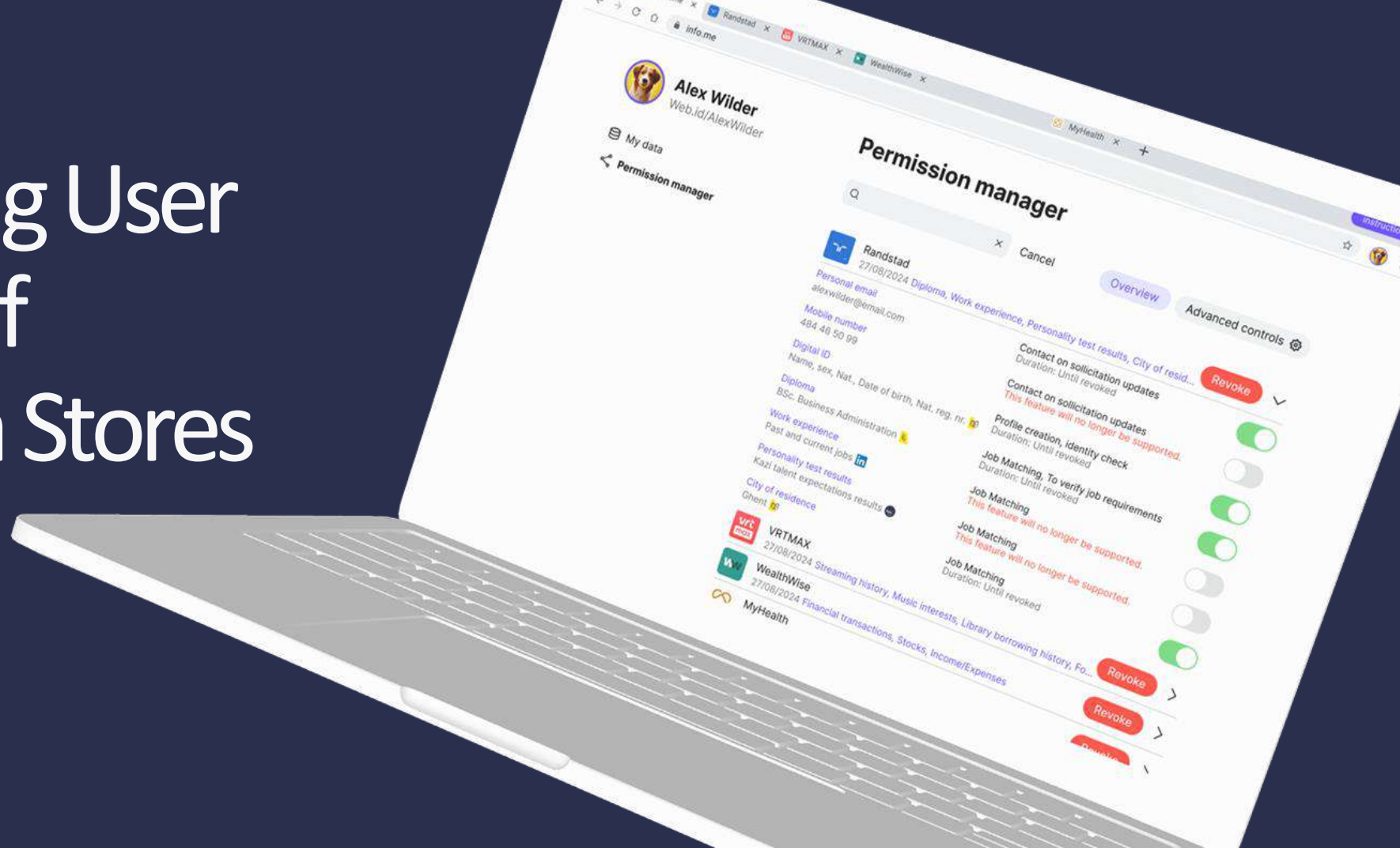


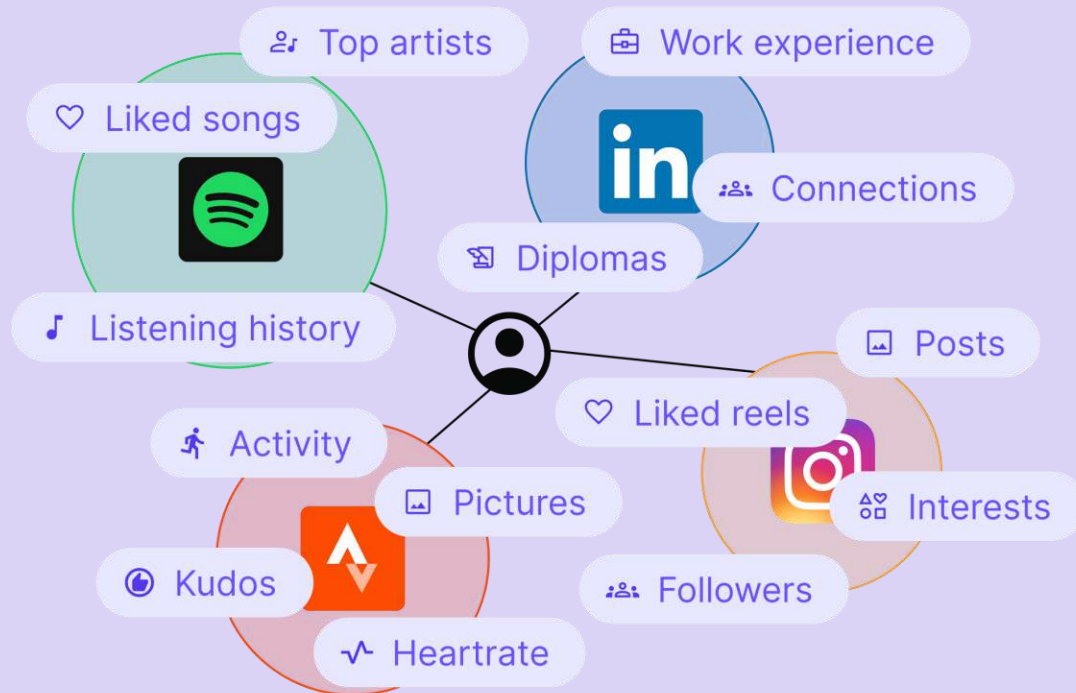
Understanding User Perceptions of Personal Data Stores

Tim Theys
Imec-Mict-Ugent

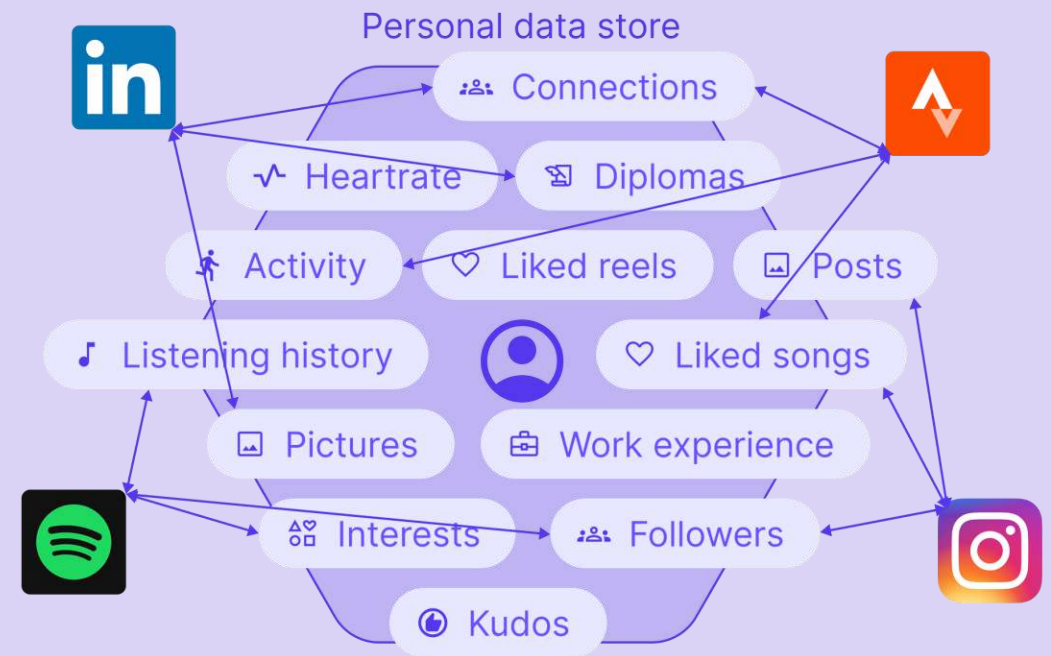


A Personal Data Store (PDS) is

a technology that enables individuals to **collect, store, update, correct, analyse, and share** their **personal data**. A key feature of a PDS is its **granular consent** management, allowing users to grant or revoke third-party access at any time



Data stored by service providers



Data stored in a Personal Data Store (PDS)

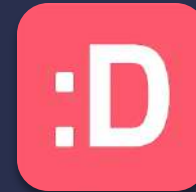


CitizenMe
100K+



Digi.me
100K+

MyData
Certified PDS
2023
Number of
Google Play Store
Downloads



My:D
100K+



Ockto
100K+



Yivi
50K+



BitsAboutMe
10K+



DID Wallet
5K+



iGrant.io
1K+



PolyPod
1K+



Esatus
1K+



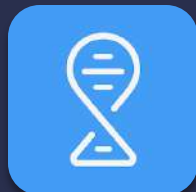
Cozy Cloud
500+



MyFairData
100+



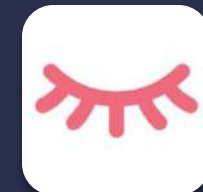
Financieel Paspoort
100+



Geens
100+



Meeco Wallet
100+



Schluss
100+



CitizenMe
100K+ - 0



Digi.me
100K+ - 0

MyData
Certified PDS
2023 - 2025
Number of
Google Play Store
Downloads



My:D
100K+ - 100K+



Ockto
100K+ - 100K+



Yivi
50K+ - 100K+



BitsAboutMe
10K+ - 0



DID Wallet
5K+ - 5K+



iGrant.io
1K+ - 1K+



PolyPod
1K+ - 0



Esatus
1K+ - 1K+



Cozy Cloud
500+ - 5K+



MyFairData
100+ - 0



Financieel Paspoort
100+ - 500+



Geens
100+ - 100+



Meeco Wallet
100+ - 0



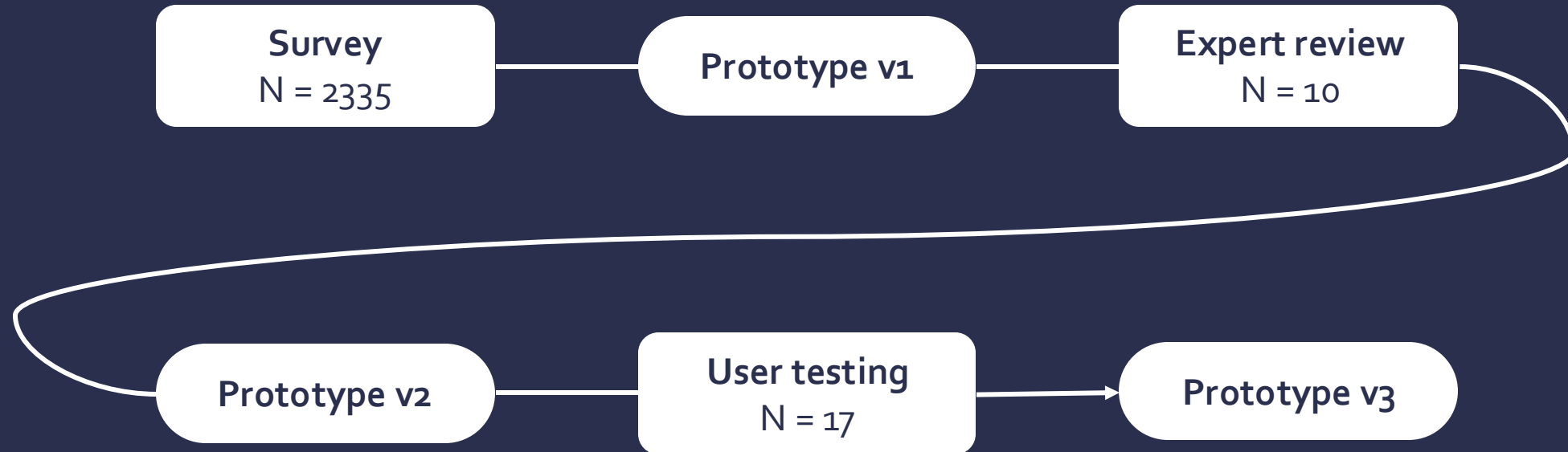
Schluss
100+ - 0

Hurdles to PDS adoption

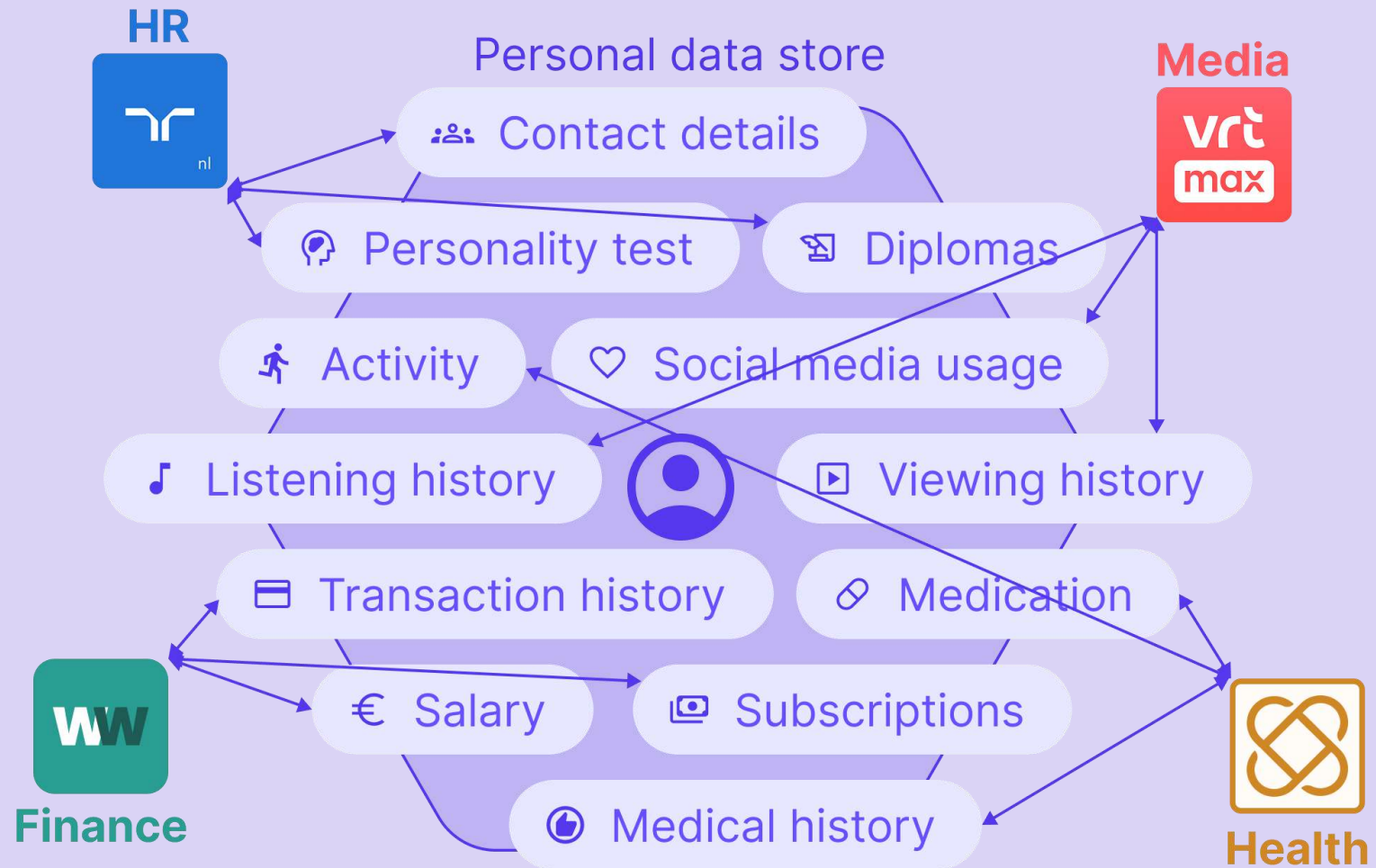
- Low user interest
- Lack of tangible experiences
- Trust concerns regarding PDS providers
- Fear of complex usability
- Perceived time burden
- Concerns about PDS security and hacking
- Expected financial costs



Methodology



Four use case scenarios



Four use case scenarios



HR

An online **career platform** uses data available in the PDS to **match candidates with relevant jobs** more effectively by accessing relevant career data with user permission.



Media

A **streaming service** requests access to relevant data in the PDS to enable enhanced, more **personalized recommendations**.



Finance

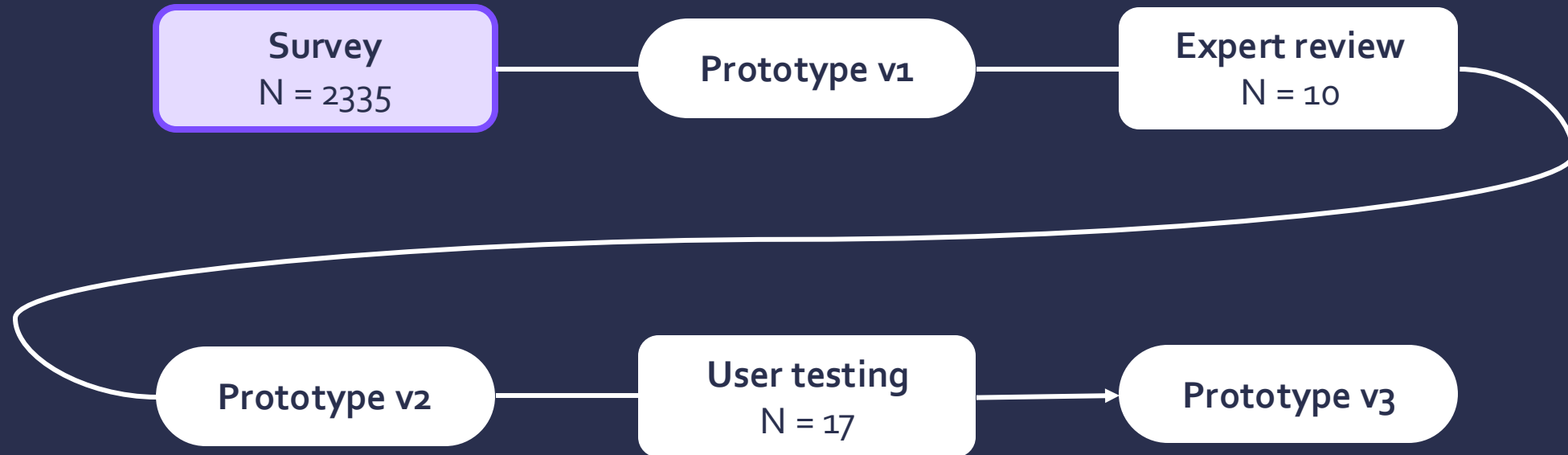
A **financial dashboarding platform** leverages PDS data to provide users with a **complete overview of their finances** across banks and investment platforms, helping them track income, expenses, and assets to achieve their financial goals.



Health

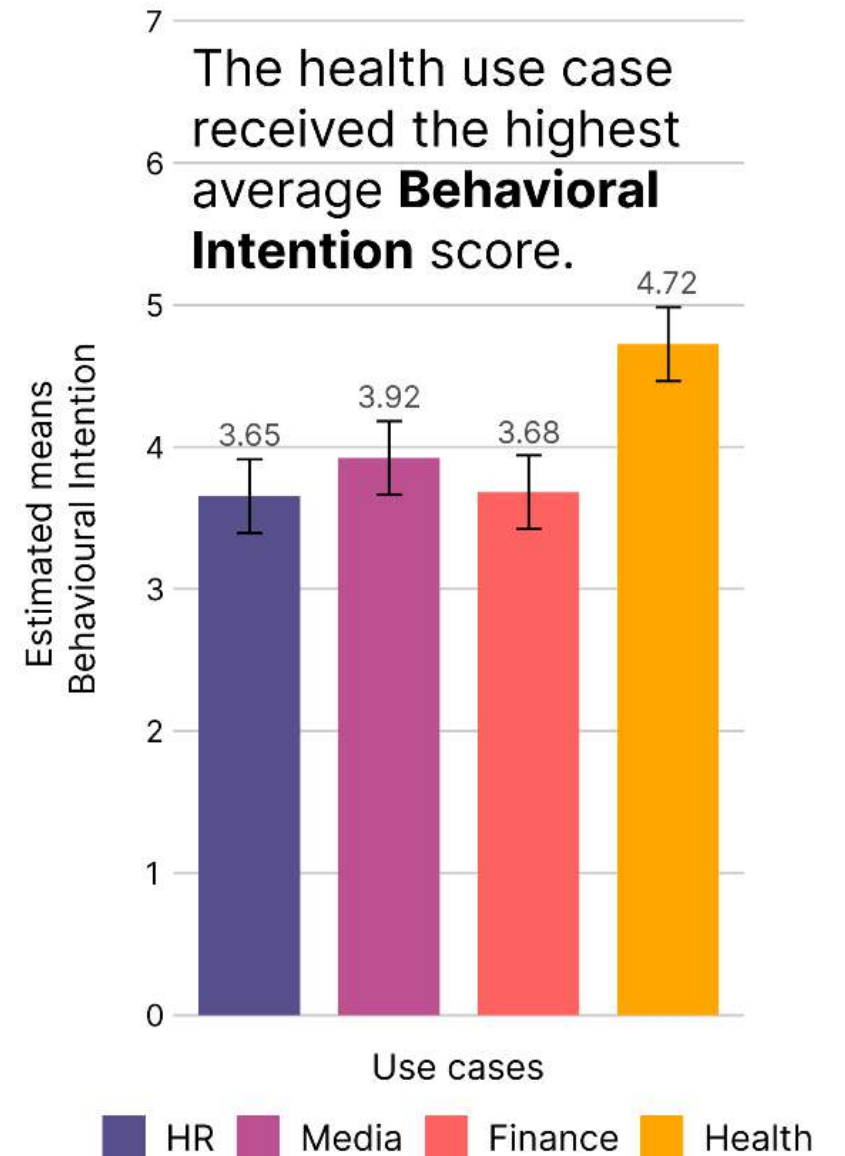
A health platform enables users to **share data** from their PDS **with doctors**, supporting more informed and **personalized health monitoring**.

Methodology

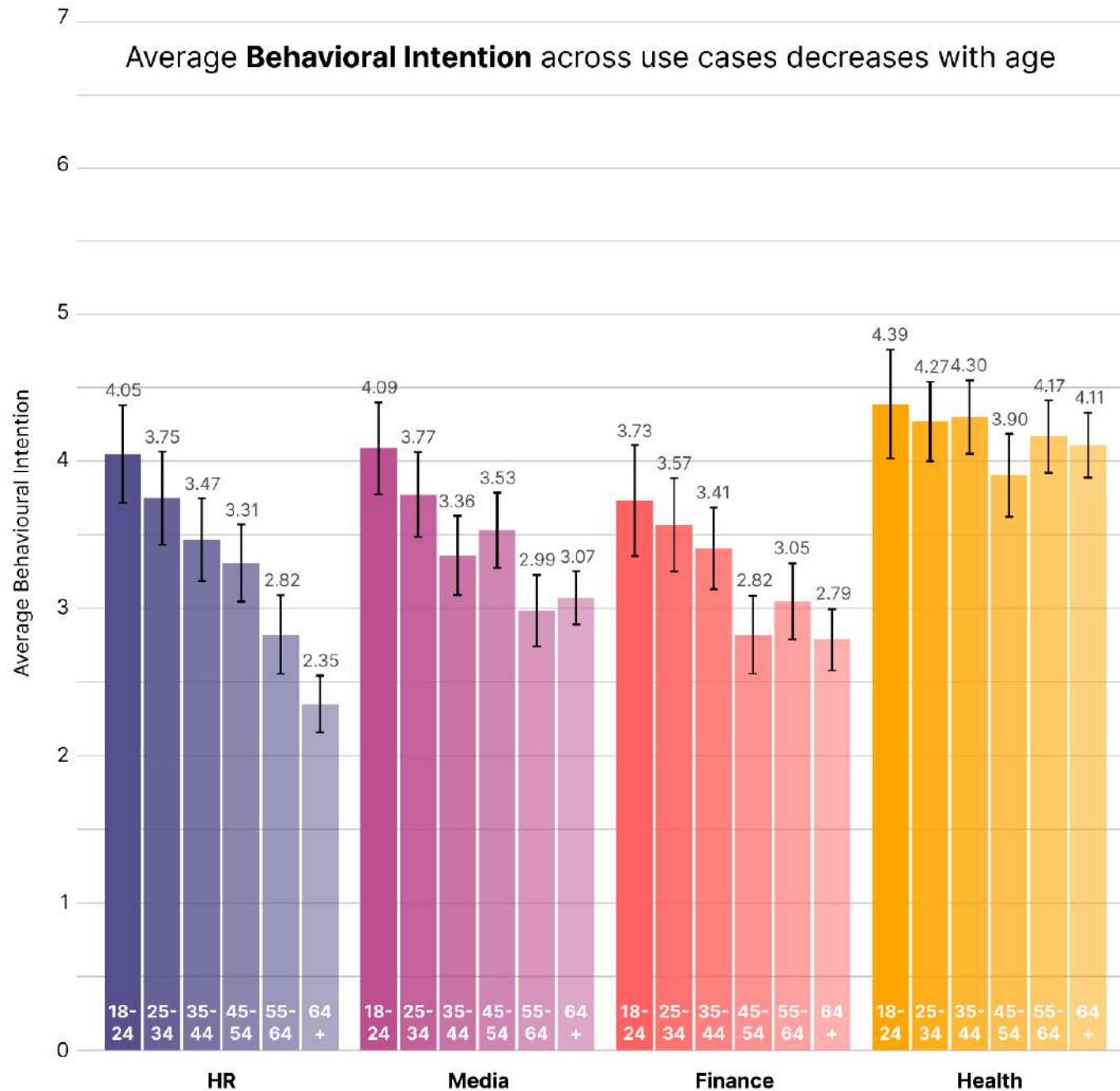


Survey

- Evaluated the use cases based on a written scenario
- 2335 participants
- All 18+ years (average age = 51 years)
- Flanders

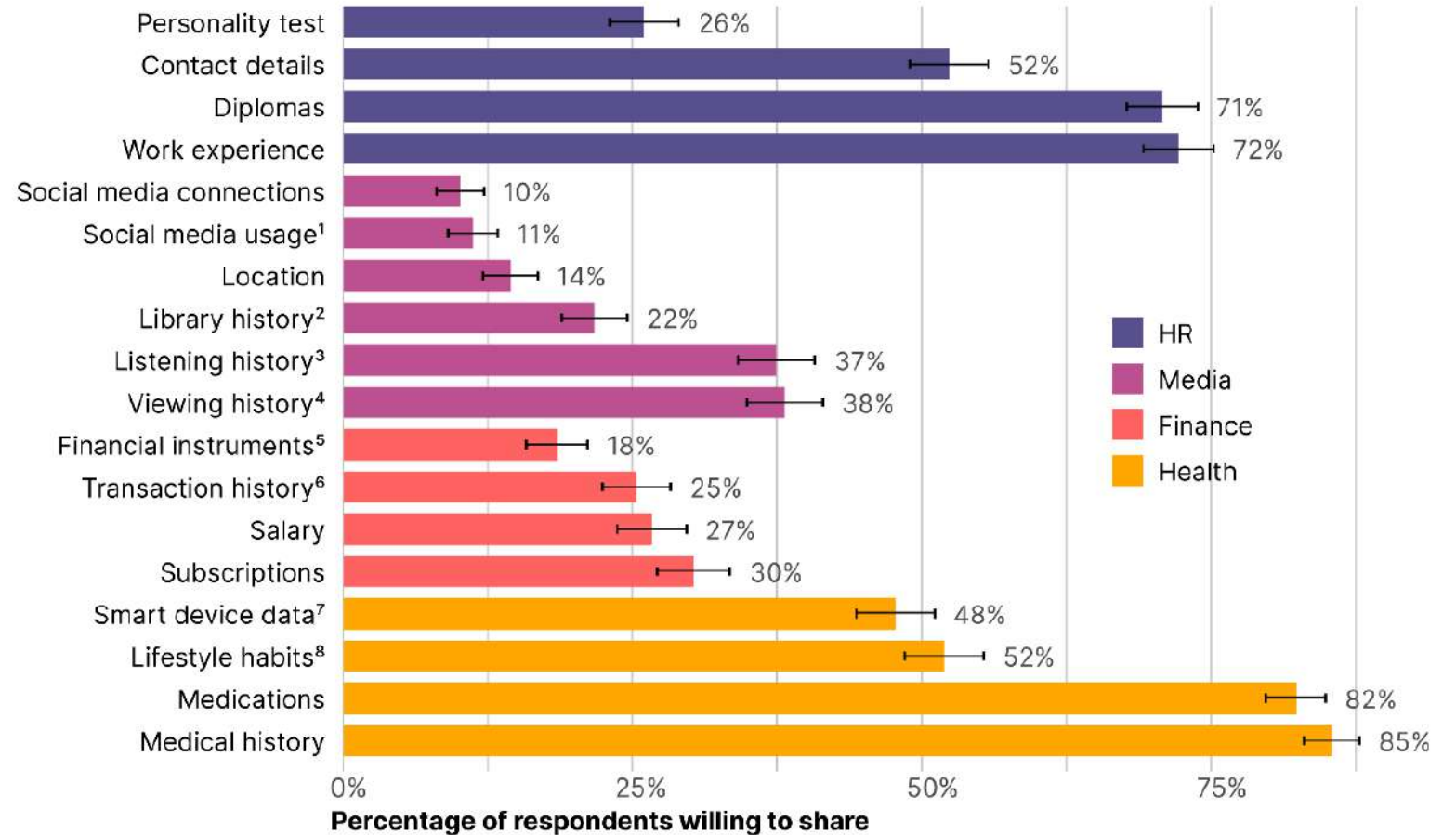


Interest in the uses cases decreases with age



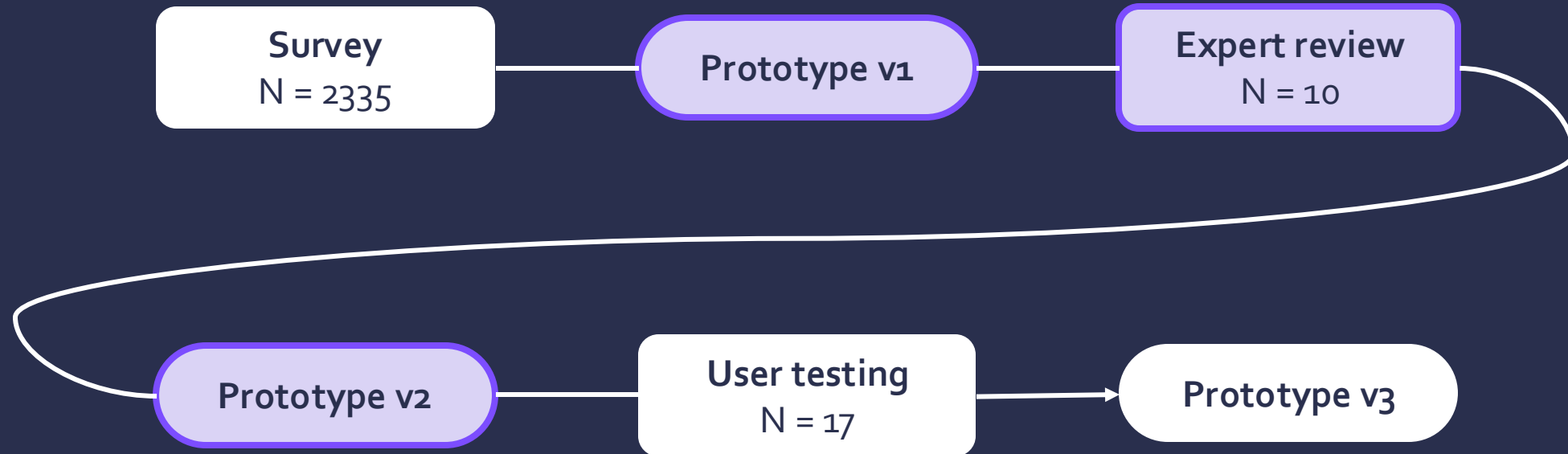
The willingness to share appears to be use case dependent rather than related to data sensitivity

Willingness to share data varies significantly across different use cases.



¹following pages and saved posts; ²books borrowed; ³music and podcasts listened to; ⁴series/films watched online; ⁵stocks, funds, crypto, etc.; ⁶purchases, expenses; ⁷heart rate, weight, sleep measurements; ⁸workouts, smoking, alcohol consumption

Methodology



Personal Data Store

The screenshot shows a web browser with several tabs: Home, Randstad, VRTMAX, WealthWise, and MyHealth. The address bar shows 'info.me'. The page features a user profile for Alex Wilder (Web.id/AlexWilder) with a dog's head as a profile picture. On the left, there are links for 'My data' and 'Permission manager'. The main content area is titled 'My data' and includes a row of icons for Personal, Work & Study, Mobility, Financial, Body & Health, Media, and Caler. Below this is a row of buttons for Identity, Address, and Contact. The 'Identity' section is expanded, showing a 'Digital ID' provided by Mijn Burgerprofiel. The details include: Name (Given names: Alex Wilder), Sex (V), Nationality (BEL), Date of birth (25/11/1998), and National register N° (25.11.98-293.28). There is a trash icon and an 'Add an ID +' button. The 'Address' section is partially visible, showing a 'Domicile' provided by Mijn Burgerprofiel with fields for Street and Number.

Personal Data Store

Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

info.me

Alex Wilder
Web.id/AlexWilder

My data
Permission manager

My data

Personal Work & Study Mobility Financial Body & Health Media Caler

Identity Address Contact

Diplomas

Select the diplomas you want to add

BSc. Business Administration

Provided by LED database

Degree Bachelor Field of study Business Administration

Institution Ghent University Grade Cum Laude

Date of issue 30/06/2020

Add selected diplomas

Cancel

Work experience

Personal Data Store

Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

info.me

Alex Wilder
Web.id/AlexWilder

My data
Permission manager

My data

- Personal
- Work & Study
- Mobility
- Financial
- Body & Health
- Media
- Caler

Music Streaming Books

Music

Your top artists

Today 1W 1M 1Y

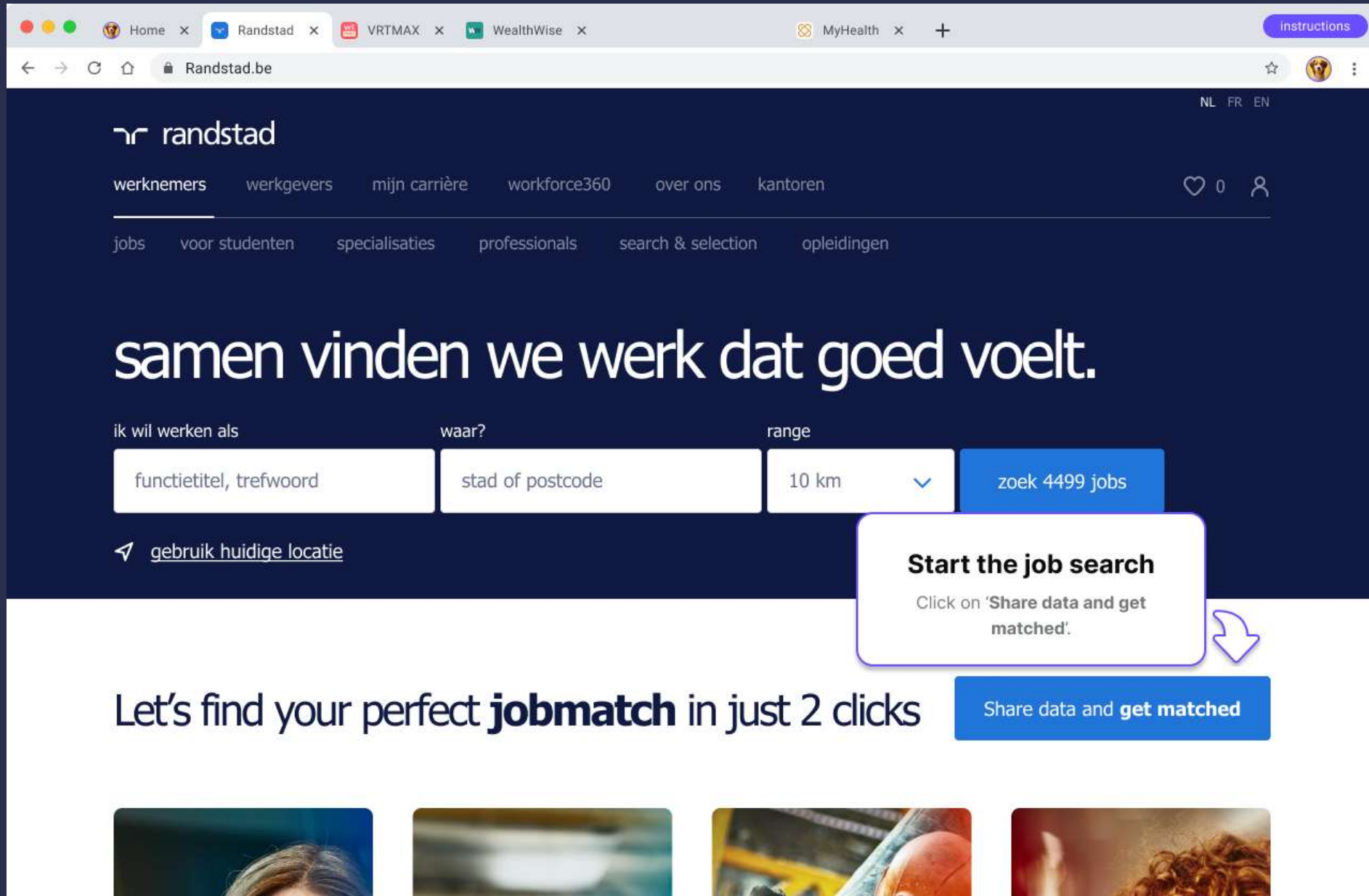
Parcels The war on drugs Foo Fighters Eminem ABBA

Connect more services +

Which service would you like to connect?

Spotify Soundcloud YouTube music

Streaming



The screenshot shows the Randstad website interface. At the top, there is a navigation bar with the Randstad logo and the text "randstad". Below this, there are several menu items: "werknemers", "werkgevers", "mijn carrière", "workforce360", "over ons", and "kantoren". There are also icons for a heart and a person. Below the navigation bar, there are more menu items: "jobs", "voor studenten", "specialisaties", "professionals", "search & selection", and "opleidingen". The main heading is "samen vinden we werk dat goed voelt." Below this, there is a search form with three input fields: "ik wil werken als" (containing "functietitel, trefwoord"), "waar?" (containing "stad of postcode"), and "range" (containing "10 km"). There is a blue button labeled "zoek 4499 jobs". Below the search form, there is a link "gebruik huidige locatie". A callout box with a purple border and arrow points to a blue button labeled "Share data and get matched". The callout box contains the text "Start the job search" and "Click on 'Share data and get matched'". Below the callout box, there is a large blue button labeled "Share data and get matched". At the bottom of the page, there are four small images showing people and industrial settings.

Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

Randstad.be

NL FR EN

randstad

werknemers werkgevers mijn carrière workforce360 over ons kantoren

jobs voor studenten specialisaties professionals search & selection opleidingen

samen vinden we werk dat goed voelt.

ik wil werken als waar? range

functietitel, trefwoord stad of postcode 10 km

zoek 4499 jobs

gebruik huidige locatie

Start the job search
Click on 'Share data and get matched'.

Let's find your perfect **jobmatch** in just 2 clicks

Share data and **get matched**



HR

The screenshot shows the Randstad website interface. At the top, there are navigation links: [werknemers](#), [werkgevers](#), [mijn carrière](#), [workforce360](#), [over ons](#), and [kantoren](#). Below these are more links: [jobs](#), [voor studenten](#), [specialisaties](#), [professionals](#), [search & selection](#), and [opleidingen](#). The main heading reads "samen vinden we werk dat goed". Below this is a search section with three input fields: "ik wil werken als" (containing "functietitel, trefwoord"), "waar?" (containing "stad of postcode"), and "range" (containing "10 km"). There is a link "gebruik huidige locatie". The bottom part of the page says "Let's find your perfect **jobmatch** in just 2 clicks".

Overlaid on the right side is a white modal window titled "Randstad requests access to the following data". It features a "Change acc." button, a "Select all" button, and four data categories, each with a toggle switch:

- Diploma**: BSc. Business Administration
- Work experience**: Past and current jobs
- Personality test results**: Kazi talent expectations scan
- City of residence**: Ghent

At the bottom of the modal, there is a "Job matching" section with filters for "1D", "1M", and "1Y", and a prominent "Share" button. A callout box points to the "Share" button with the text "Share the data" and "Click on the 'Share'".

Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

Randstad.be

NL FR EN

randstad

werknemers werkgevers mijn carrière workforce360 over ons kantoren

jobs voor studenten specialisaties professionals search & selection opleidingen

home > vacatures > administratie

trefwoord of titel locatie of postcode 10 km zoek 272 jobs

opslaan als job alert

3 vacancies found that **match with your profile**

datum ↕

administratief bediende



- zele, oost-vlaanderen
- tijdelijk met uitzicht op vast
- €2,200 - €3,000 per maand

93% Match



- ✓ Diploma requirements
- ✓ 3+ years work experience

account payable officer



- Gent, oost-vlaanderen
- tijdelijk
- deme dredging

87% Match



- ✓ Diploma requirements
- ✓ 1+ years work experience

bank officer



- Gent, oost-vlaanderen
- tijdelijk

82% Match



- ✓ Diploma requirements
- ✓ 3+ years work experience

je gaat solliciteren voor:

administratief bediende

[aanmelden om te solliciteren](#)

Vul onderstaande gegevens aan om te sollicitatie te kunnen vervolledigen.



Automatically collect data

Skip the form and have your data collected automatically

Click on 'Automatically collect data'

or

profielinformatie

e-mail

paswoord



je gaat solliciteren voor:

administratief be

aanmelden om te solliciteren

Vul onderstaande gegevens aan om te sollicitatie te kunnen vervolledigen.

 Gegevens automatisch ophalen


Change account 

Randstad requests access to the following data


Select all

Personal email ●


alexwilder@email.com

Mobile number ●


484 46 50 99

 Contact on solicitation updates


BSc. Business Administration ●

 Provided by LED database


| | |
|----------|-------------------------|
| Degree | Field of study |
| Bachelor | Business Administration |

 To verify job requirements

Digital ID ●

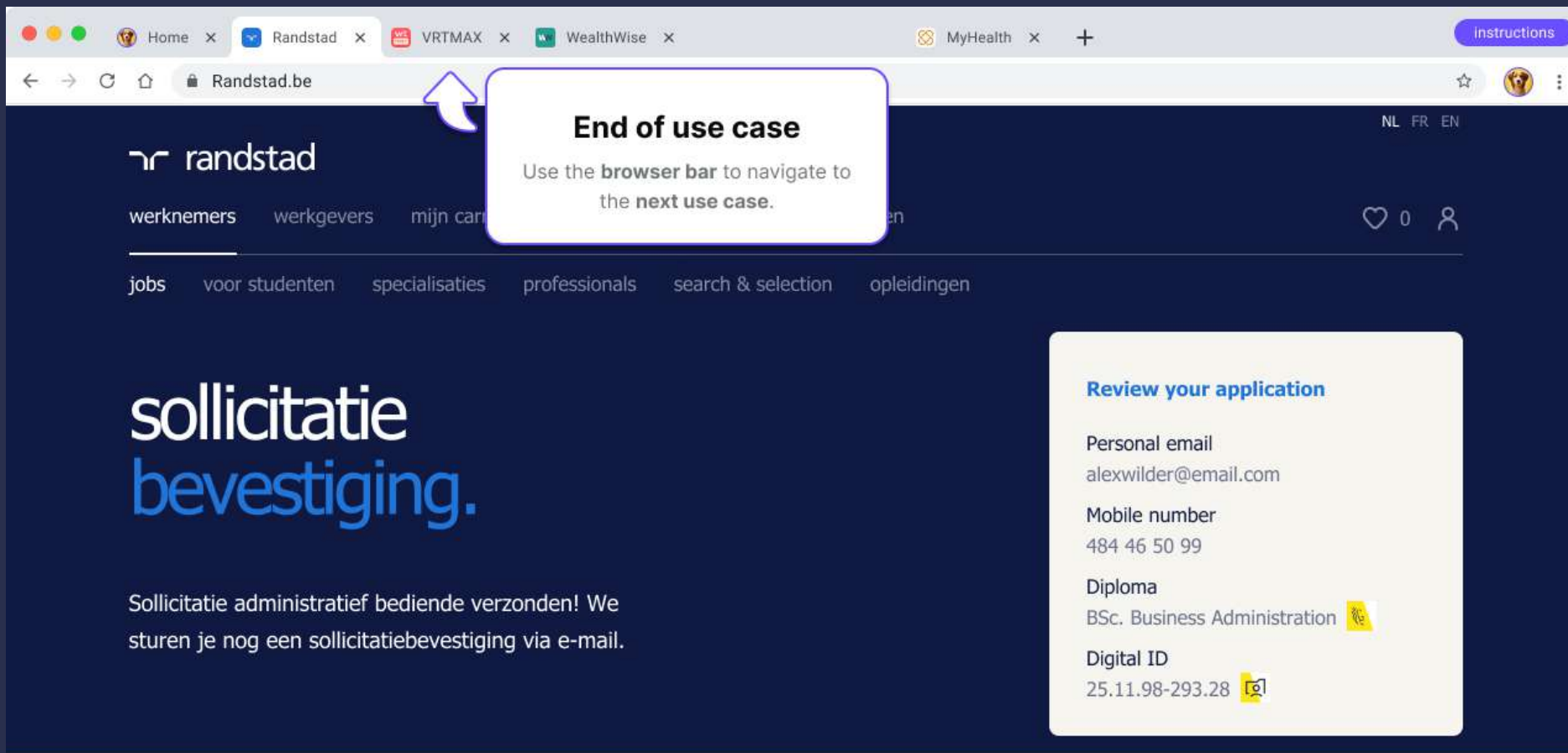
 Provided by Mijn Burgerprof...

| | | |
|-----------------------------|--------------------|----------------------|
| Name | | Given names |
| Alex | Wilder | |
| Sex | Nationality | Date of birth |
| V | BEL | 25/11/1998 |
| National register N° | | |
| 25.11.98-293.28 | | |

 Profile creation, Identity check

Untill revoked
1D
1M
1W
1Y

Cancel
Share



End of use case
Use the **browser bar** to navigate to the **next use case**.

sollicitatie bevestiging.

Sollicitatie administratief bediende verzonden! We sturen je nog een sollicitatiebevestiging via e-mail.

Review your application

- Personal email
alexwilder@email.com
- Mobile number
484 46 50 99
- Diploma
BSc. Business Administration
- Digital ID
25.11.98-293.28



Browser tabs: Home, Randstad, VRTMAX, WealthWise, MyHealth

URL: vrtmax.be

Navigation: Home, Mijn lijst, Radio- en TV-gids, Zomerhit, Paralympische Spelen

KANALEN: VRT 1, VRT CANVAS, MNM, Studio Brussel

ONTDEKKEN: Radio, Podcasts, TV, Series, Films, Docu's, Sport, Muziek

Meest bekeken films: GOSFORD PARK

03 06 08 20
DAGEN UREN MIN SEC

thuis

Het nieuwe seizoen komt eraan, maar waar waren we gebleven? Christine vat het voor je samen.

VRTMAX requests access to the following data

Select all

- Streaming history**
Recently watched series and movies
- Following pages and accounts**
Pages you follow or like
- Music interests**
Listening history, favourite artists
- Friends**
Contacts labelled as 'friend'
- Library borrowing history**
Books you borrowed
- City of residence**
Ghent

Personalized recommendations

Untill revoked | 1D | 1M | 1W | 1Y

Cancel | Share



Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

vrtmax.be

vr̄t max

Q Waar ben je naar op zoek? Kids ontdekken

Home

Mijn lijst

Radio- en TV-gids

Zomerhit

Paralympische Spelen

KANALEN

VRT 1

VRT CANVAS

MNM

Studio Brussel

ONTDEKKEN

Radio

Podcasts

TV

Series

Films

Docu's

Sport

Muziek

Personalized recommendations

Based on Streaming history x Music interests x Following pages and accounts x Library borrowing history

MARLEY
Because you follow Bob Marley

Becoming
Because you read Michelle Obama

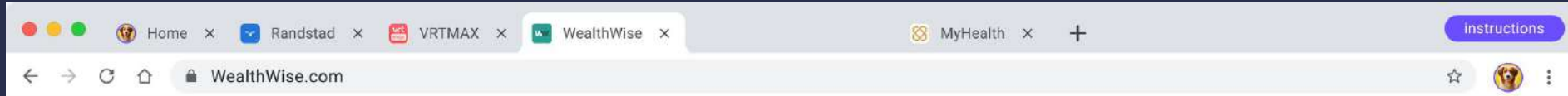
NASA
A JOURNEY THROUGH SPACE
Because you follow Nasa

TAYLOR SWIFT
Because you follow Taylor Swift

Series your friends liked

zomerhit

GOSFORD PARK



ww WealthWise

Let us help you make informed financial decisions.

Hi, **Alex**
to provide insights into your
finances, we'd like access to
some of your data.



 Select data for sharing


ww WealthWise

Let us help you make informed financial decisions.

Hi, Alex
to provide insights into your finances, we'd like access to some of your data.






 Select data for sharing

 [Change acc.](#)

WealthWise
requests access to the following data

[Select all](#)

- Financial transactions**
Transactions for connected cards

- Stocks**
Your investments 
- Income/Expenses**
Pay slips, subscriptions 

Generating financial dashboard & insights

[Until revoked](#) 1D 1M 1Y


[Cancel](#) [Share](#)


Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

← → ↻ 🏠 WealthWise.com ☆ 👤 ⋮

WW Hello Alex >> Aug 27, 2024 🔔 Search here 🔍

Total Balance

€18,399 All Accounts 


Account Type
Credit Card
***** 3846 **€6,147** 

< Previous ● ● ● Next >


Monthly fixed costs (e.g. rent)

€827.32 Fixed Costs Aug, 2024

Fixed costs **€827.32**

Salary  **€2,353.32**

€827 fixed costs vs salary



Upcoming Bills

View All >

- Sep 15 **Netflix - Monthly** €9.99
Last Charge - 14 Aug, 2024
- Sep 16 **Spotify - Monthly** €10.99
Last Charge - 17 Aug, 2024

Recent Transaction


View All >

All Revenue Expenses

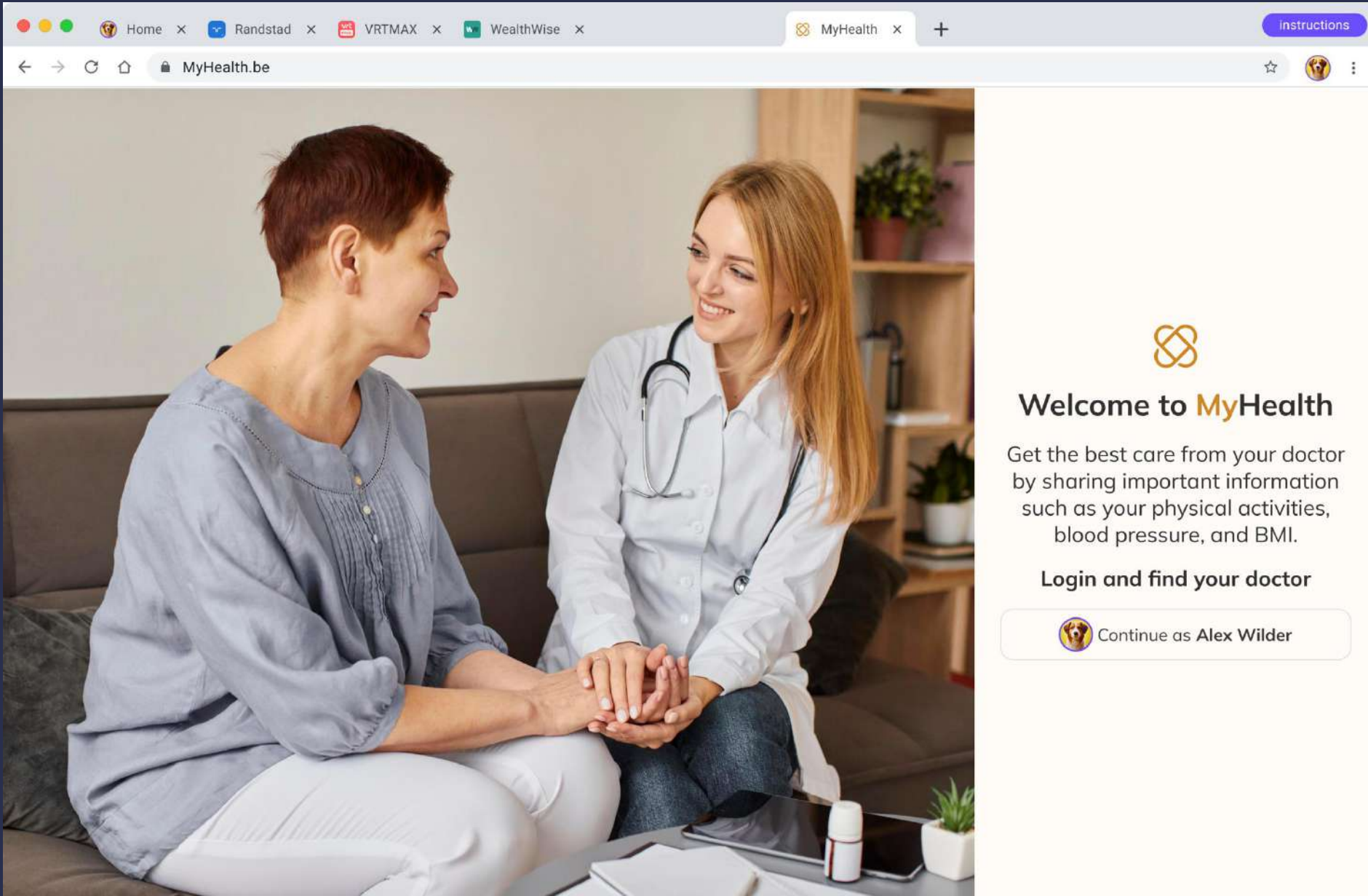
- Pizza Barnaby** €16.50
Food & drinks 26 Aug 2024
- Amnesty Int.** €15.00
Charity 26 Aug 2024
- Marthe Tijs** €4.00
Personal 26 Aug 2024

Income/expenses

Monthly Comparison




| Month | Income (€) | Expenses (€) |
|-------|------------|--------------|
| Feb | ~3800 | ~3000 |
| Mar | ~2200 | ~1400 |
| Apr | ~2200 | ~1500 |
| May | ~2200 | ~2200 |
| Jun | ~3200 | ~2500 |
| Jul | ~3800 | ~1500 |
| Aug | ~2200 | ~1500 |



Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions


MyHealth.be

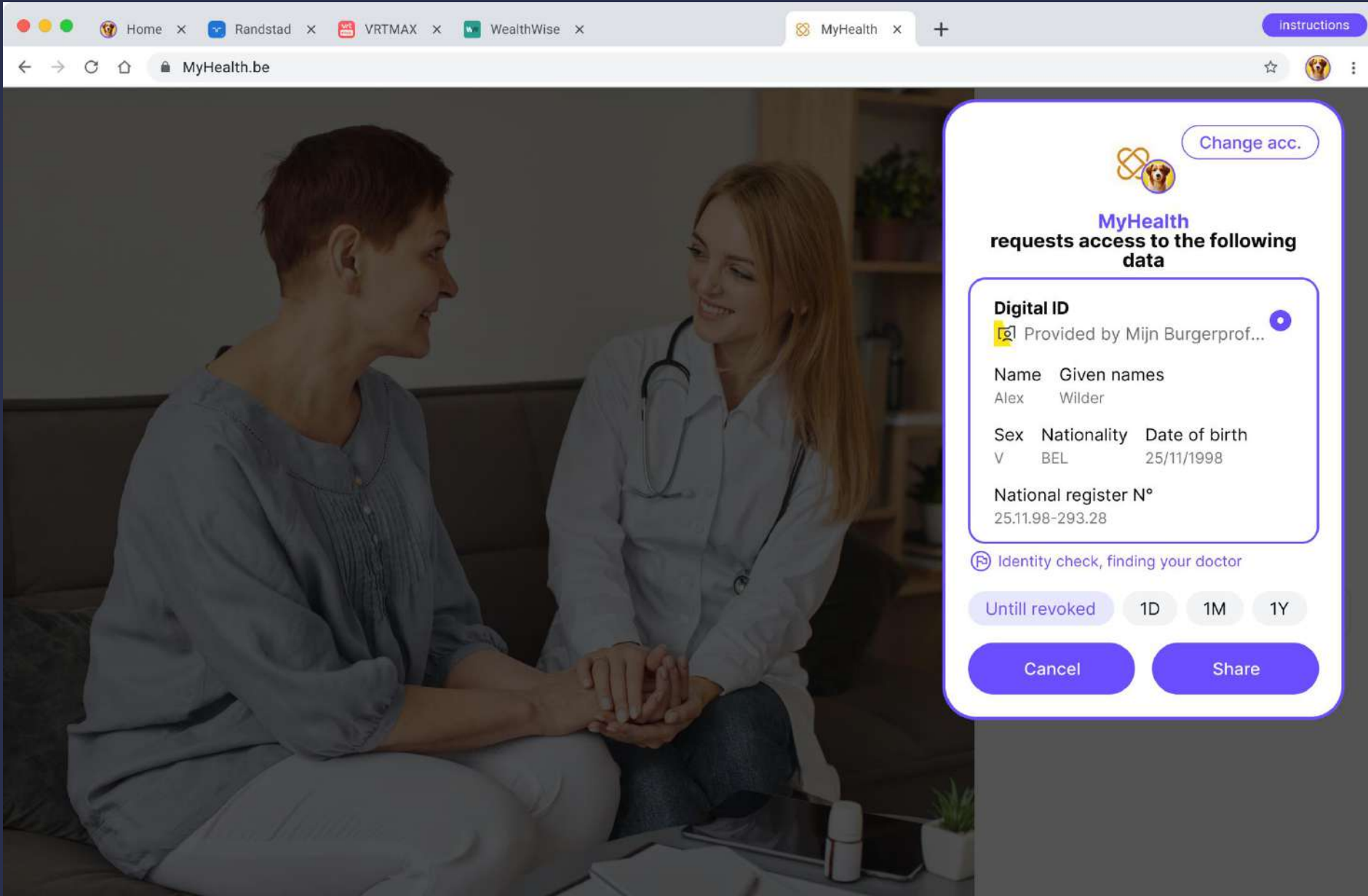


Welcome to MyHealth

Get the best care from your doctor by sharing important information such as your physical activities, blood pressure, and BMI.

Login and find your doctor

 Continue as Alex Wilder



Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

MyHealth.be

Change acc.

MyHealth
requests access to the following data

Digital ID
Provided by Mijn Burgerprof...

Name Given names
Alex Wilder

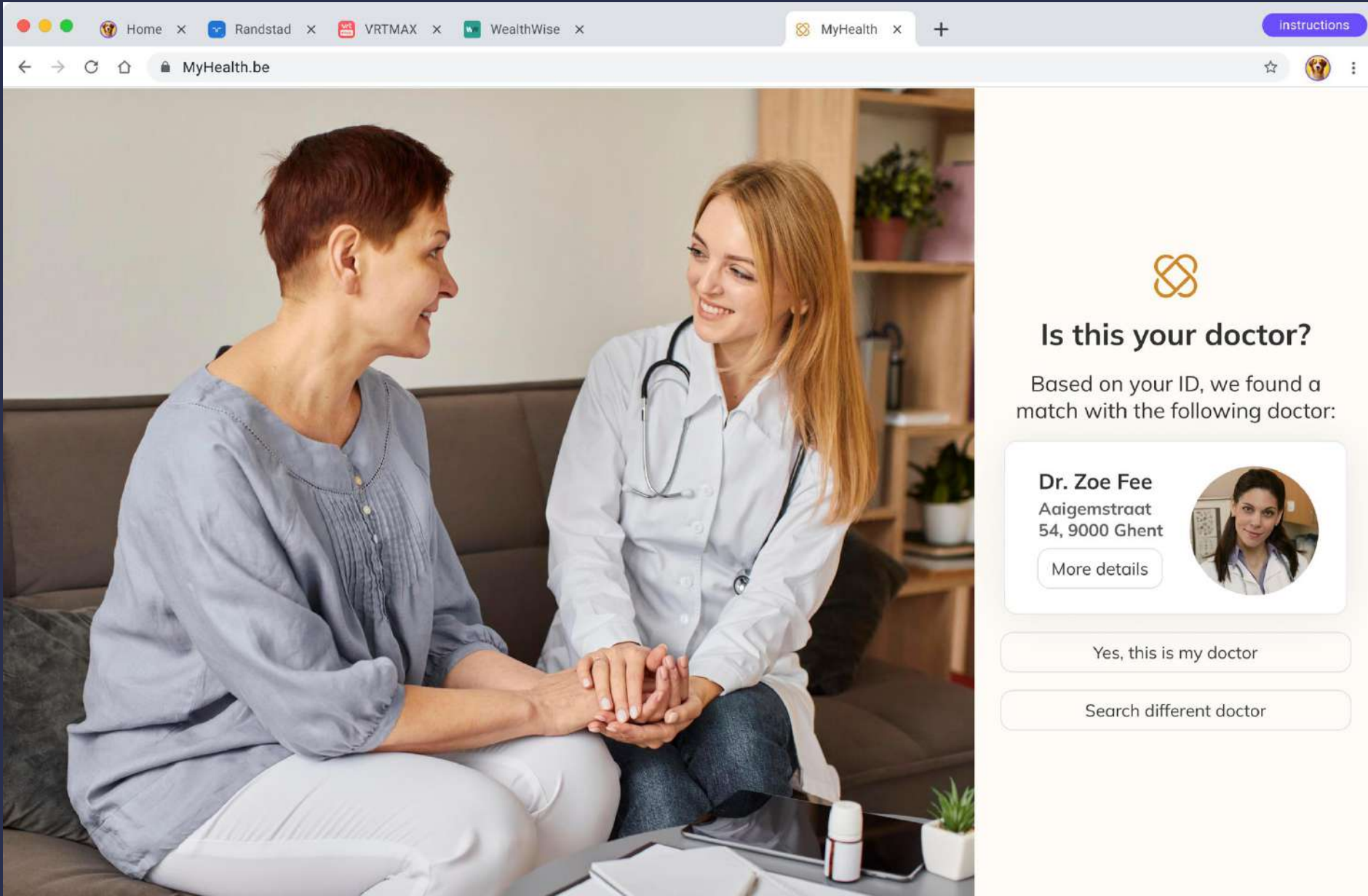
Sex Nationality Date of birth
V BEL 25/11/1998

National register N°
25.11.98-293.28

Identity check, finding your doctor


Until revoked 1D 1M 1Y


Cancel Share



Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

MyHealth.be






Is this your doctor?

Based on your ID, we found a match with the following doctor:



Dr. Zoe Fee
Aaigemstraat
54, 9000 Ghent

[More details](#)








[Yes, this is my doctor](#)

[Search different doctor](#)

 [Change account](#) 

Dr. Zoe Fee requests access to the following data

[Select all](#)

| | |
|--|--|
| Activity History of workouts  | Medication Current treatments  |
| Vitals Heart/respiratory rate/...  | Medical history Vaccinations, allergies and treatments  |
| Body measurements Body scan, weight and dimensions  | <input type="checkbox"/> Monitor health status |

Monitor health status

[Until revoked](#) [1D](#) [1M](#) [1W](#) [1Y](#)

[Cancel](#) [Share](#)

Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

MyHealth.be

Health Overview

August 27, 2024

Blood Sugar

90 mg / dL


It's time to visit your doctor to review your Tetanus vaccine.

Book appointment

Resting Heart Rate

58 bpm


Normal


Based on 

Blood Pressure

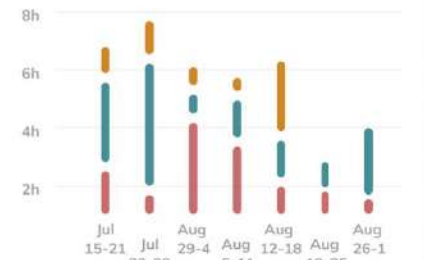
140 / 90 mmhg

Higher than usual

Based on 

Your doctor recommends a **checkup** 

Activity Weekly



● Run ● Ride ● Swim

Your doctor Edit


Dr. Zoe Fee
Aaigemstraat 54, 9000 Ghent

Contact

Upcoming consult **August 29, 2024**

Last consultation **June 14, 2024**

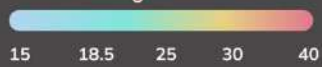
BMI Calculator

BMI 

Height **178 cm**

Weight **72 kg**

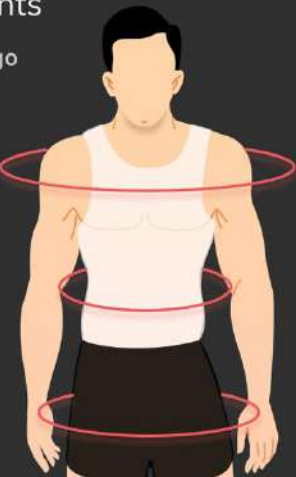
Body Mass Index (BMI) **22.7** You're Healthy



Body Measurements

Last checked 2 Days Ago

Inverted Triangle Body Shape



Chest (cm) **102** ↑

Personal Data Store

Home x Randstad x VRTMAX x WealthWise x MyHealth x + instructions

info.me

Alex Wilder
Web.id/AlexWilder

My data

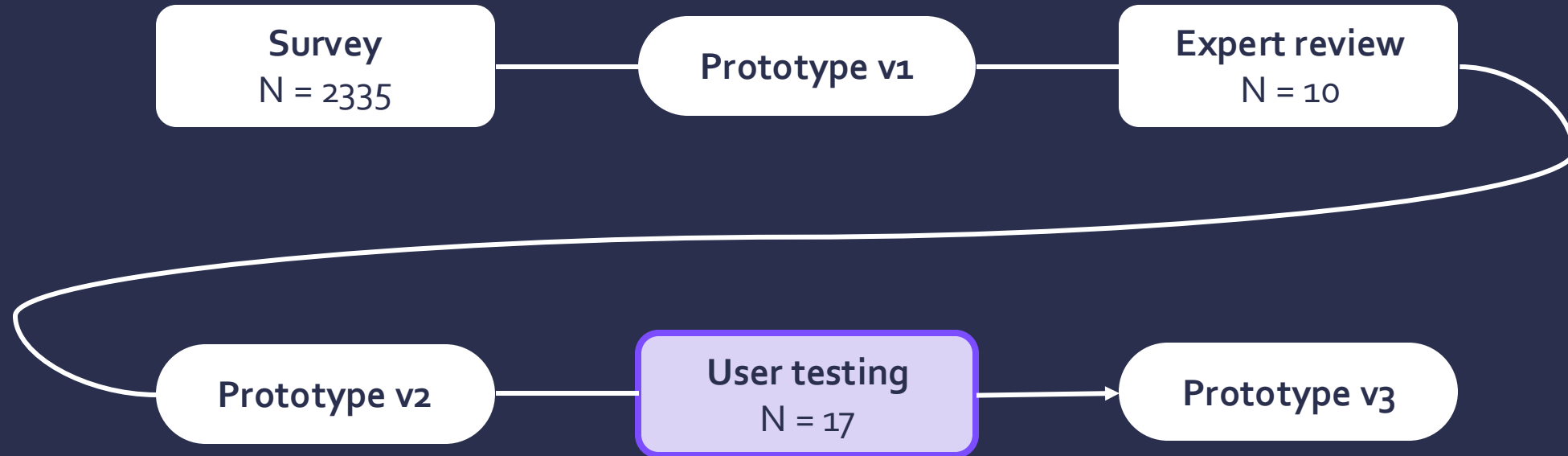
Permission manager

Permission manager

Q x Cancel Overview Advanced controls ⚙️

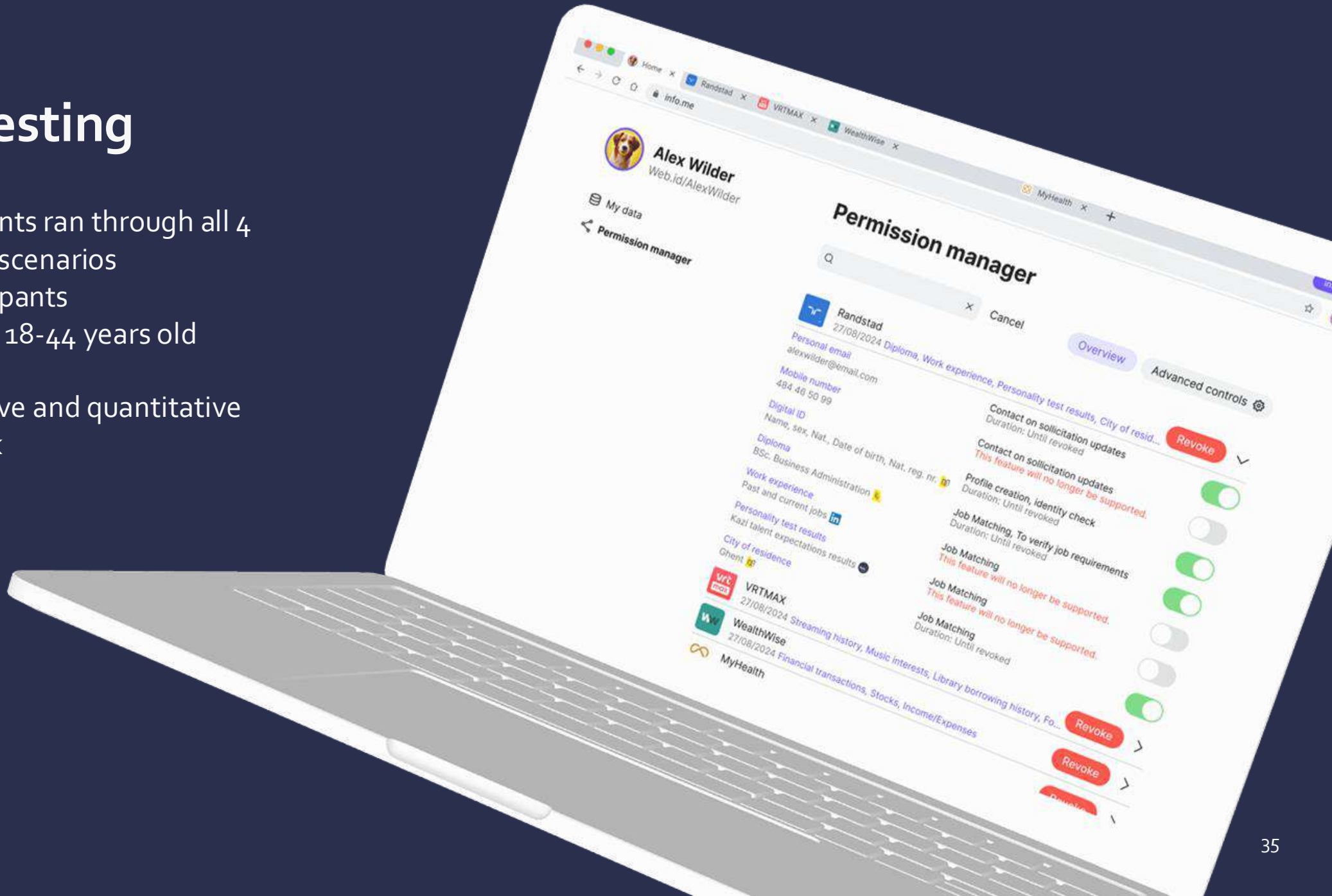
| App | Permissions | Duration | Toggle | Action |
|------------|--|---|-------------------------------------|----------|
| Randstad | Personal email alexwilder@email.com | Contact on solicitation updates Duration: Until revoked | <input checked="" type="checkbox"/> | Revoke ▾ |
| | Mobile number 484 46 50 99 | Contact on solicitation updates This feature will no longer be supported. | <input type="checkbox"/> | |
| | Digital ID Name, sex, Nat., Date of birth, Nat. reg. nr. | Profile creation, identity check Duration: Until revoked | <input checked="" type="checkbox"/> | |
| | Diploma BSc. Business Administration | Job Matching, To verify job requirements Duration: Until revoked | <input checked="" type="checkbox"/> | |
| | Work experience Past and current jobs | Job Matching Duration: Until revoked | <input checked="" type="checkbox"/> | |
| | Personality test results Kazi talent expectations results | Job Matching This feature will no longer be supported. | <input type="checkbox"/> | |
| | City of residence Ghent | Job Matching Duration: Until revoked | <input checked="" type="checkbox"/> | |
| | VRTMAX | 27/08/2024 Streaming history, Music interests, Library borrowing history, Fo... | | |
| WealthWise | 27/08/2024 Financial transactions, Stocks, Income/Expenses | | Revoke > | |
| MyHealth | 27/08/2024 Digital ID | | Revoke > | |

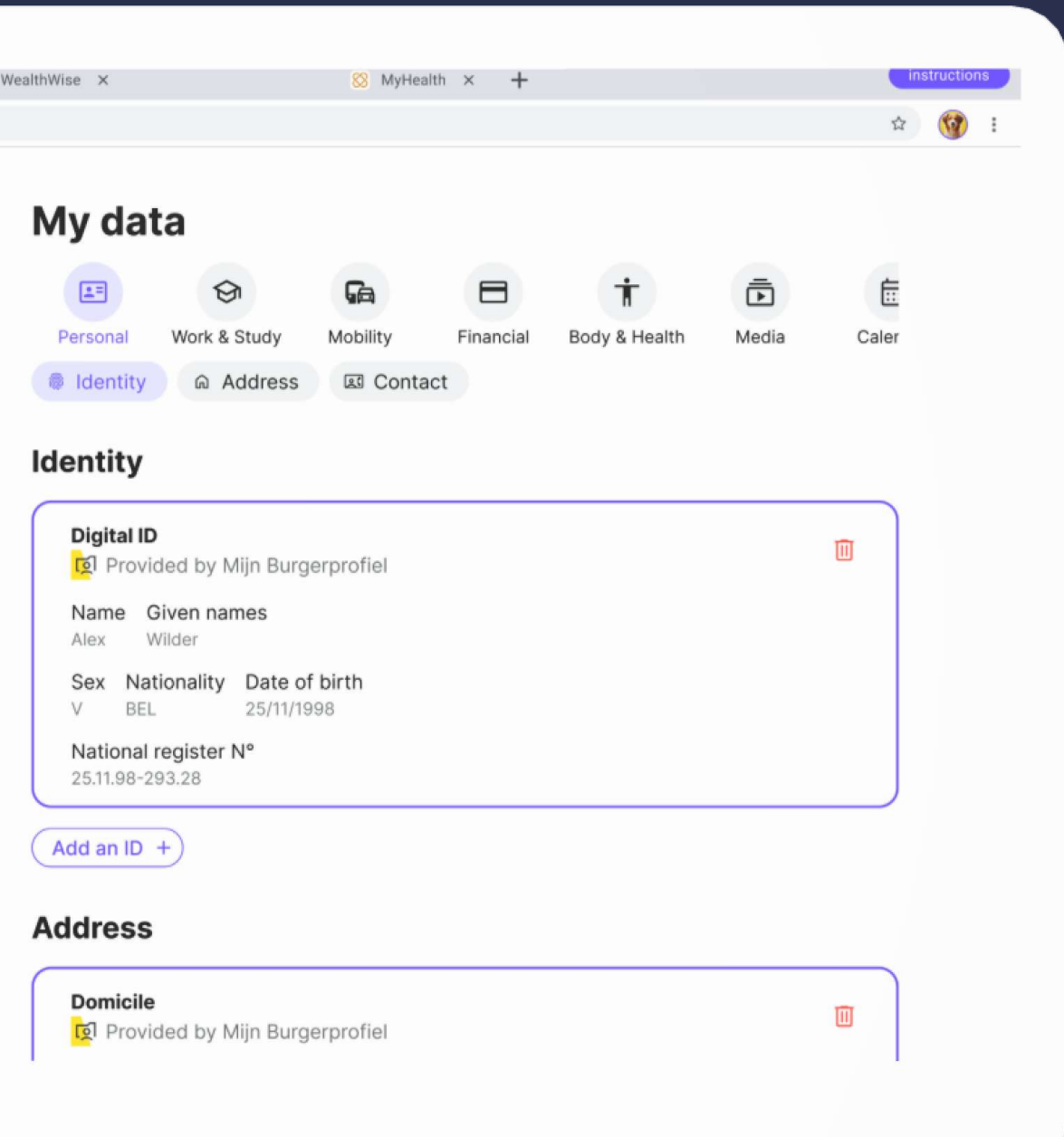
Methodology



User testing

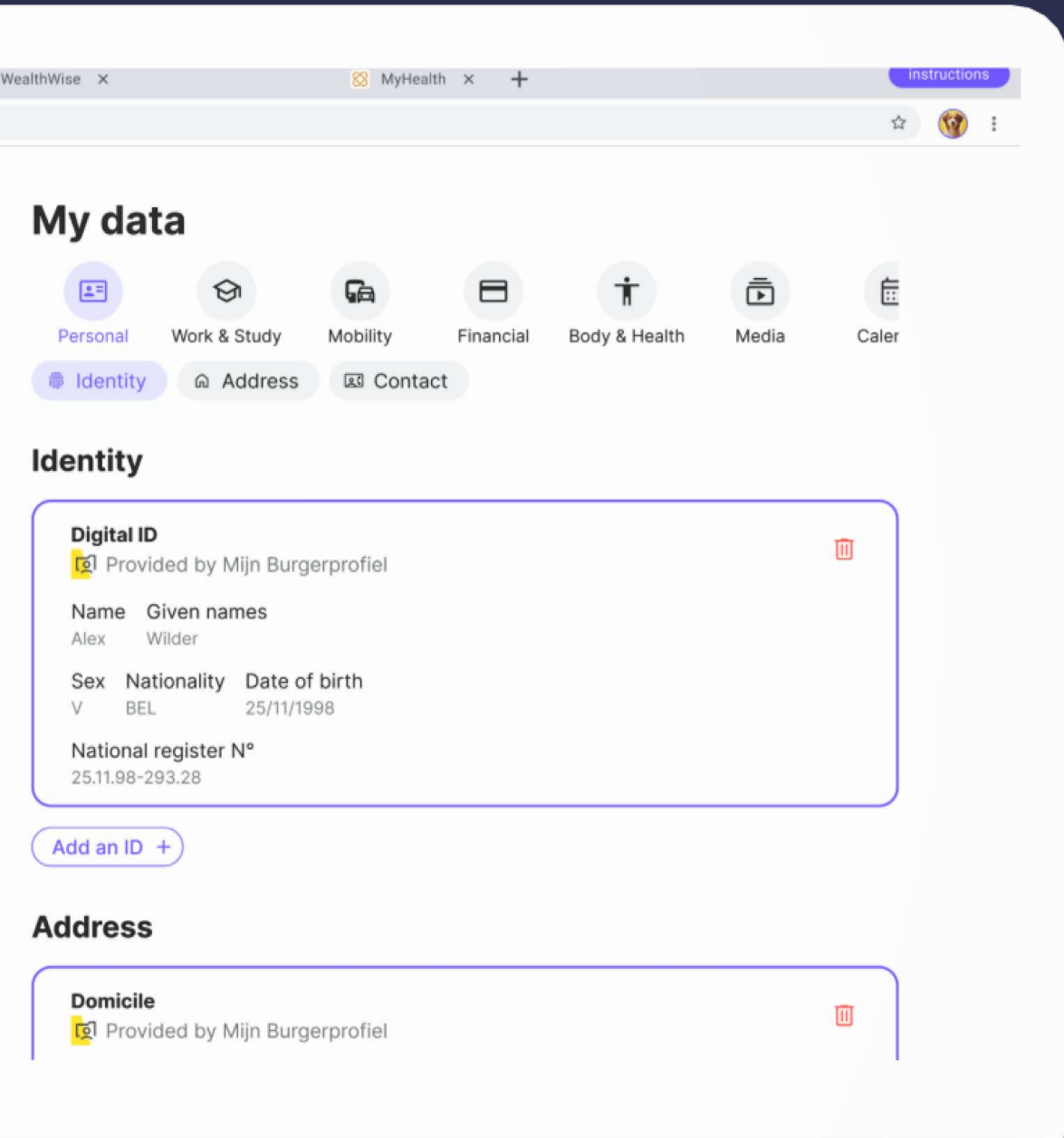
- Participants ran through all 4 use case scenarios
- 17 participants
- Between 18-44 years old
- Flanders
- Qualitative and quantitative feedback





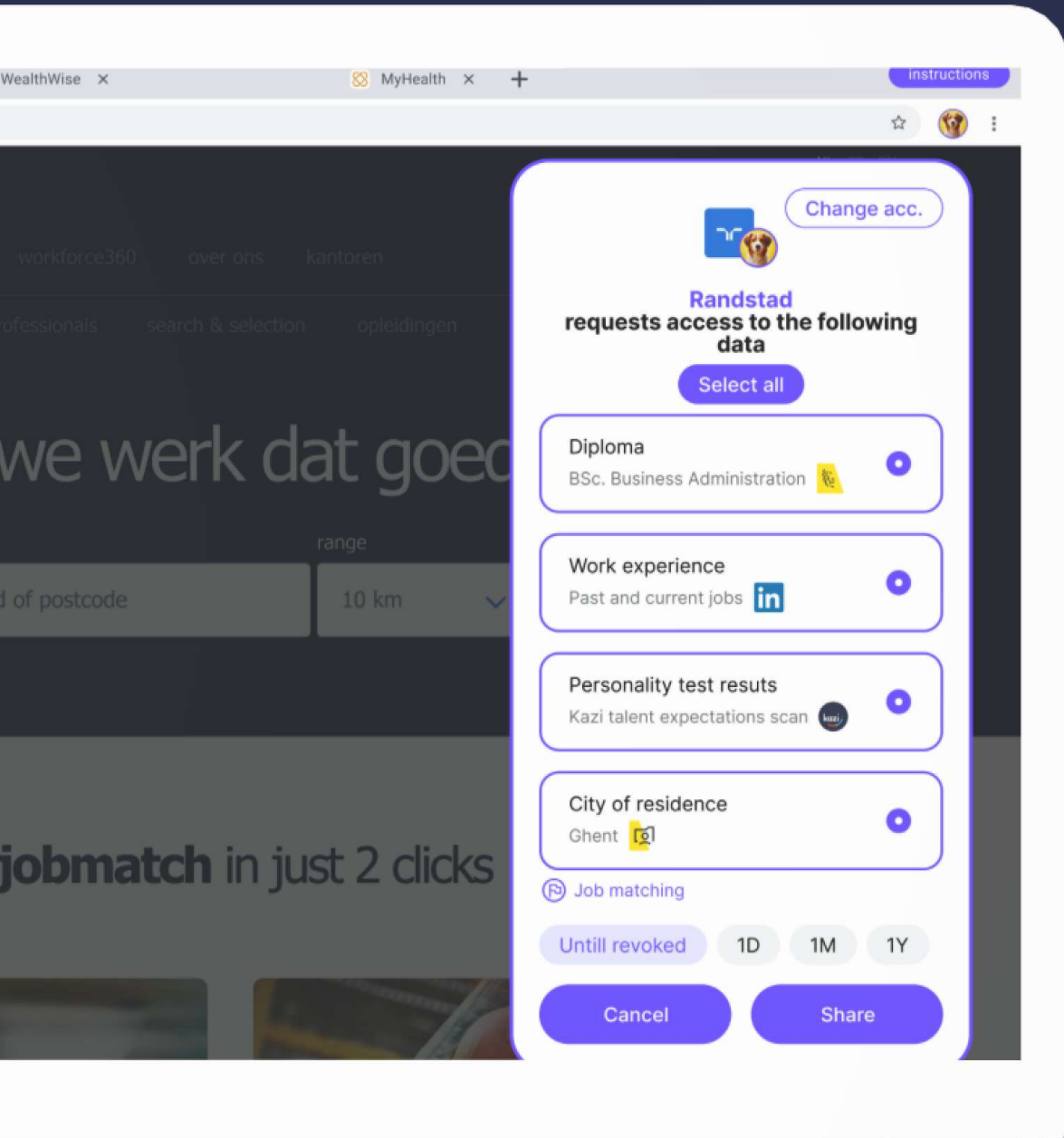
Personal Data Store

- Positive reception overall: structure and efficiency
- **Major security concerns** due to data centralization
- Trust tied to provider
 - Government affiliation seen as essential for credibility
 - But doubts about **state involvement in leisure data**
- **Permission manager** well appreciated



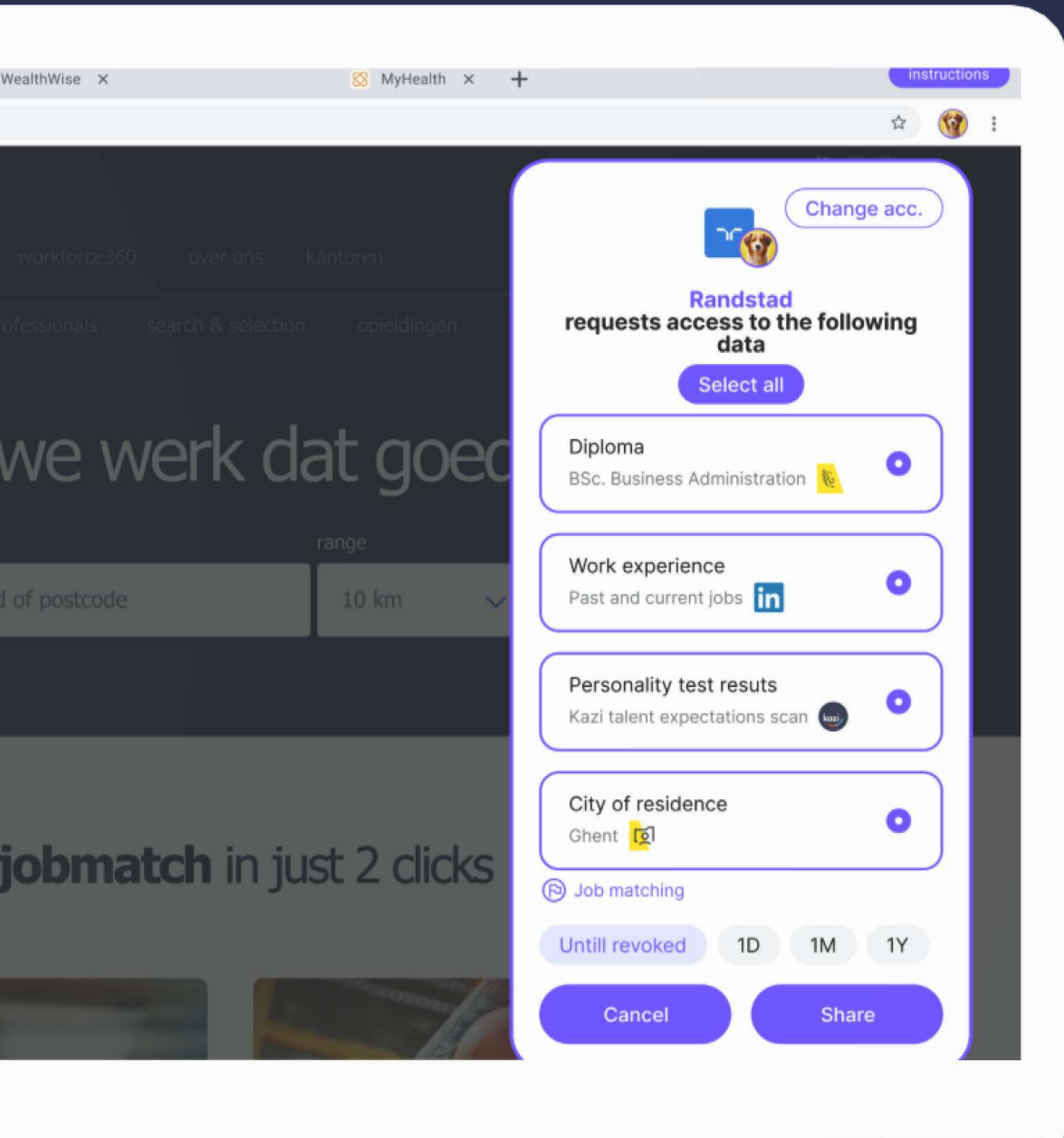
Personal Data Store

“Interesting to have that in one location instead of having 456 different apps for it.”



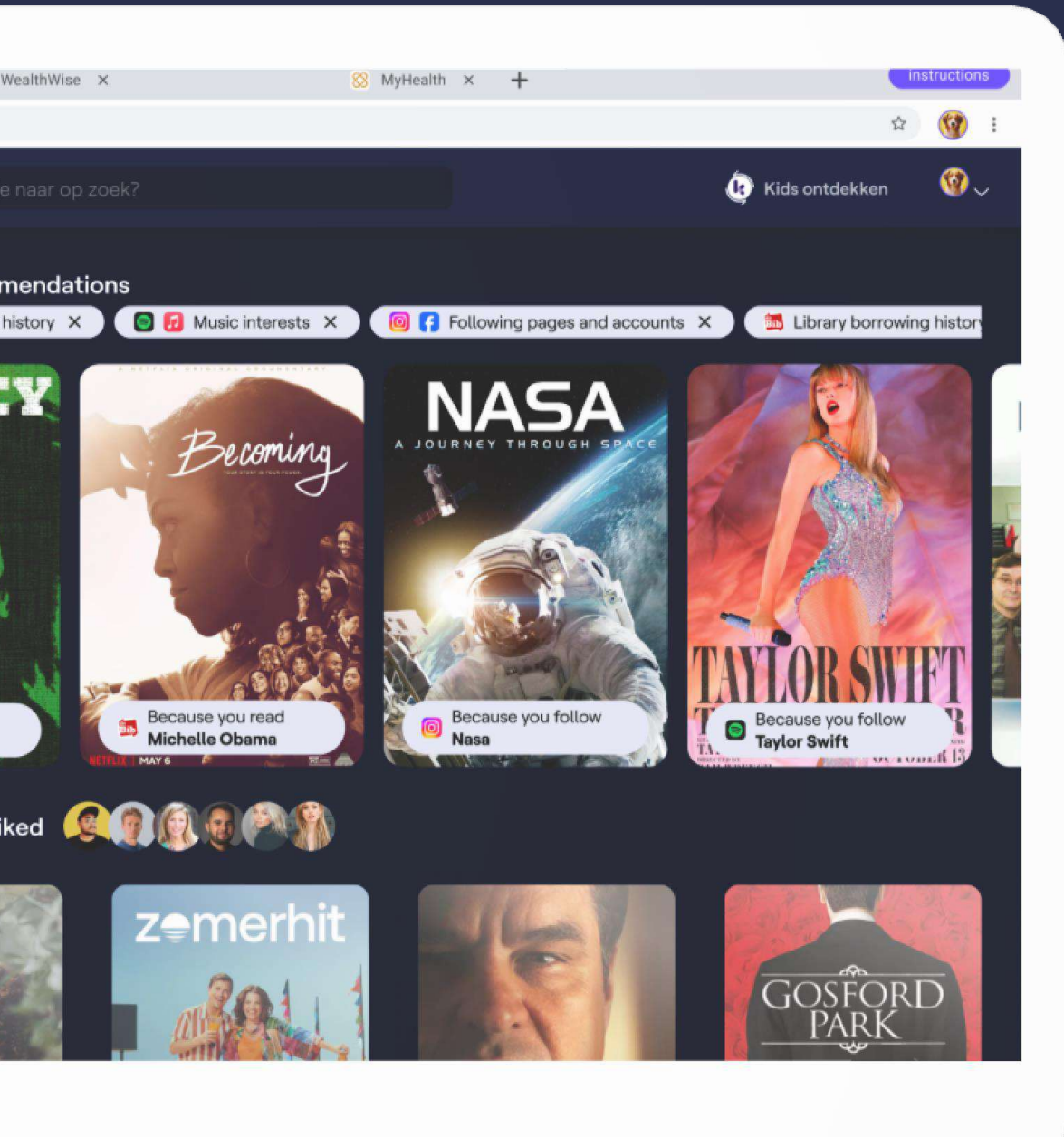
HR

- **High willingness to share data for job matching**
 - Some doubts about **personality tests, sex and age**
- Appreciation for **data minimization** (e.g. city instead of exact address)
- **Desire for more control:** filters, keyword preferences
- **Positive overall:** fast, simple, efficient



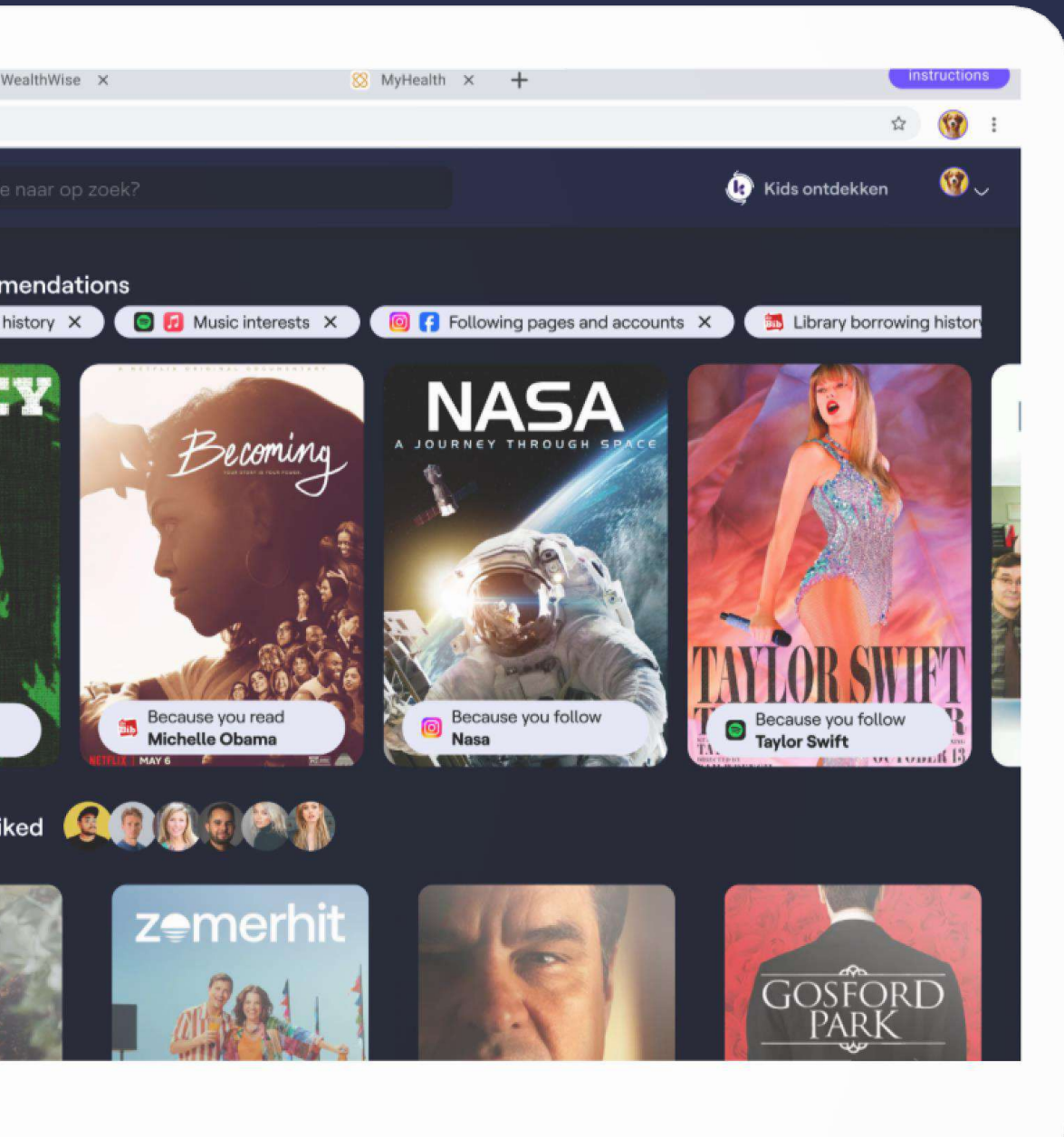
HR

"I just think it goes really fast, and it's just super simple like that. Check, check, check. [...] It's really super simple."



Media

- Initial scepticism about relevance of certain data (e.g. city, listening history)
- Strong reluctance to share social media data
- Trust in platform mattered
- Perception shifted after seeing recommendations
- Mixed reactions overall: **convenience VS fear of filter bubbles**

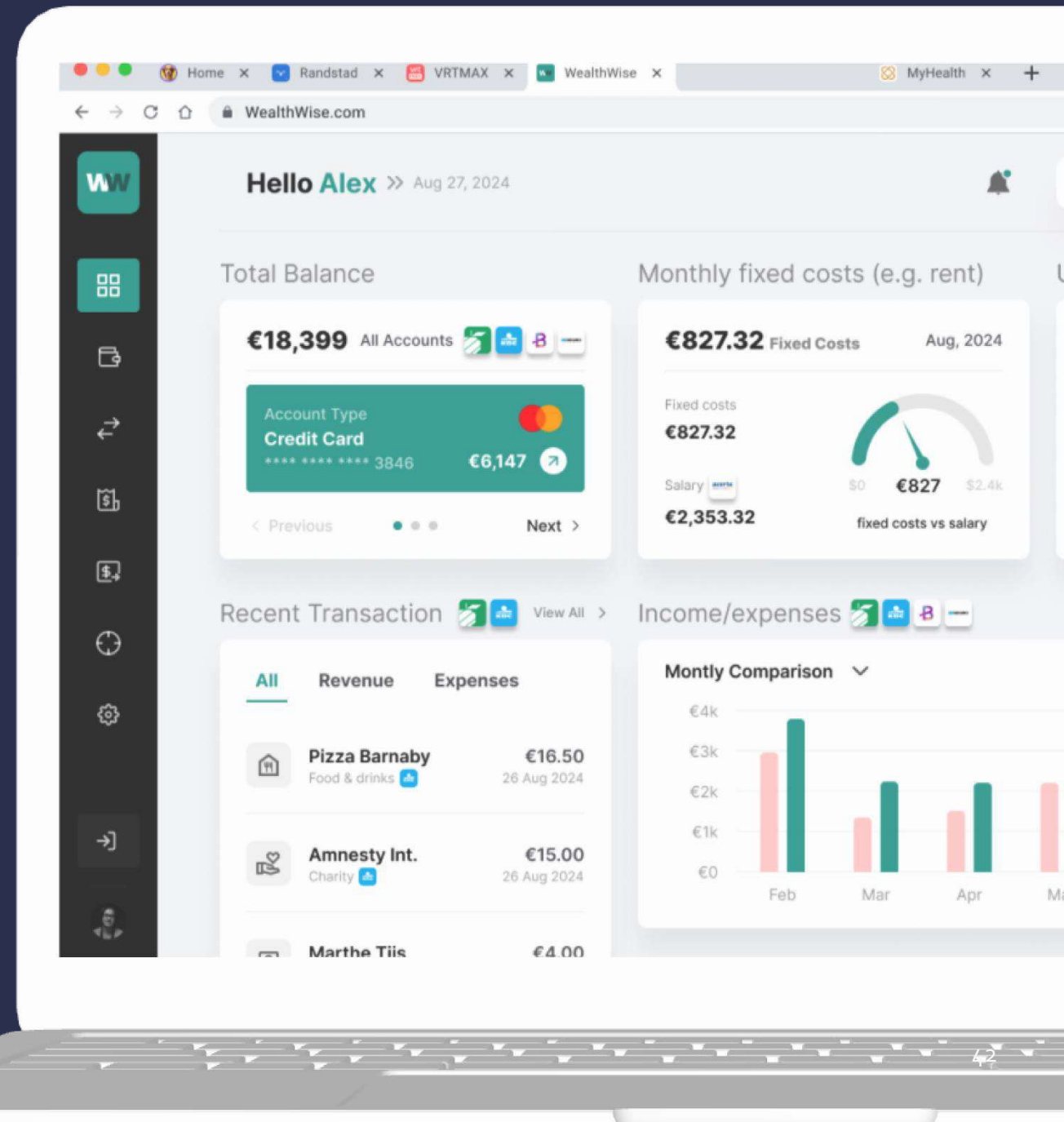


Media

"Sometimes you just want to watch a no-brainer, and then I wouldn't share because I think, wow, people would think I only watch silly series."

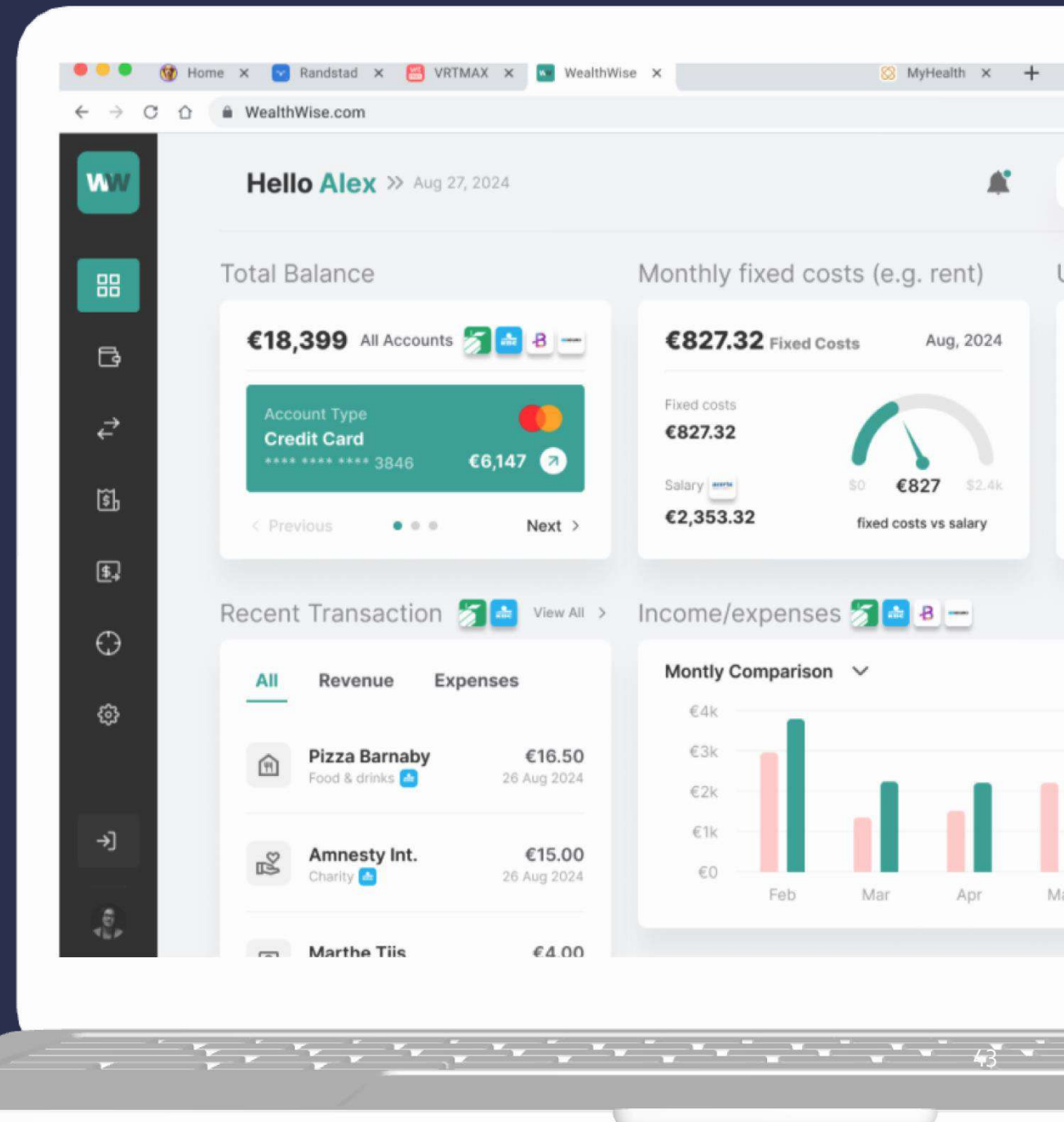
ww Finance

- Initial caution due to platform unfamiliarity
- Participants were looking for a link with their bank
- Clear value in financial overview
- Willingness to share increased after using the tool
- Lower relevance for some users (e.g. students, single bank users)



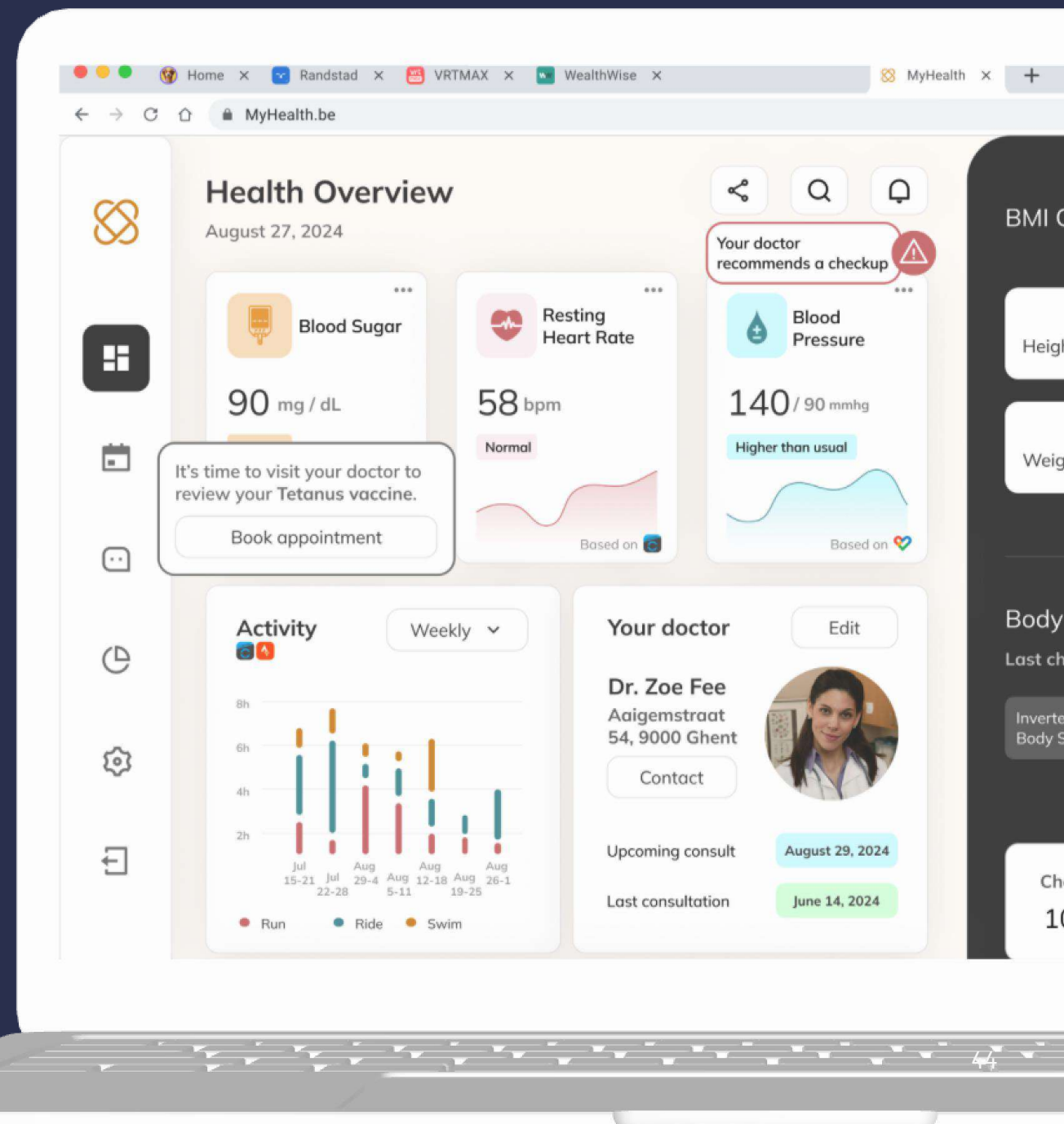
ww Finance

"It must be really secure, because otherwise I would never use it. [...] If this doesn't look secure, then I would rather scroll through the various banking apps than open this."



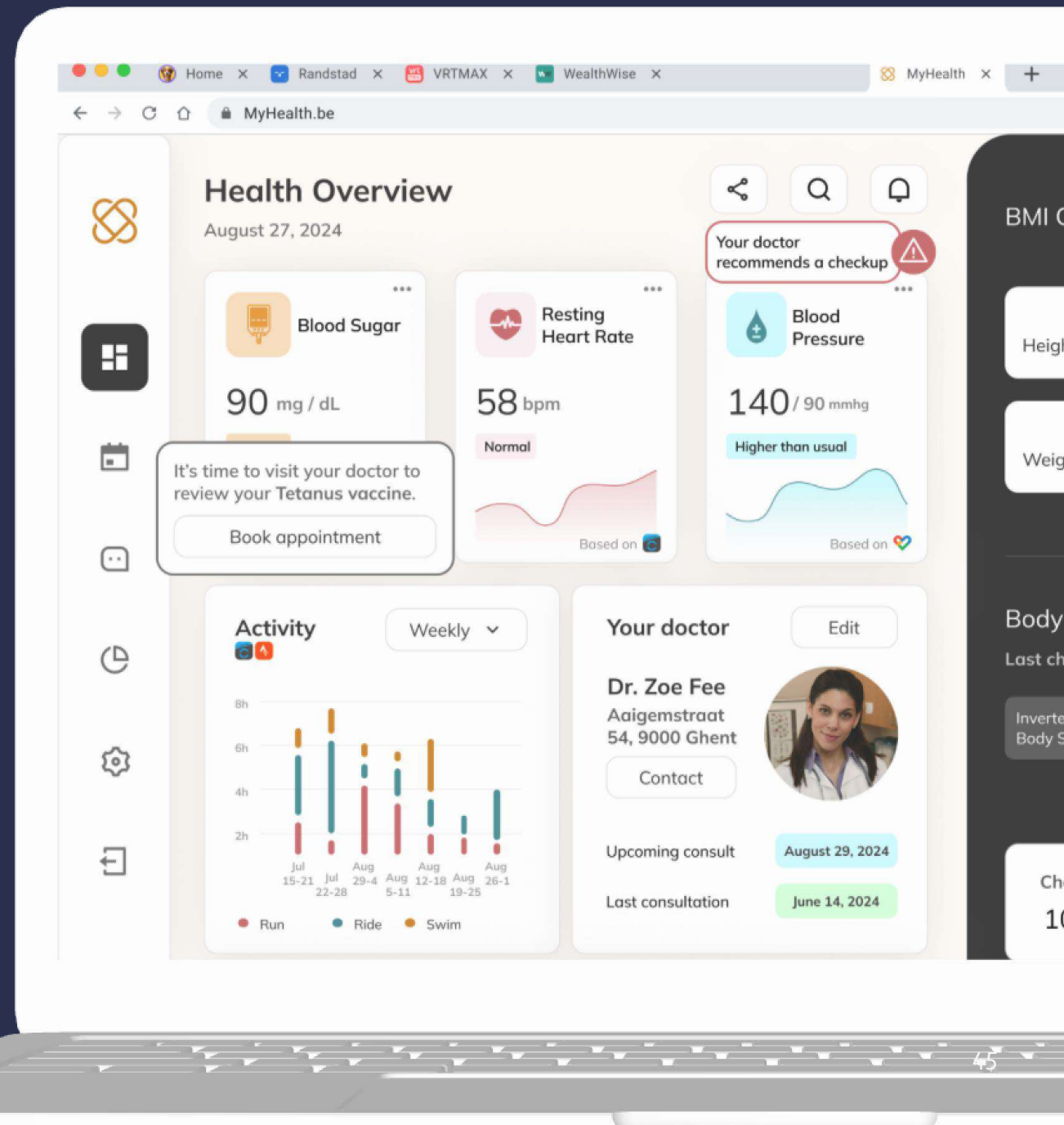
Health

- “With your doctor you should be able to share everything” VS “If I do not have any issues, then he should not know when I’m exercising.”
- **High willingness to share**
- Strong appreciation for **admin simplification**
- **Proactive health alerts** and clear **dashboards** well received
- Concerns **insurance misuse**



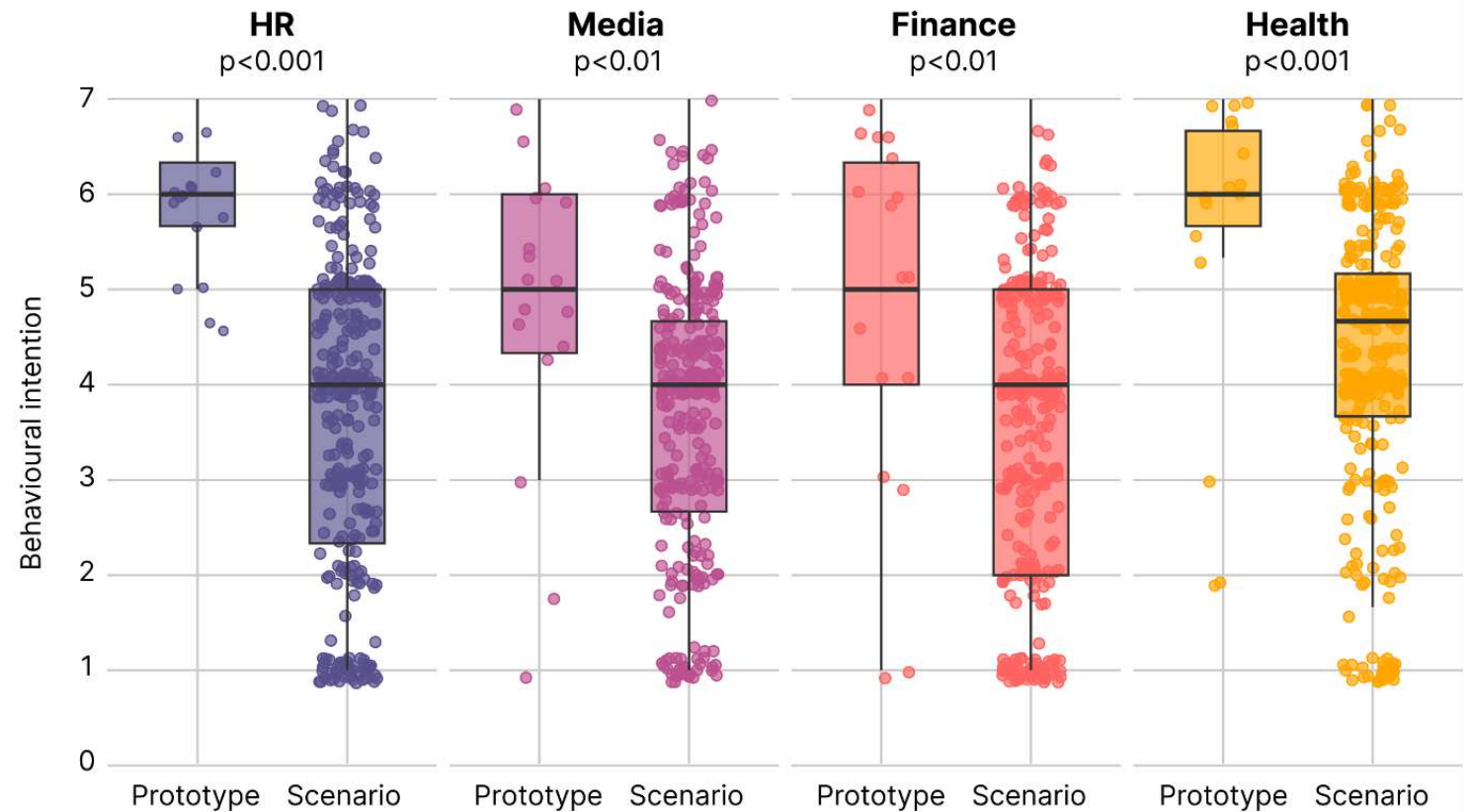
Health

"I had surgery recently, and I had to do things on a thousand platforms and so on. So if those things were all clustered, that would be super practical."

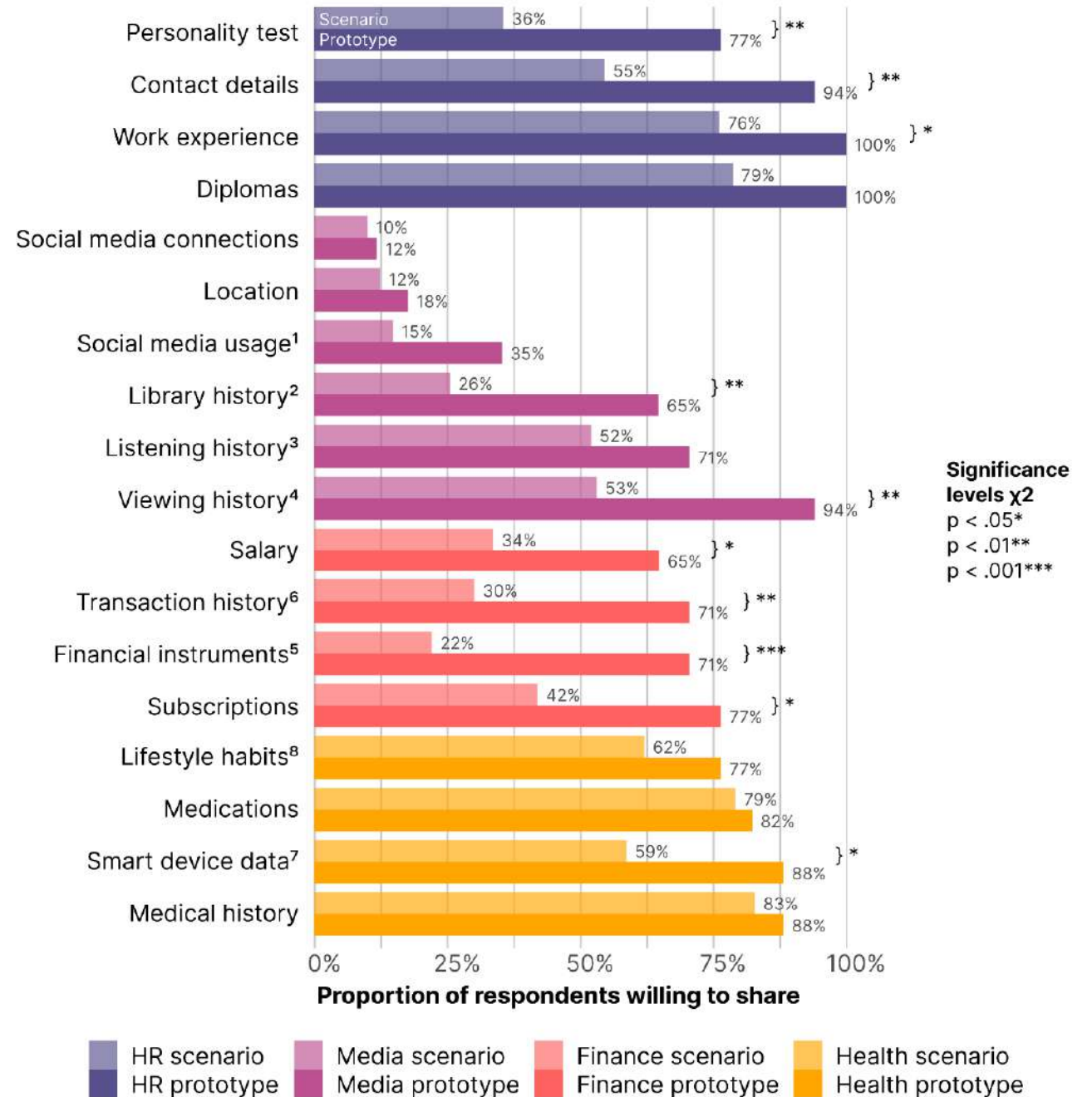


Prototype interaction appears to heighten users' interest

Participants who interacted with the **prototype** report **higher behavioral intention** scores across all use cases compared to those who evaluated the written scenarios.



Participants who interacted with the prototype report a higher willingness to share data



Conclusion

1. “Show don’t tell”

Tangible experiences increase adoption potential

2. Security is the top barrier

Thematic PDSs could reduce perceived risk but reduce PDS efficiency

3. Trust in provider is essential

Government affiliation increases credibility—but not for all data types

4. Users prefer utility over leisure

Stronger enthusiasm for Health and HR use cases

5. Simplicity vs. Control tension

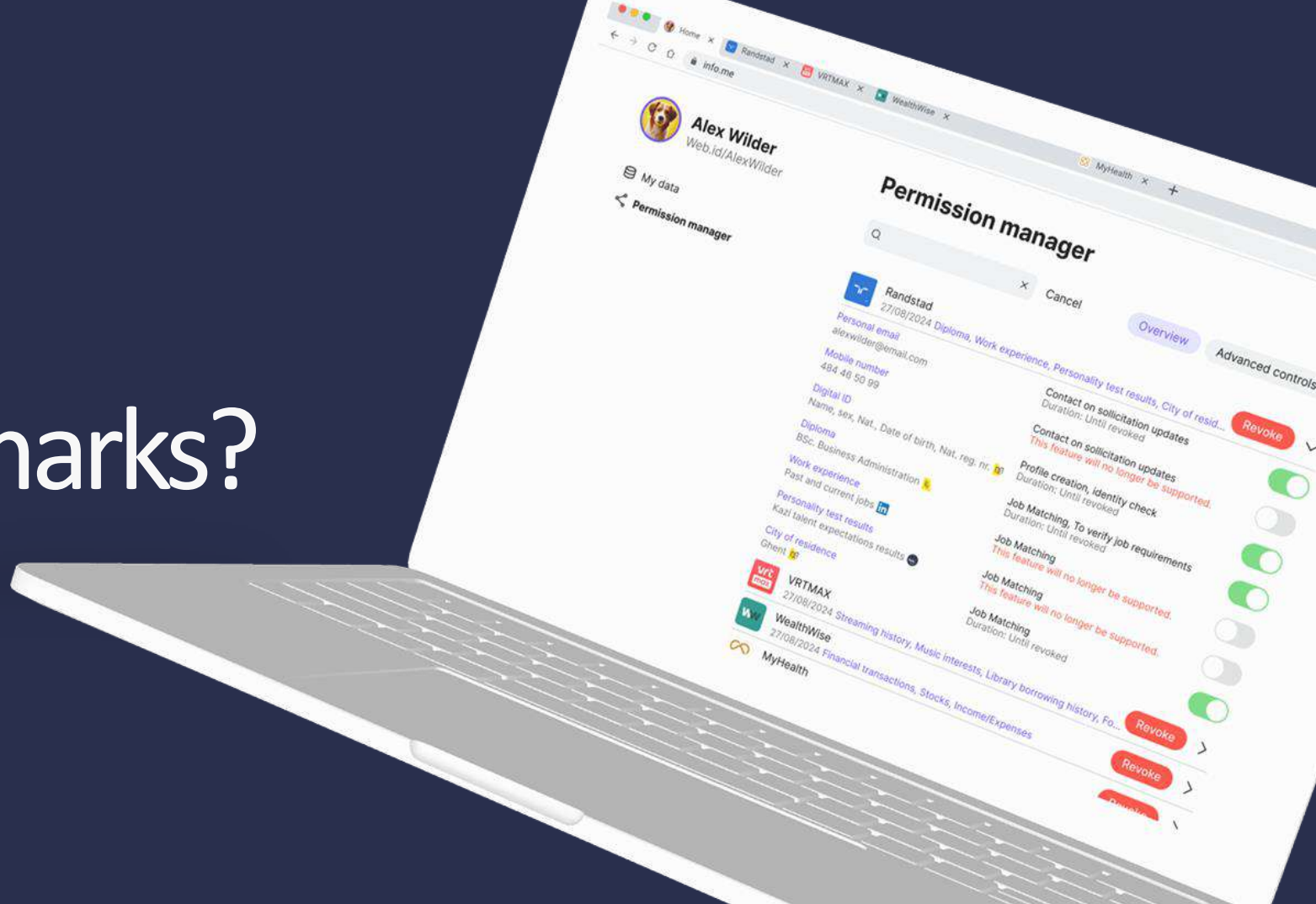
Personalization with transparency and control, data minimization and gradual onboarding

6. Usability ≠ main hurdle

Explainability—not usability—is the real challenge

Questions or remarks?

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Vlaamse
overheid



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