University of Münster

Design Thinking Collaboration to Improve Data Footprint Awareness

International Work Practicum - 2024

Universität Münster

GEORGIA COLLEGE
GEORGIA'S PUBLIC LIBERAL ARTS UNIVERSITY

Smart City Münster

Introduction

The Case

“How might we make people and organizations aware that their day-to-day data creation greatly adds to the CO2 emission, and achieve a change in their behavior?”

Design Thinking Process

Empathize

1. PHASE

Empathize

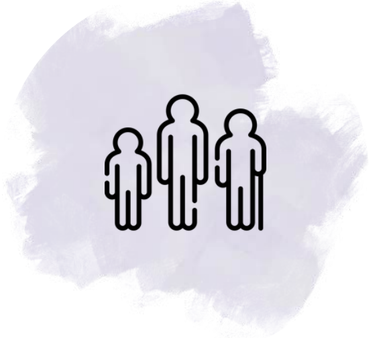
To further understand the problem, we split into three teams:

Research

Survey

Representatives

Survey



Demographic

Age

Environmental awareness

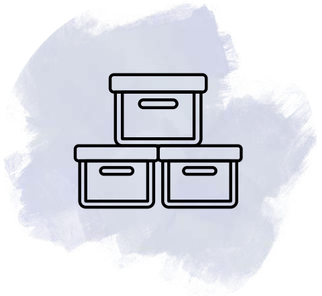
How environmentally aware are you?

Messages

How are messages sent?

Data waste

Awareness about data waste
% of unnecessary data



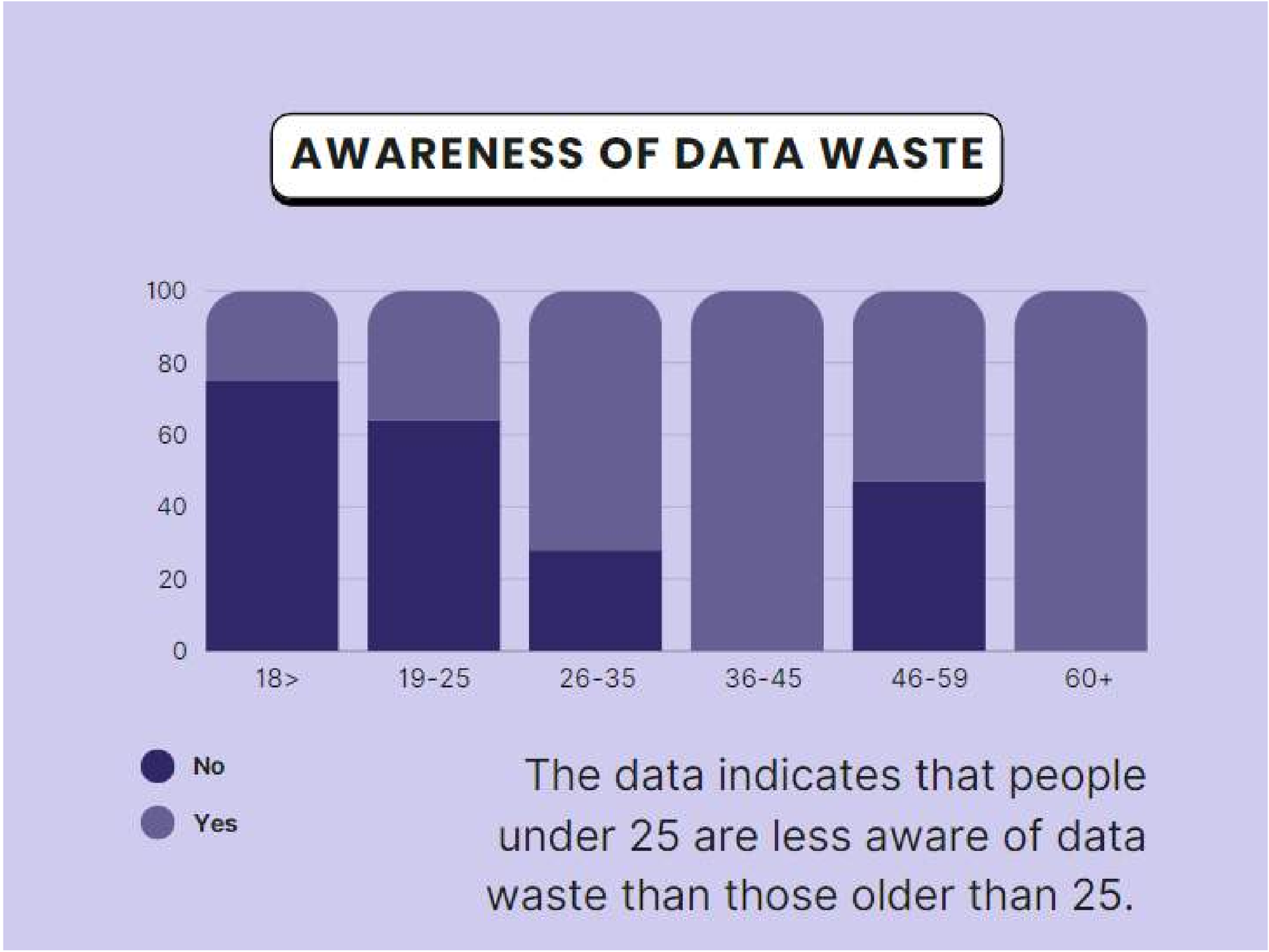
Data storage

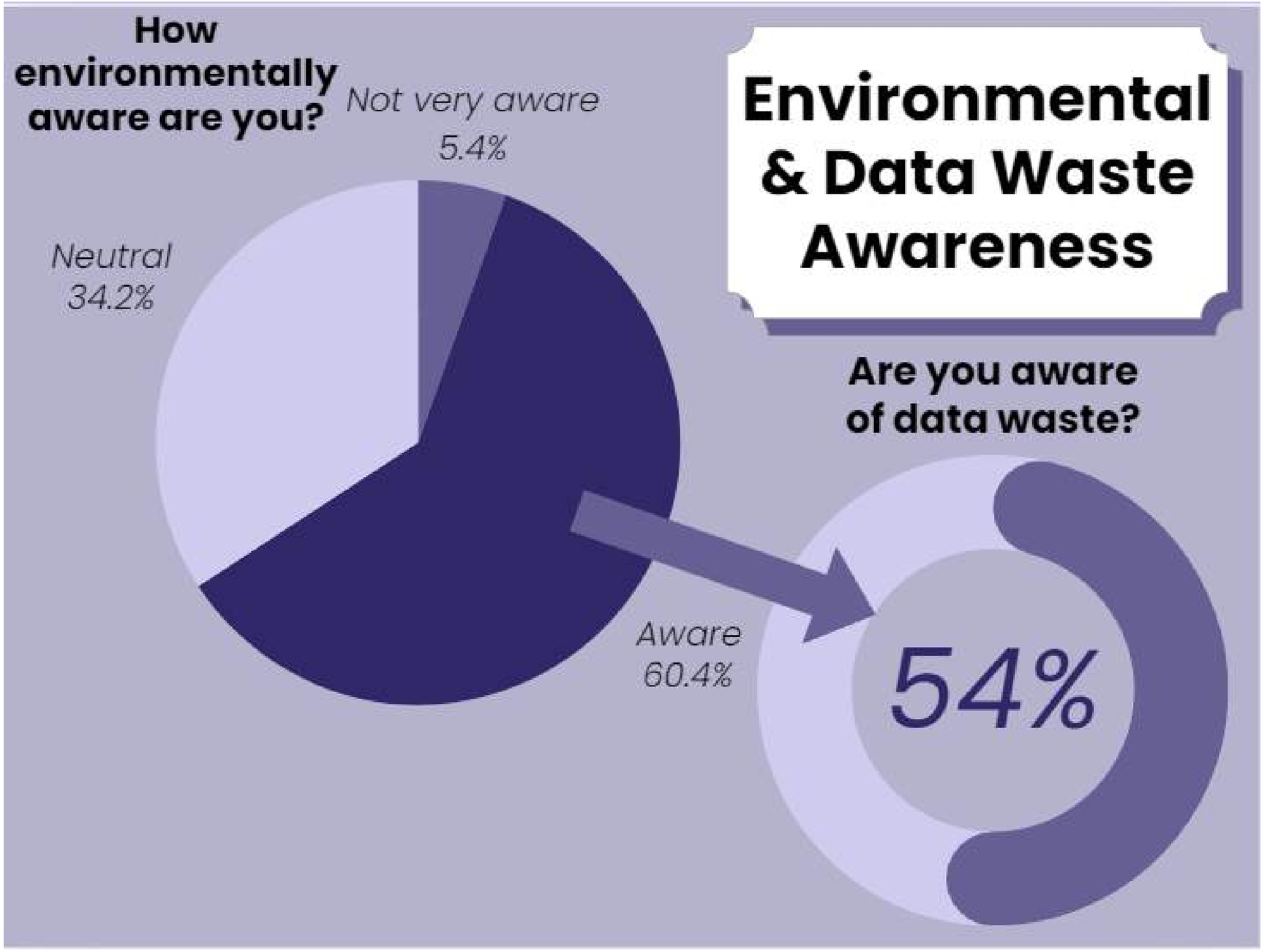
How often do you delete data and why?

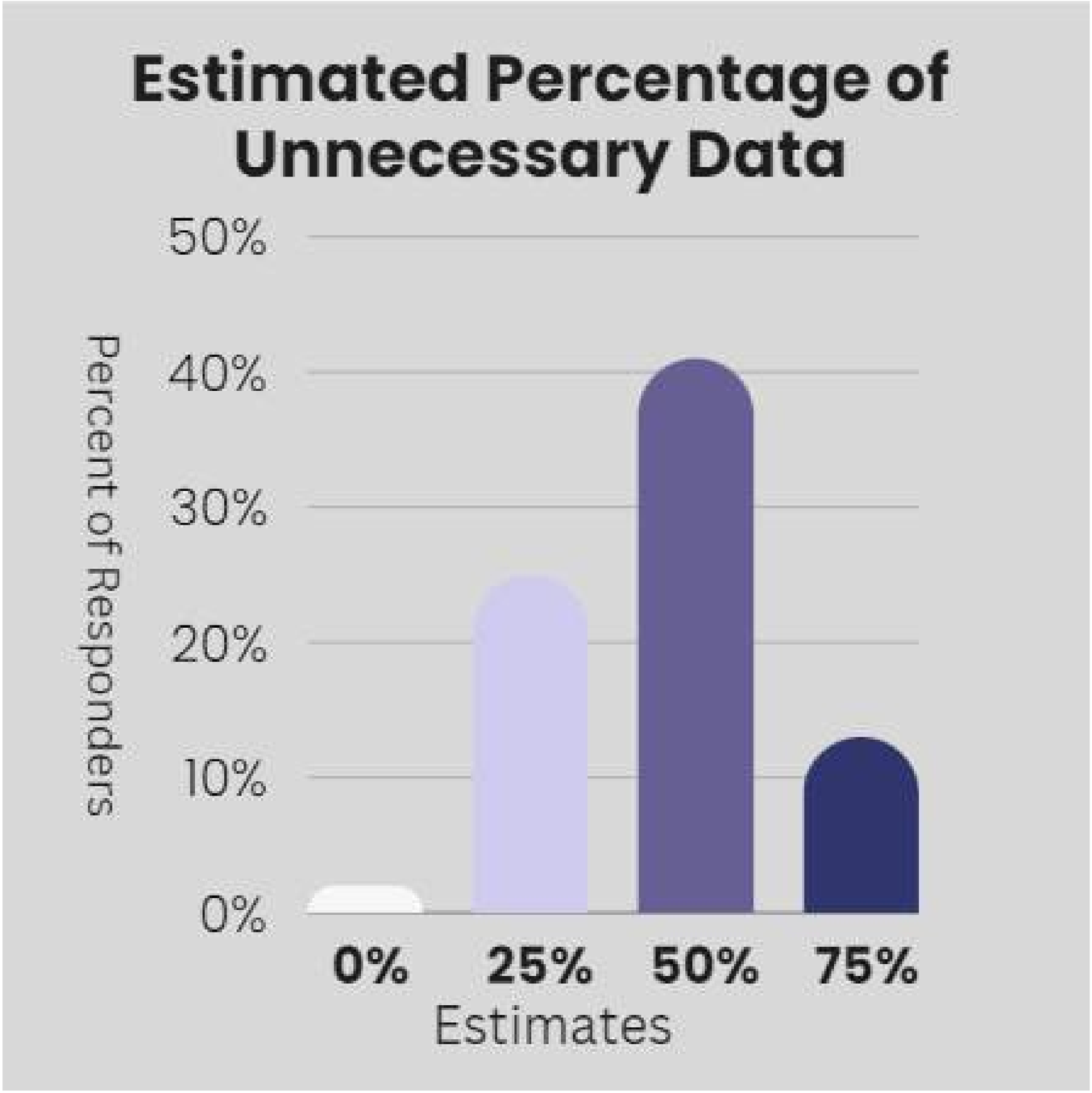
Empathize

1. PHASE

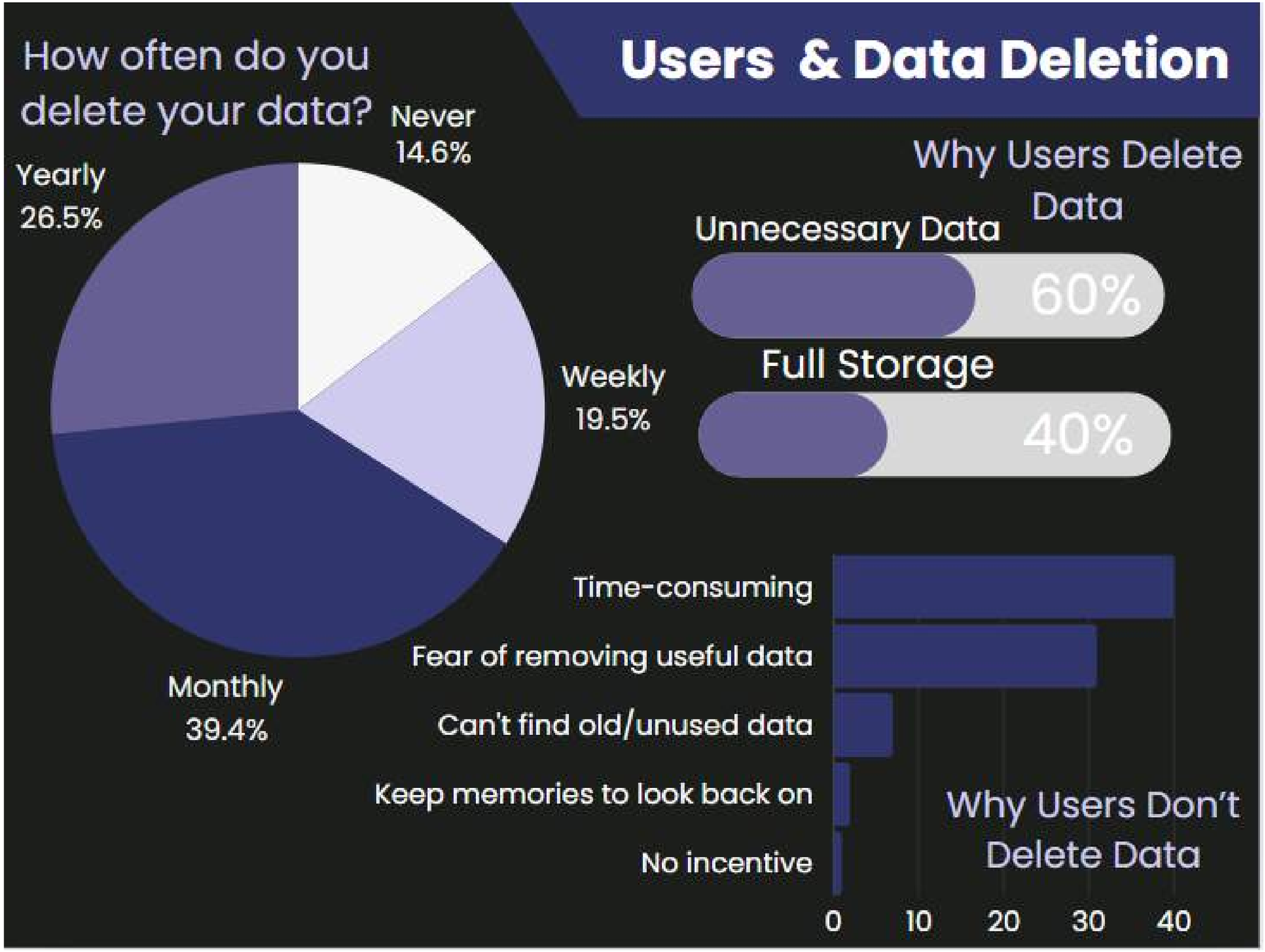
Results


AWARENESS OF DATA WASTE
100
80
60
40
20
0
18>
19-25
26-35
36-45
46-59
60+
No
Yes
The data indicates that people under 25 are less aware of data waste than those older than 25.


How environmentally aware are you?
Not very aware 5.4%
Neutral 34.2%
Aware 60.4%
Environmental & Data Waste Awareness
Are you aware of data waste?
54%

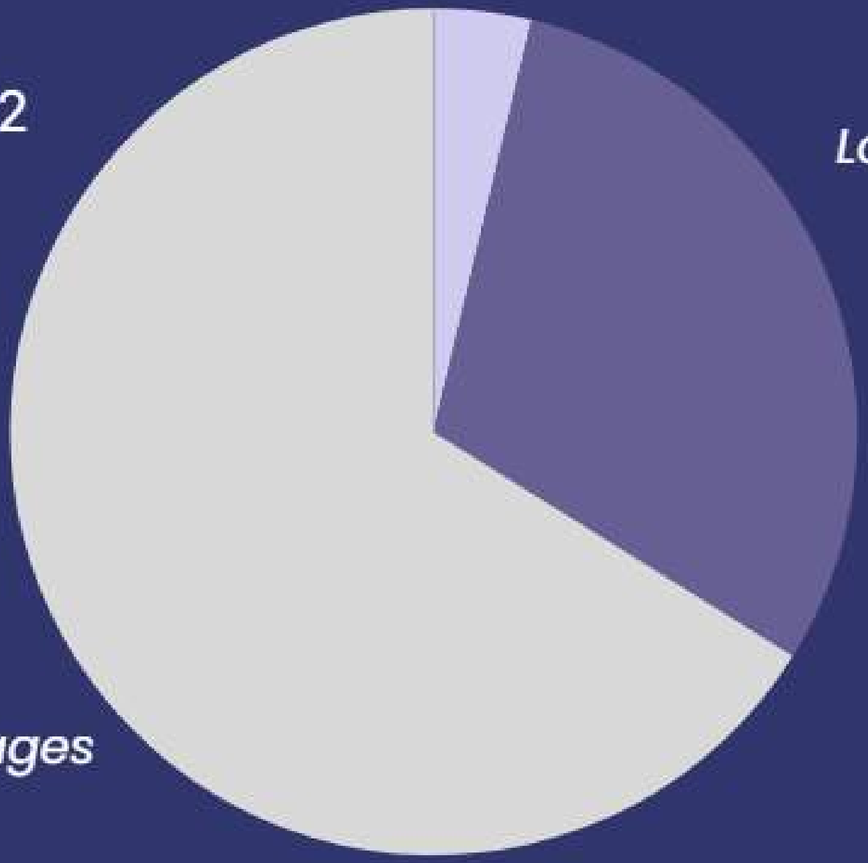

Estimated Percentage of Unnecessary Data
50%
40%
30%
20%
10%
0%
Percent of Responders
0%
25%
50%
75%
Estimates

Users & Data Deletion



HOW ARE MESSAGES SENT?

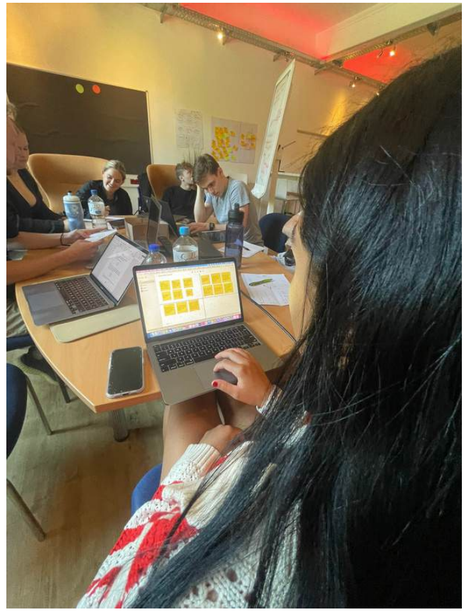
Texting with multiple short messages and voice messages produce more CO2 than longer paragraphs.

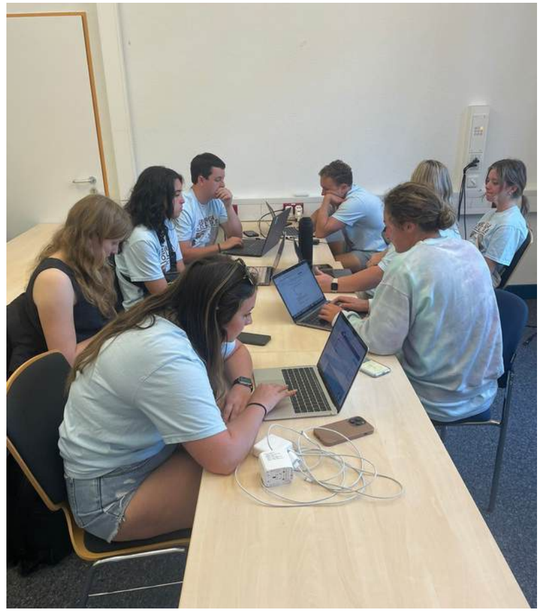


What do you think could reduce data waste?

Empathize

1. PHASE





Sara

32 years old

houswife, mother of two kids, married & influencer

acts

Sending pics of her kids in the family group via **whatsapp**

loves holding **memories forever**

values

Online popularity

Recognition

personality

Cares too much about **online presence** & what **other people** think

bad mood offline, good mood online

arrogant

> **“As I am very busy, I need an easy way to manage my data”**

Empathize
1. PHASE

Persona

Clara

20 years old

Student: Marketing Major and IS Minor

acts

meeting friends

She likes **photography**, does it professionally at weddings

values

friends and **family**

success & the **environment**

personality

bit **shy** and **not very outgoing**

online shopping addicted

subscribes to shopping websites

always **stressed** about the **environment** and **uni**

> **I need to be more aware of data waste as an environmentally conscious person.**

Empathize

1. PHASE

Persona

Michael

48 years old

electrician, married, two kids, lives a modest life

acts

works long hours

lot of work **documents**

Only **deletes** data on his old phone when the **storage is full**

can't afford to change his lifestyle to benefit the environment.

values

loves his **family** and **friends**

introvert but confident and **polite**

pessimistic (life sucks)

needs

struggles to provide for his family

not good at communicating

“ I don't care much about the environment, so I don't want any extra tasks. I would need a really easy solution to do something ”

Empathize

1. PHASE

Persona

John

55 years old

CEO of 5k employee mid-sized company (Meal-Kit delivery), PHD in Economics

acts

Single with no interest in long-term

values

parental pressure

judging unsuccessful people

narcissistic

unaware of data waste

needs

addicted to **instant gratification** and **success/results**

driving for the **biggest challenge possible**

> **“As a CEO I have the opportunity to influence a lot of people”**

Empathize

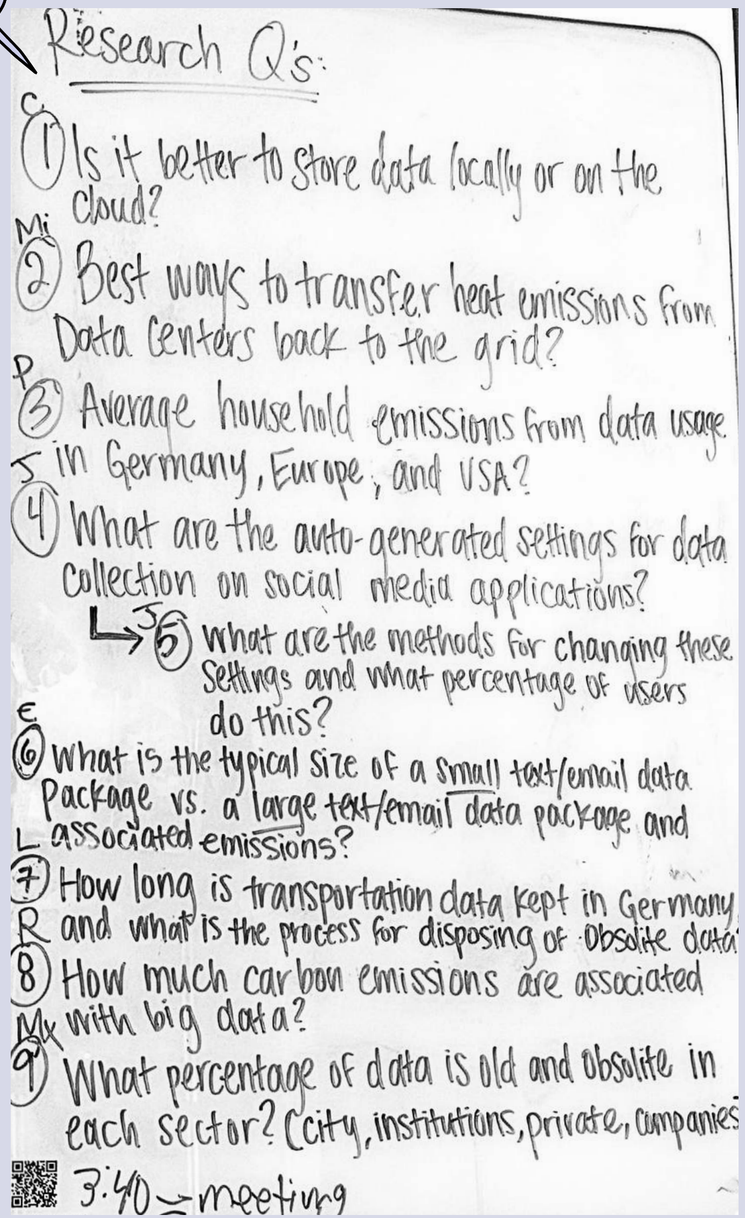
1. PHASE

Persona

Define

2. PHASE

Research



Research Q's:

C
(1) Is it better to store data locally or on the cloud?

Mi
(2) Best ways to transfer heat emissions from Data centers back to the grid?

P
(3) Average household emissions from data usage in Germany, Europe, and USA?

J
(4) What are the auto-generated settings for data collection on social media applications?

J
(5) What are the methods for changing these settings and what percentage of users do this?

E
(6) What is the typical size of a small text/email data package vs. a large text/email data package and associated emissions?

L
(7) How long is transportation data kept in Germany and what is the process for disposing of obsolite data?

R
(8) How much carbon emissions are associated with big data?

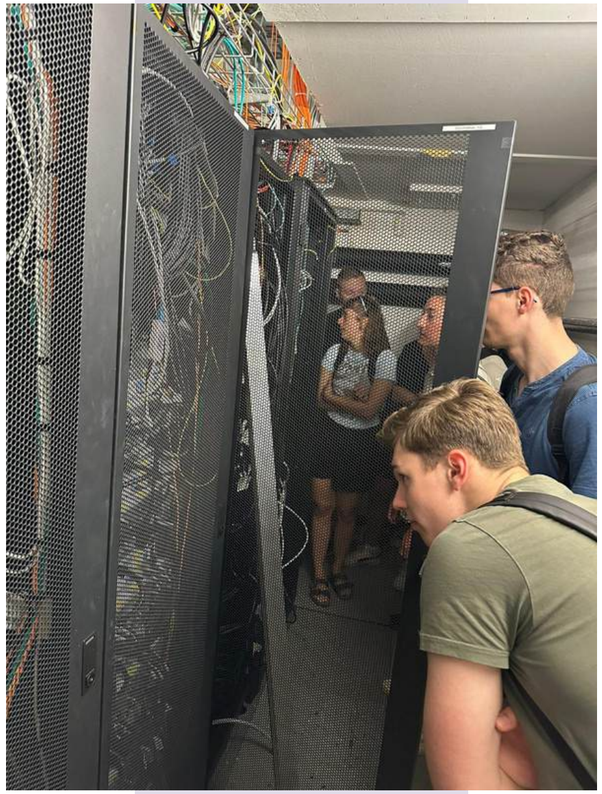
My
(9) What percentage of data is old and obsolite in each sector? (city, institutions, private, companies)

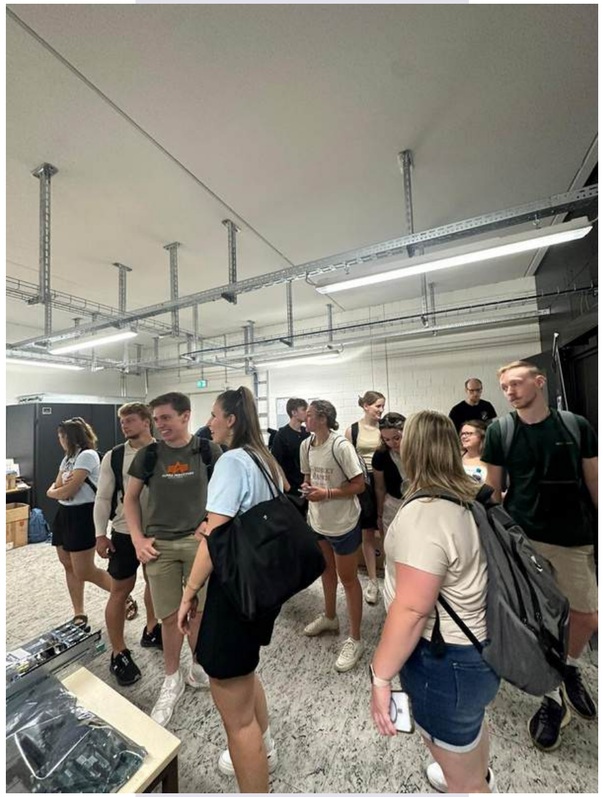
3:40 ~ meeting

- Research most common issues
- Develop themes & create questions
- Answer questions
- Analysis of answer
- List common problems and vote

Define
2. PHASE

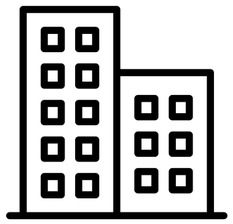
Data Center Visit



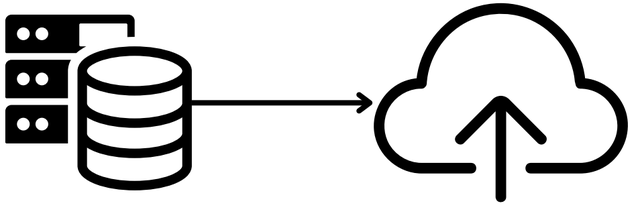


Define
2. PHASE

Research - Fun Facts



vs



10%

10.000 apartments

1TB causing 200kg/year

4g of CO2

0.014g of CO2

49%

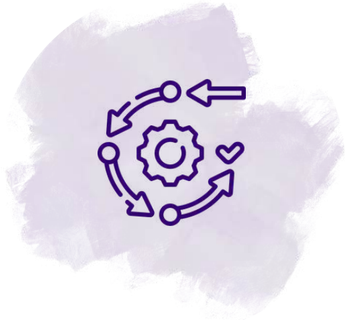
up to 40% efficiency increase

Ideate

3. PHASE

Problem Statement

People and companies lack awareness of data consumption and how their data is stored in data centers which creates a negative environmental impact.



How Might We...

Increase people's awareness of CO2 emissions from data waste?

Increase companies' awareness of CO2 emissions from data waste?

Seamlessly integrate data awareness into daily life?

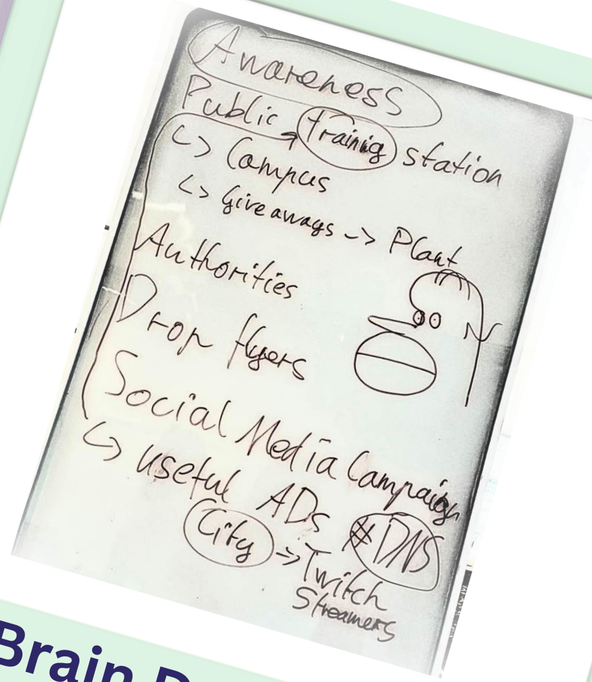
Streamline data deletion processes?

Reduce fear associated with deleting unnecessary data?

Ideate

3. PHASE

Crazy 4's



Brain Dump/Draw It Out

To ideate, we:

1. Split into our persona group
2. Determined a methodology
3. Compiled all ideas into a master list

How might we increase people’s awareness of CO2 emissions from data waste?

Ideate

3. PHASE

How might we increase people’s awareness of CO2 emissions from data waste?

Digital pet

Energy consumption arcade

Interactive e-waste sculptures

Human Awareness Infographic

How might we increase companies’ awareness of CO2 emissions from data waste?

Ideate

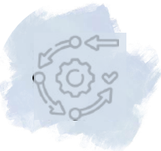
3. PHASE

How might we Increase companies’ awareness of CO2 emissions from data waste?

Annual employee training

Workshops on alternative solutions for data deletion

Cooperate with local schools



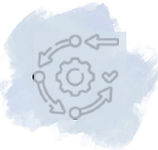
How might we seamlessly integrate data awareness into daily life?

Ideate

3. PHASE

How might we seamlessly integrate data awareness into daily life?

- Mobile wallet data storage
- Power bank data storage
- Cooperate with influencers/sports team/local suppliers (company)
- App



How might we streamline data deletion processes?

Ideate

3. PHASE

How might we streamline the data deletion processes?

Manage email accounts

“Data Management” branch

Company-wide data deletion reminders

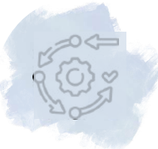
How might we reduce fear associated with deleting unnecessary data?

Ideate

3. PHASE

How might we reduce fear associated with deleting unnecessary data?

“Lite” versions of Apps



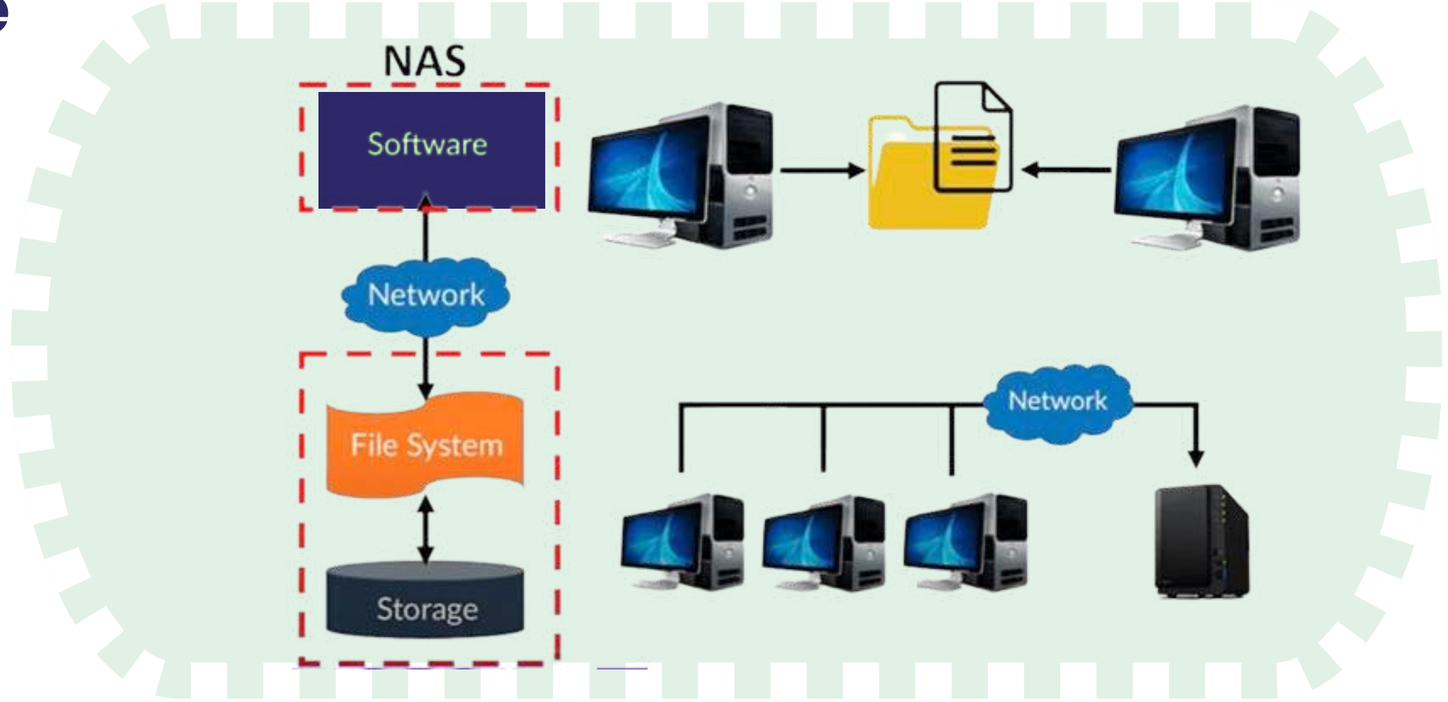
Prototype

4. PHASE

“Lite” Version Apps

Prototype
4. PHASE

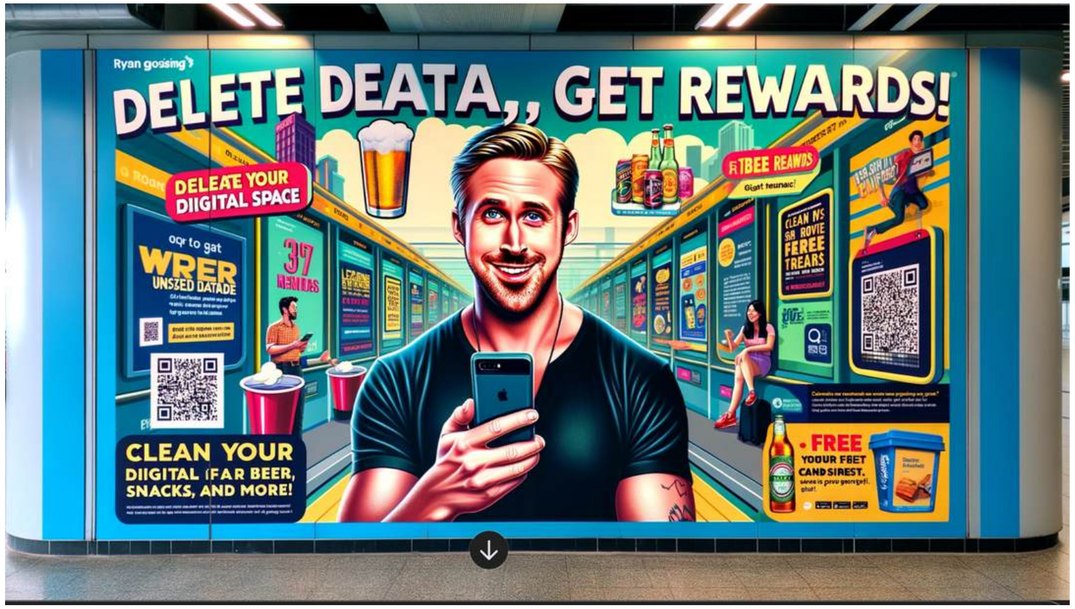
Private Storage



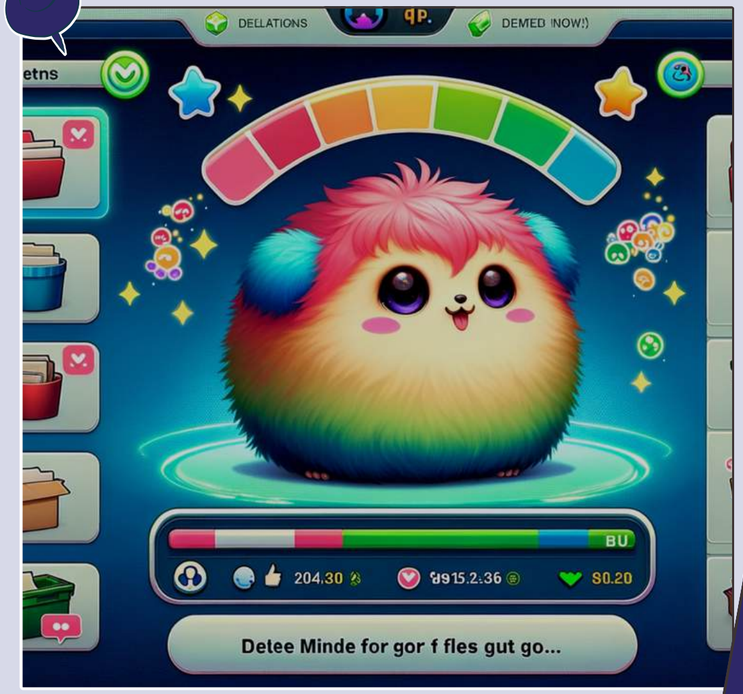
Digital Wallet Data Storage Short-Term

Power Bank Data Storage Long-Term

Cooperate with Influencers, Sports Teams, & Local Businesses



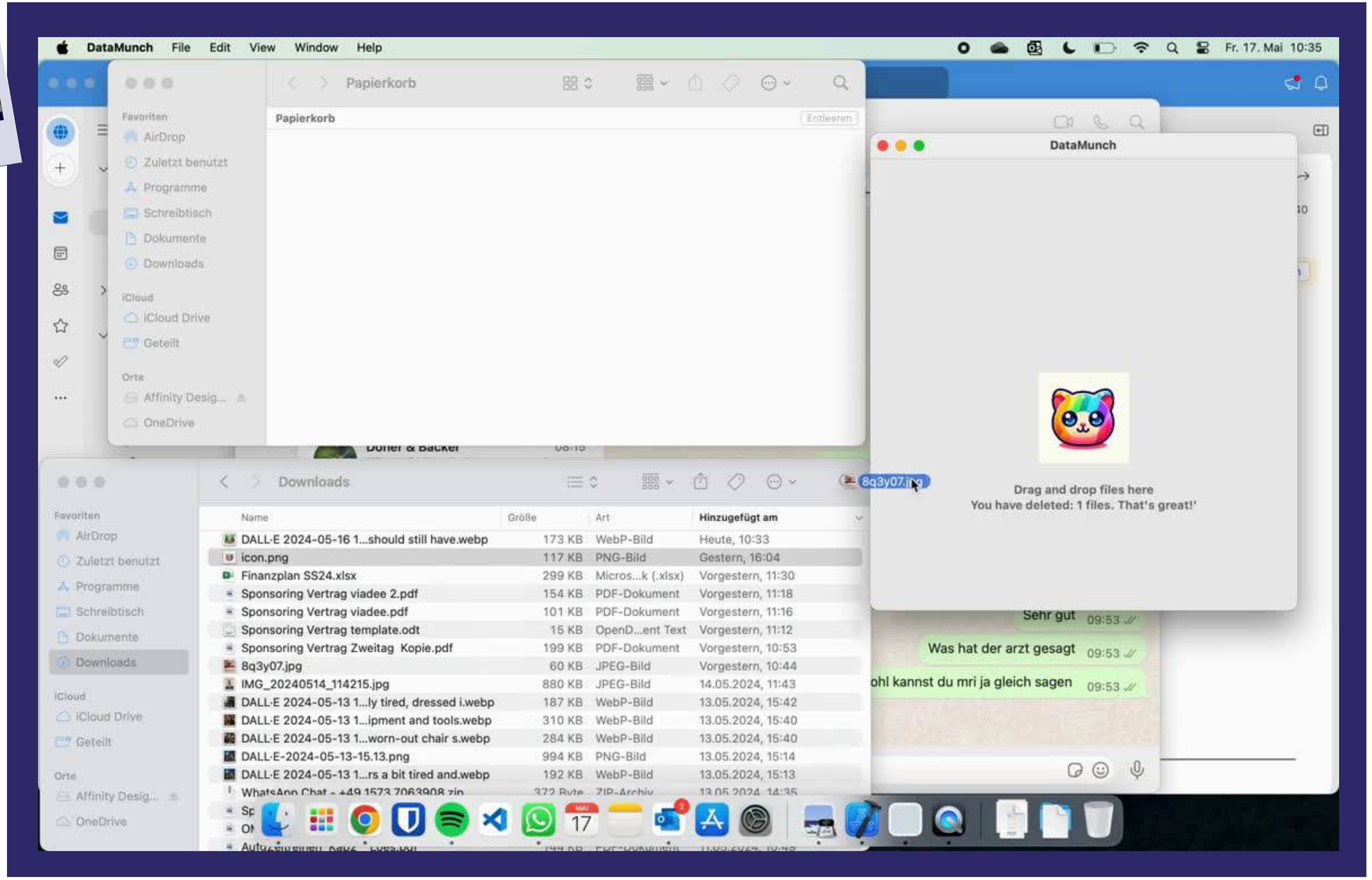
Arcade



Interactive Pet

E-Mail Mgmt. Software

Interactive Pet


DataMunch File Edit View Window Help
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Papierkorb
Favoriten
AirDrop
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Geteilt
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DataMunch
Drag and drop files here
You have deleted: 1 files. That's great!'
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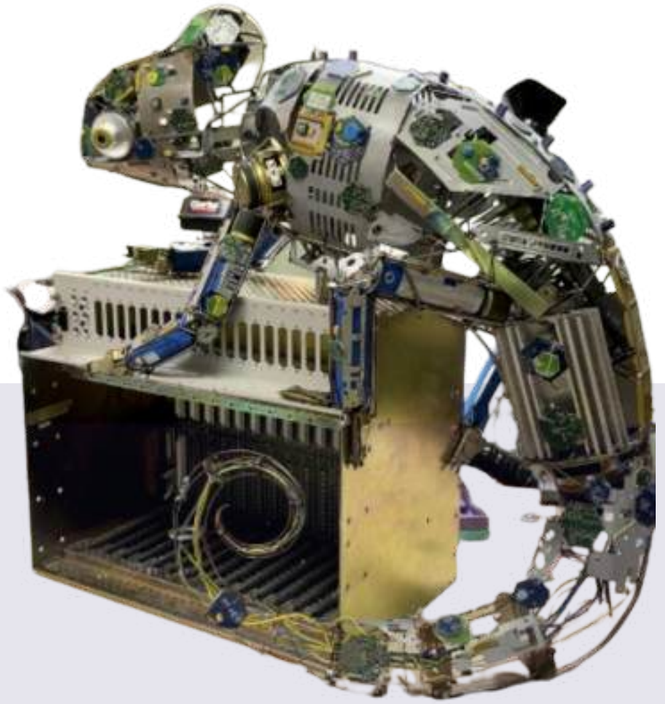
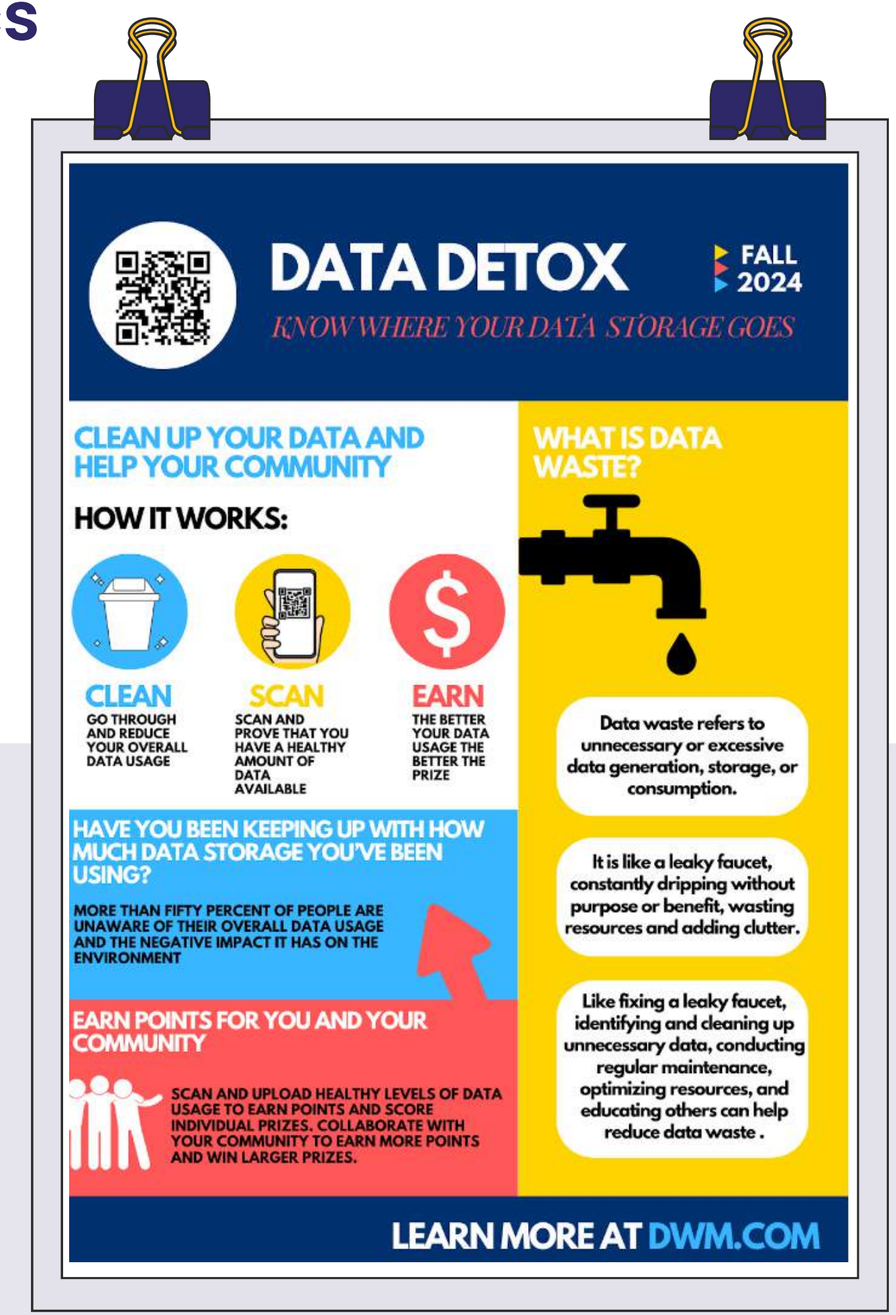
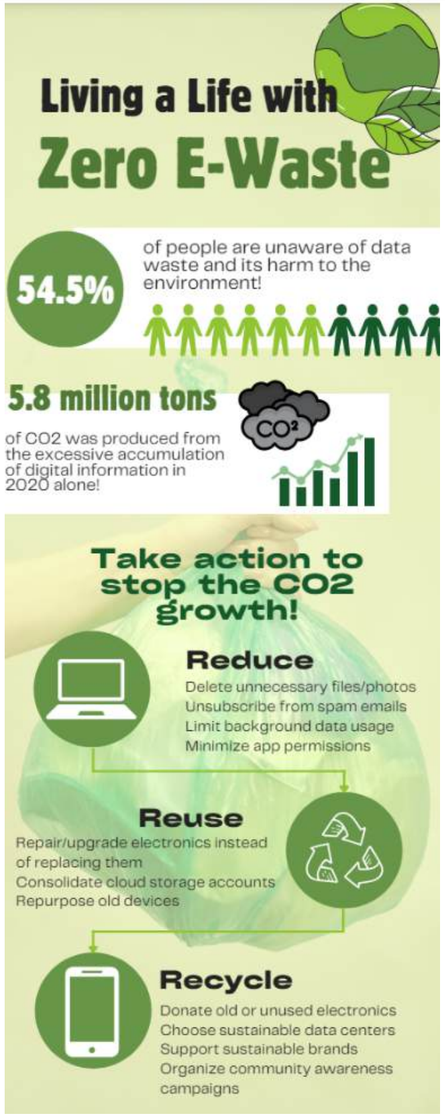
DALL·E-2024-05-13-15.13.png 994 KB PNG-Bild 13.05.2024, 15:14
DALL·E 2024-05-13 1...rs a bit tired and.webp 192 KB WebP-Bild 13.05.2024, 15:13
Sehr gut 09:53
Was hat der arzt gesagt 09:53
ohl kannst du mri ja gleich sagen 09:53

Data Waste Interactive Sculptures

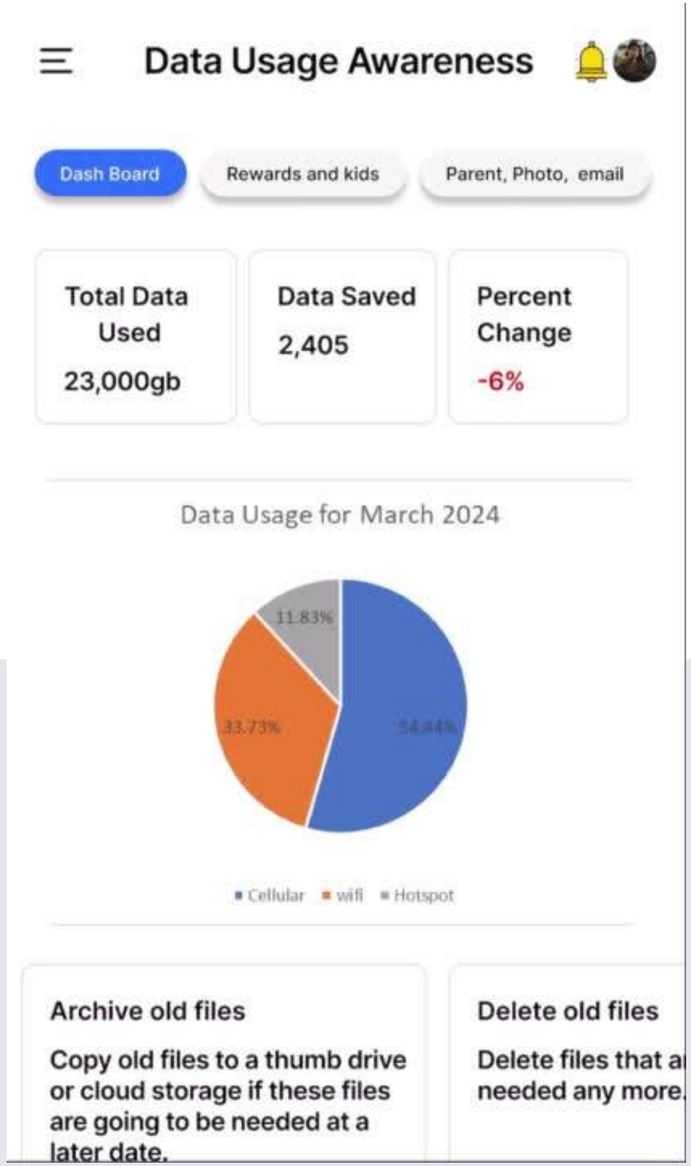


Infographics





Data Usage Awareness App



Test

5. PHASE

725 651
Salary
230 256
=10583.36
10
MONTH
11
MONTH
852 258
425 025

App

WHAT

- User Friendliness
- Practicality
- Reliability
- Appeal
- Effectiveness

HOW

- Star rating
- Survey
- tracking hours of use
- Longevity
- Test accuracy of the trackers
- bring in people to test app

WHY

- have an effective, usable, and reliable app for users to use on an everyday basis
- clear their unneeded data in order to decrease data waste

Energy Consumption Arcade

WHAT

- the effectiveness of generating awareness to companies and individuals with the different games and simulations

HOW

- have a sample group of people take a survey prior to playing in the arcade
- allow playing time for about an hour
- afterward create a post survey to see how much more aware they are
- rate their experience

WHY

- allows companies and individuals to see the effectiveness of the arcade
- responses from other users when deciding to partake in a workshop
- for annual company training or individual workshop about sustainability practices.

Interactive pet – DataMunch

WHAT

- **DataMunch** is an interactive digital pet that lives on your computer and thrives on a diet of old files and unused data.
- This virtual companion helps you to maintain a clean and efficient digital workspace

HOW

- You choose a virtual pet to adopt that you can then find on your desktop
- It grows by consuming your old files and data.
- Just drag and drop the files that you no longer need onto it, and then you will receive instant positive feedback
- It has interactive features to make the process more enjoyable and rewarding.

WHY

- Data waste is a growing concern. Unused files, outdated documents can clog up your computer and omit mass amounts of co2
- DataMunch provides a solution by turning the annoying, tedious chore of deleting files into a fun and interactive experience.

Company-wide Data Deletion Reminders

WHAT

- an automated data deletion reminder

HOW

- sent to every device on company wi-fi on the first Wednesday of every other month

WHY

- allows employees to take the same time to sort, organize, and maximize their data storage
- helps decrease data redundancy and eliminate unnecessary data
- frees up storage for essential files; overall reduces CO2 emission

Managing Email

WHAT

- **CleanSweep** is a powerful browser extension designed to help you maintain a clutter-free email inbox and file system.
- By automating the deletion of old files and emails, CleanSweep ensures your digital workspace remains efficient and organized.

HOW

- Every 30 days, CleanSweep automatically deletes 10 of your oldest files or emails unless you choose to star them
- Additionally, it brings up each file or email for review, allowing you to keep only what's necessary.

WHY

- Through research and surveys we have found that one of the main reasons people do not delete files is because it is too time consuming.
- CleanSweep should help to cut time in data deletion, reducing overall data waste and negative environmental impacts

Private Storage

WHAT

- A remotely accessible storage to store your data and make it available anywhere!

HOW

- Systems for NAS Storage already exist in a wide variety.
- Adding a NAS Storage System to your local network makes it accessible in your own network.
- This can be extended by using a VPN Service to make it securely available remotely

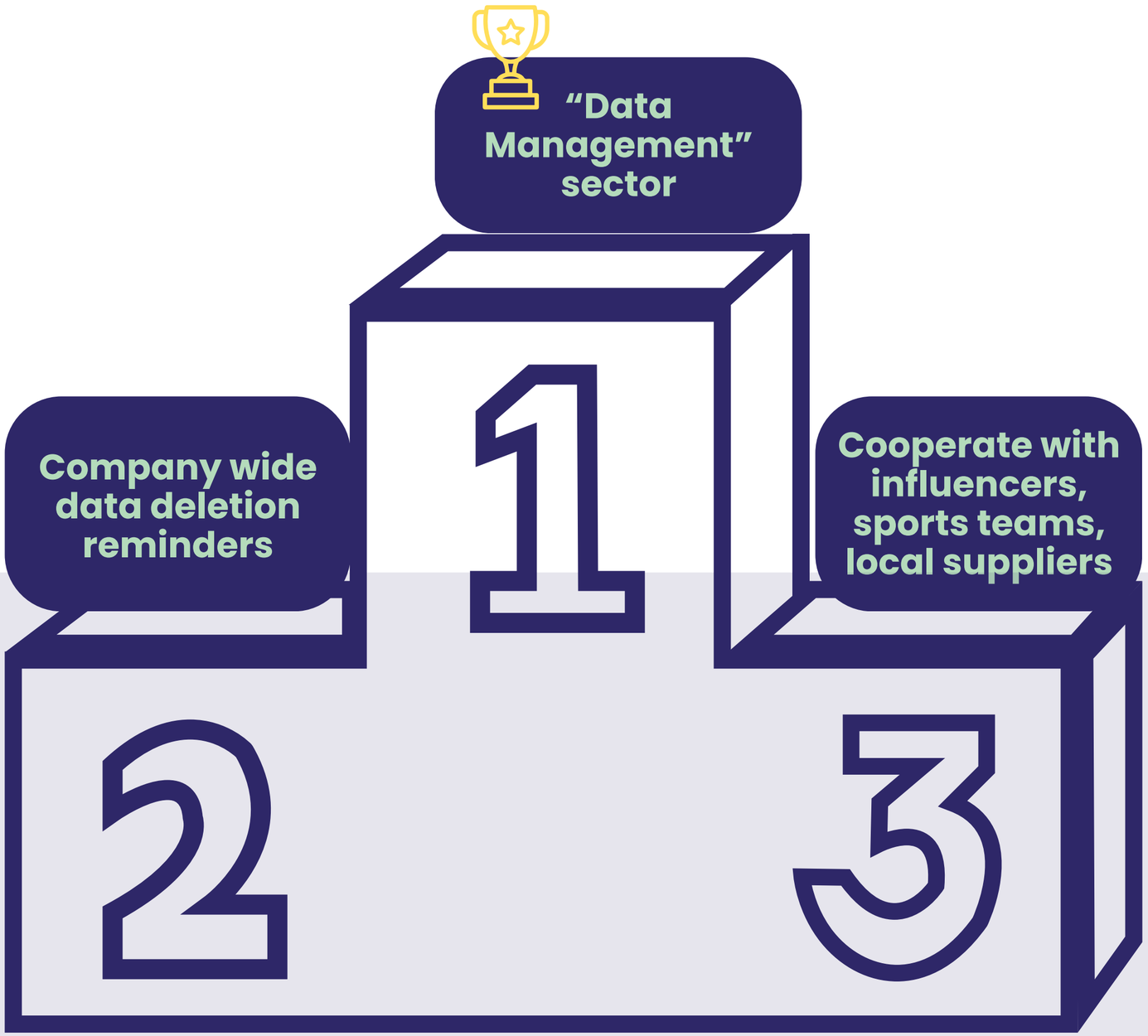
WHY

- A private NAS Storage allows people to store data and make it accessible remotly via VPN.
- By using this form of storage people gain independence from cloud providers – making storing of data possible without unnessecary redundancies and security concerns.

Individuals

Recommendations
TOP 3

Companies



Recommendations

TOP 3

Presented by
Chloe, Cole, Ellie, Grace,
Madison, Margeaux, Robin

Thank you very much!

Project 2024

Works Cited

https://stanfordmag.org/contents/carbon-and-the-cloud#:~:text=Compared%20with%20your%20personal%20hard,the%20usual%20U.S.%20electric%20mix.

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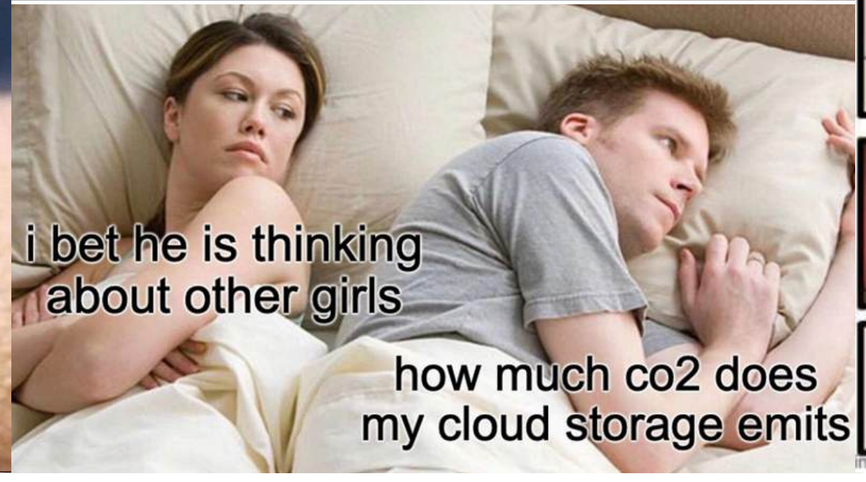
I REGULARLY
DELETE MY FILES

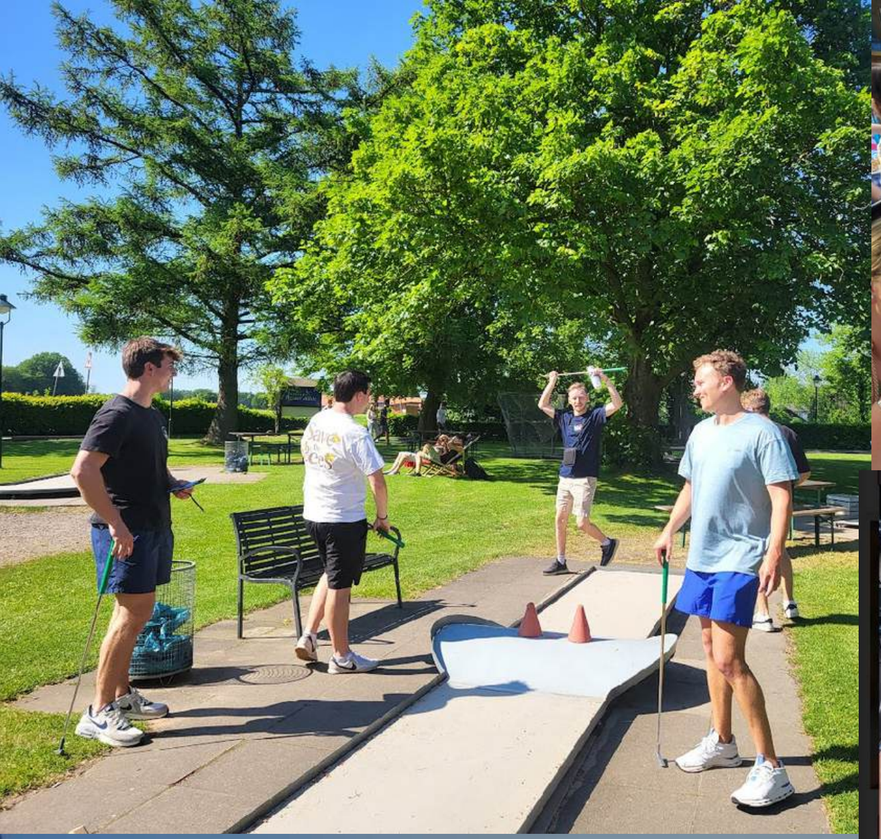
"AND THEN I LIT MY
CIGARETTE IN THE DATA CENTER"


i bet he is thinking
about other girls
how much co2 does
my cloud storage emits

how can we reduce data waste?

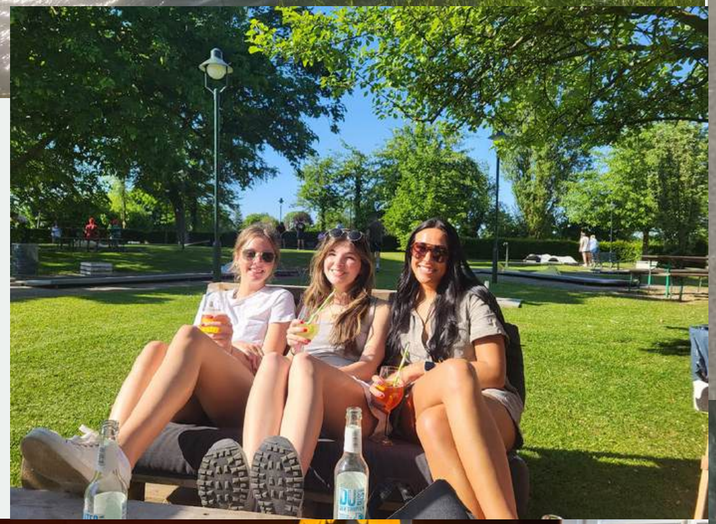
buy more
cloud storage
save files on a
harddrive
just remove
some photos

imgflip.com



Krummer Timpen

GEORGIA
COLLEGE



SPATZL

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