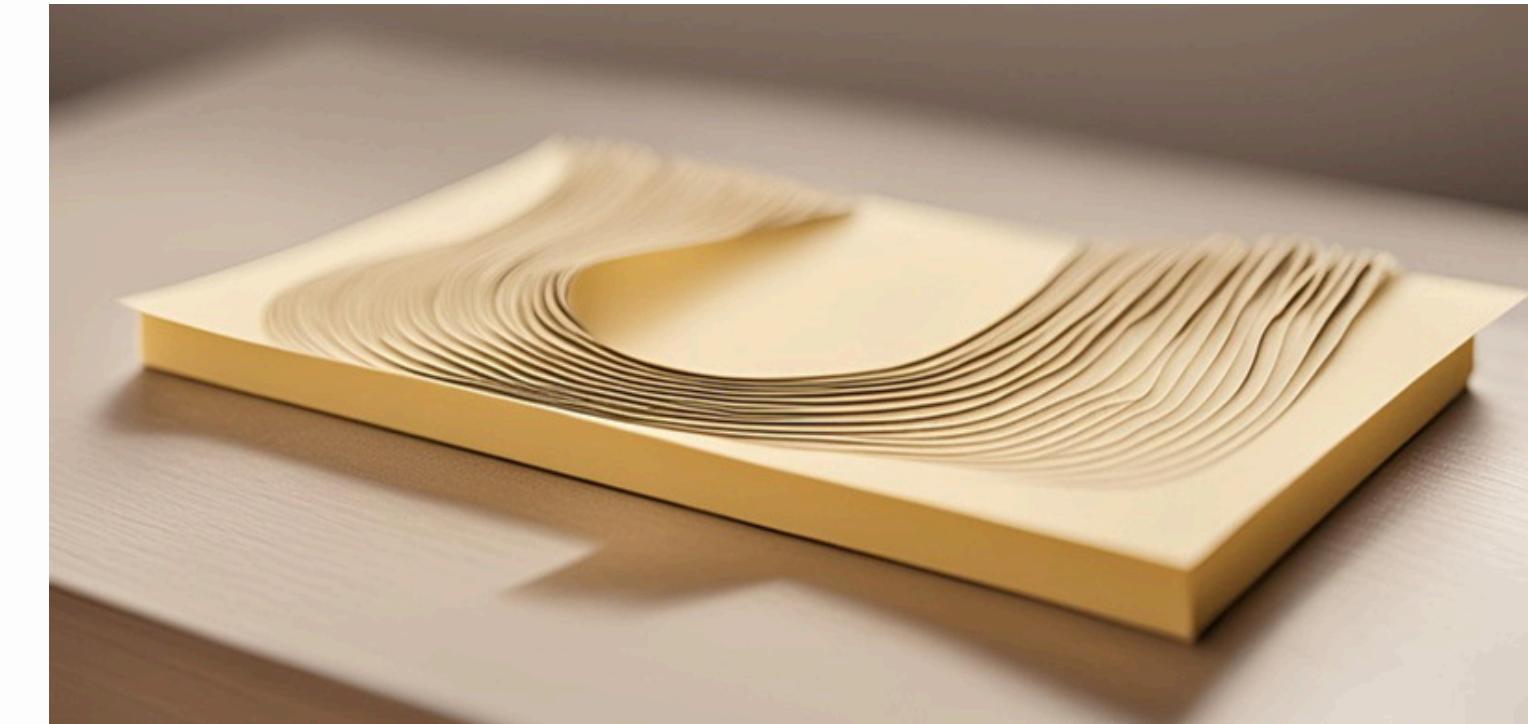
Add voting and report system for public messages

CONCLUSION



This prototype served as a proof of concept, convincing my test group that Echo Marks would be a valuable addition to their daily lives by significantly enhancing their relationships with others and their environment.

ACHIEVEMENTS



1.

Building a prototype that includes all the required features for the MVP

2

Using this prototype to introduce an early test group to the concept of echo marks and evaluate it in relation to the research question

3

Proofing through positive feedback that the conceptual and technical design meets the requirements of the research question

FUTURE WORK

1.

Implement the missing features of the MVP:

- Notify when user is at location of audio file
- Playback only possible when at right location
- Address messages to groups/individuals/public
- Additional configurations (auto play/map visibility)
- Network component

2.

Deploy the product and make it accessible to a large user base

3.

Conduct a large scale User-Study e.g. with the use of questionnaires



4.

Conduct a detailed evaluation of echo marks in relation to the research question

5.

Use the insights gained to adjust Echo Marks and iterate through the feedback loop again

WHAT DID I LEARN

It is very rewarding to work on realizing a vision that one believes in. Even more beautiful is being able to convince other people of this vision and watching it come to life.



REFERENCES

[1] Cheng, Cecilia, and Angel Yee-lam Li. "Internet addiction prevalence and quality of (real) life: A meta-analysis of 31 nations across seven world regions." *Cyberpsychology, behavior, and social networking* 17.12 (2014): 755-760.

[2] Young, Kimberly S., and Robert C. Rogers. "The relationship between depression and Internet addiction." *Cyberpsychology & behavior* 1.1 (1998): 25-28.

