

A Novel Holistic Behavior Change Coaching  
Approach

Harm op den Akker  
Roessingh Research and Development

[www.council-of-coaches.eu](http://www.council-of-coaches.eu)

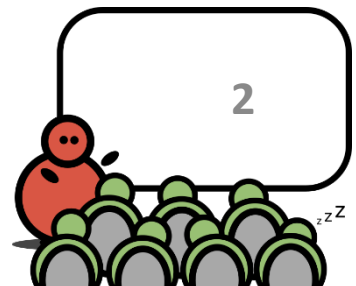
# Content

- The Project
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- The Challenges
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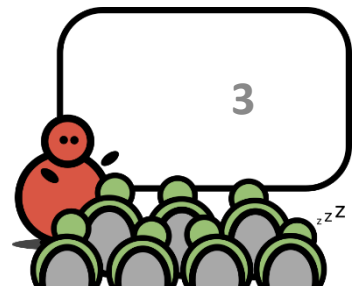
# The Project

A bird's eye view



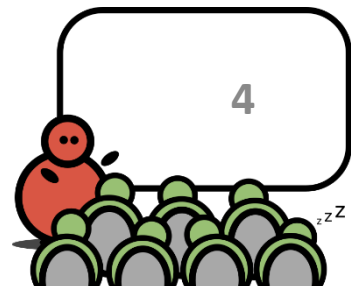
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# The Project

<b>Project name</b>	Council of Coaches (COUCH – Grant Agreement #769553)
<b>Call</b>	H2020-SC1-PM-15: “Personalised coaching for well-being and care of people as they age”
<b>Type of action</b>	RIA (Research and Innovation Action)
<b>Duration</b>	36 Months (September 2017 – August 2020)
<b>Total budget</b>	€ 3,704,000.00
<b>Consortium</b>	University of Twente – Centre for Monitoring and Coaching (NL) Roessingh Research and Development (NL) Danish Board of Technology Foundation (DK) University Pierre and Marie Curie (FR) University of Dundee (UK) Polytechnic University of Valencia (ES) Innovation Sprint (BE)



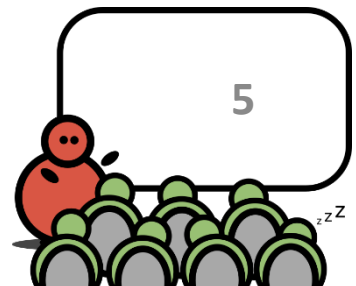
# The Consortium

The partners and their roles



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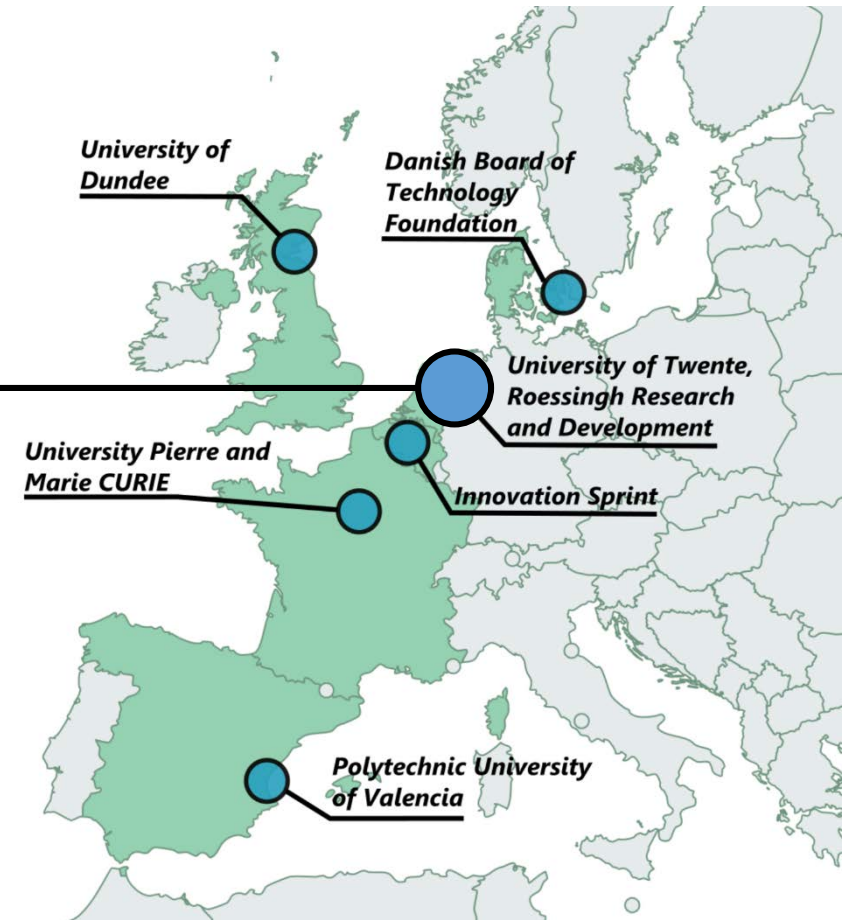
# The Consortium

## UNIVERSITY OF TWENTE.

The University of Twente's Centre for Monitoring and Coaching joins the project with a collaboration between biomedical engineering and human-computer interaction groups.

Key roles:

- Project Management
- Sensing Framework
- Human-Computer Interaction Design



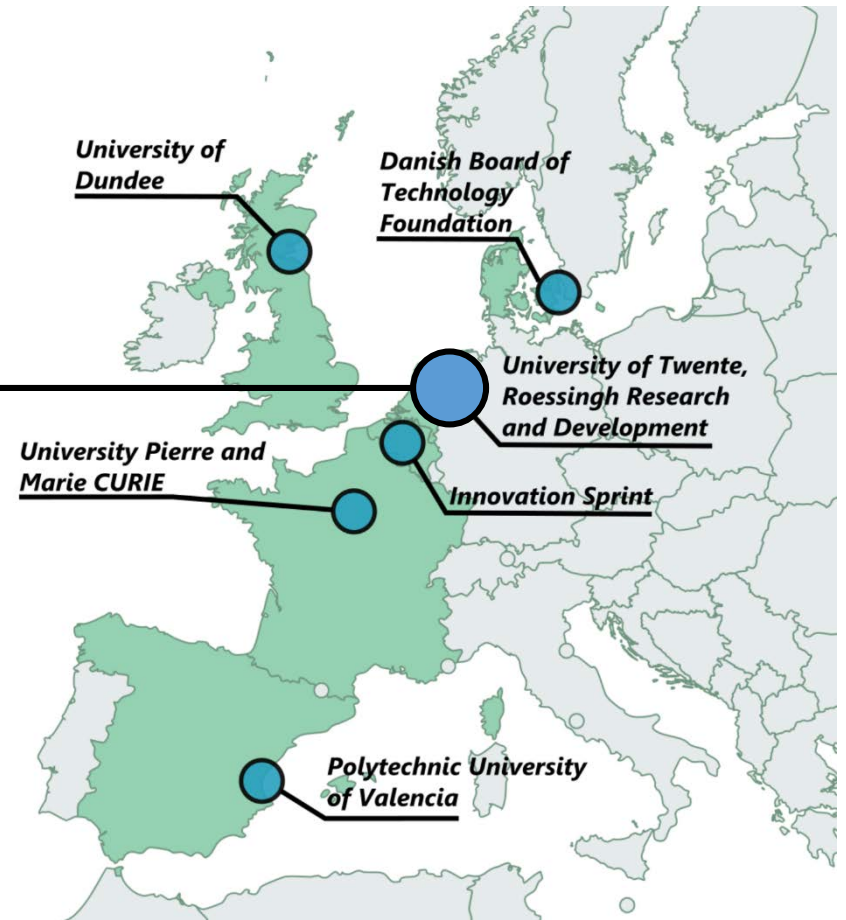
# The Consortium



Roessingh Research and Development provides the connection to end-users as a link between technology and the healthcare world.

Key roles:

- Technical Management
- User Requirements and Evaluation
- Coaching Content and Knowledge Bases



# The Consortium



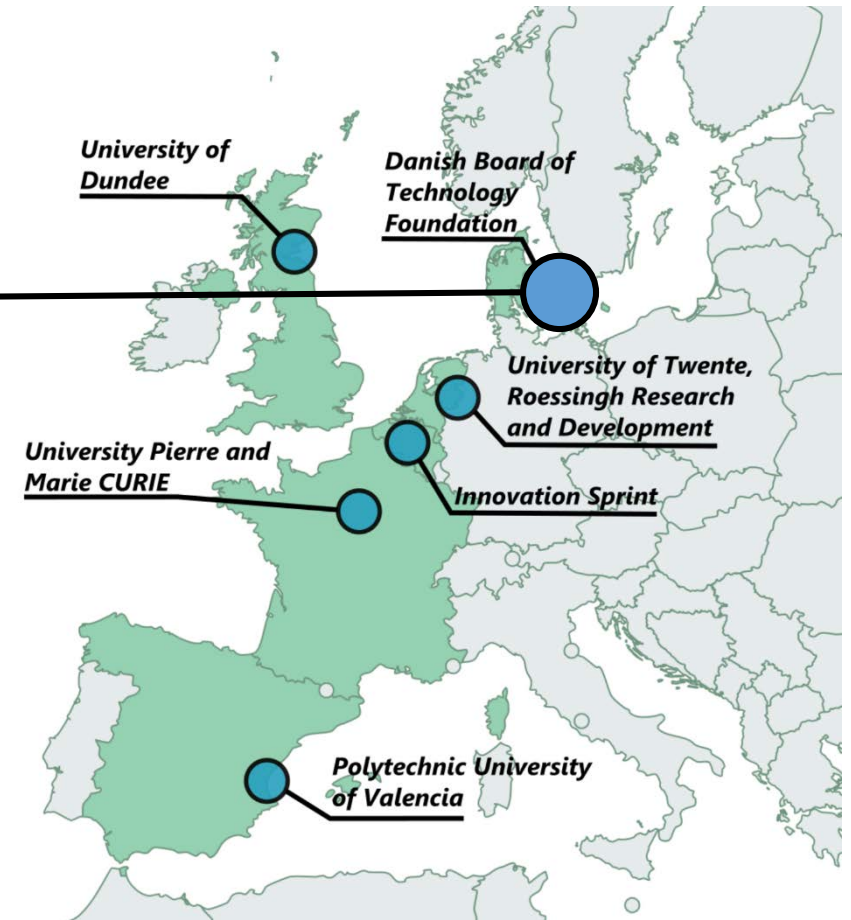
**FONDEN TEKNOLOGI RÅDET**  
DANISH BOARD OF  
TECHNOLOGY FOUNDATION

CREATING  
SOCIETY  
TOGETHER

The Danish Board of Technology Foundation oversees the project's Responsible Research and Innovation practices.

Key roles:

- Responsible Research and Innovation guidance
- Stakeholder analysis
- User Requirements and Verification





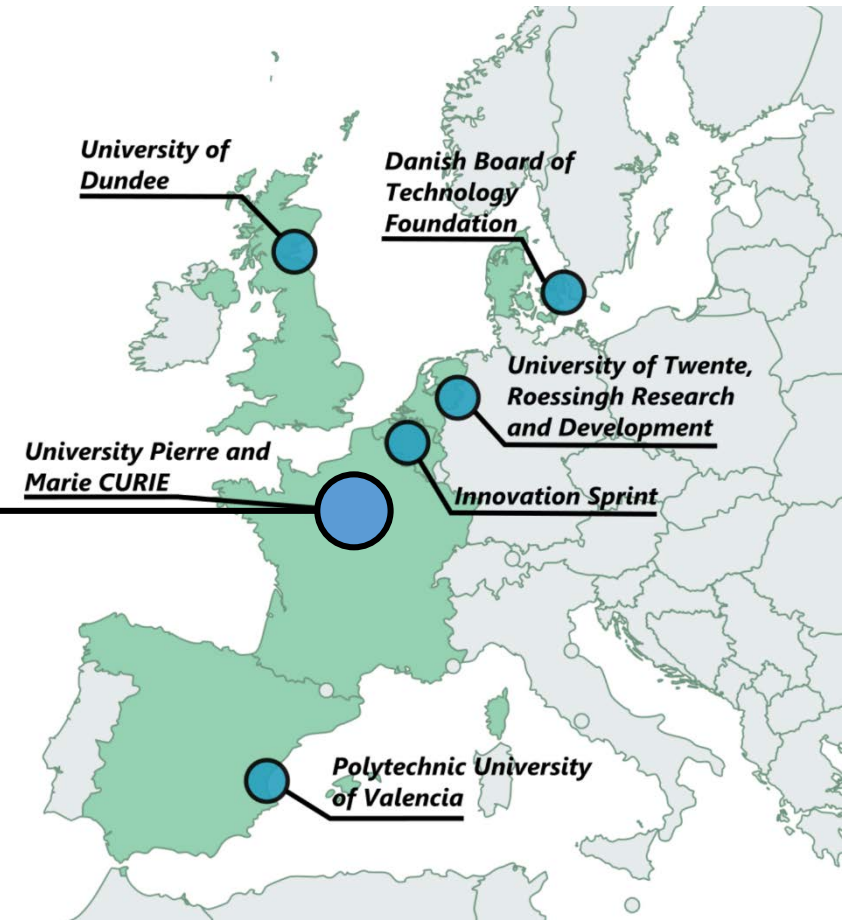
# The Consortium



The University Pierre and Marie Curie (Paris 6) brings their virtual agent platform and human computer interaction expertise.

Key roles:

- Virtual Agent Platform development
- Human-Computer Interaction Design



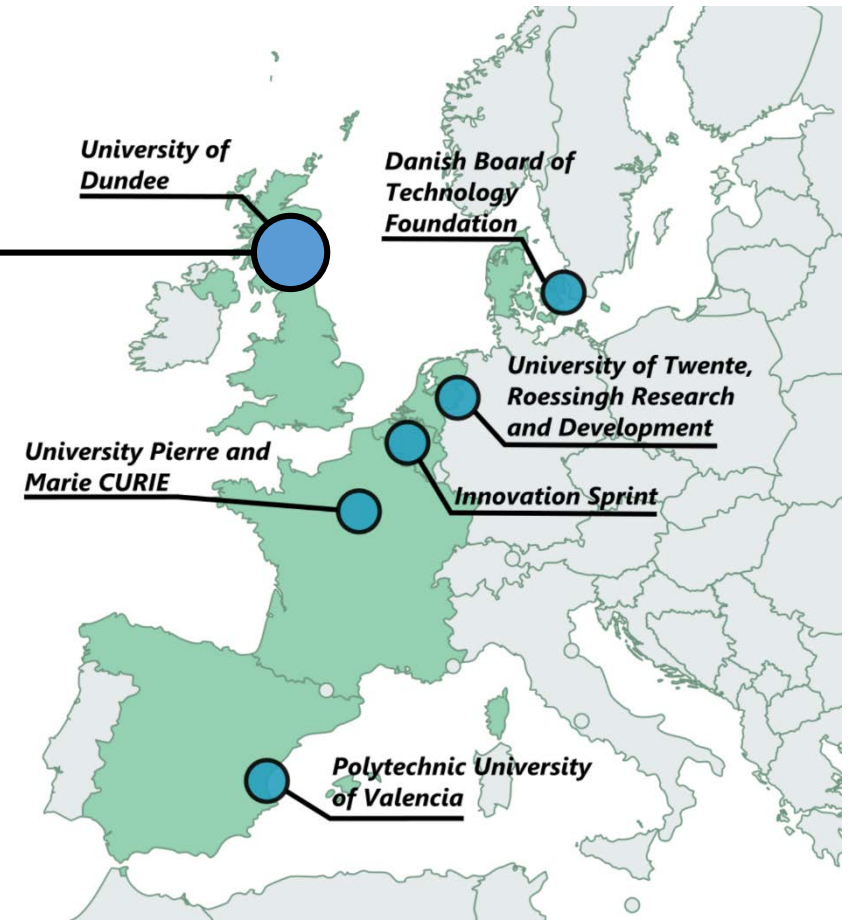
# The Consortium



The University of Dundee brings in the dialogue and argumentation framework to create logical multi-party conversations.

Key roles:

- Dialogue and Argumentation Framework
- Testing and evaluation site
- Connections to Diabetes care



# The Consortium

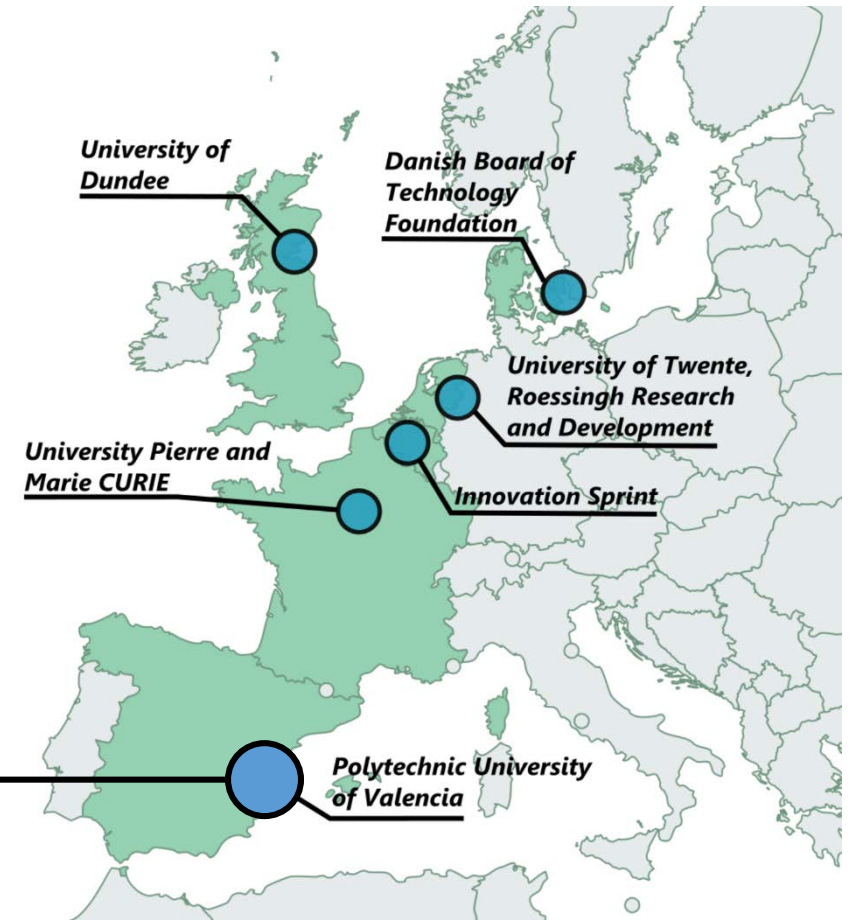


UNIVERSITAT  
POLITÈCNICA  
DE VALÈNCIA

The Polytechnic University of Valencia takes care of the technical integration of the various platform components.

Key roles:

- Technical Platform Integration
- Expertise in key enabling platforms (UniversAAL, FIWARE)



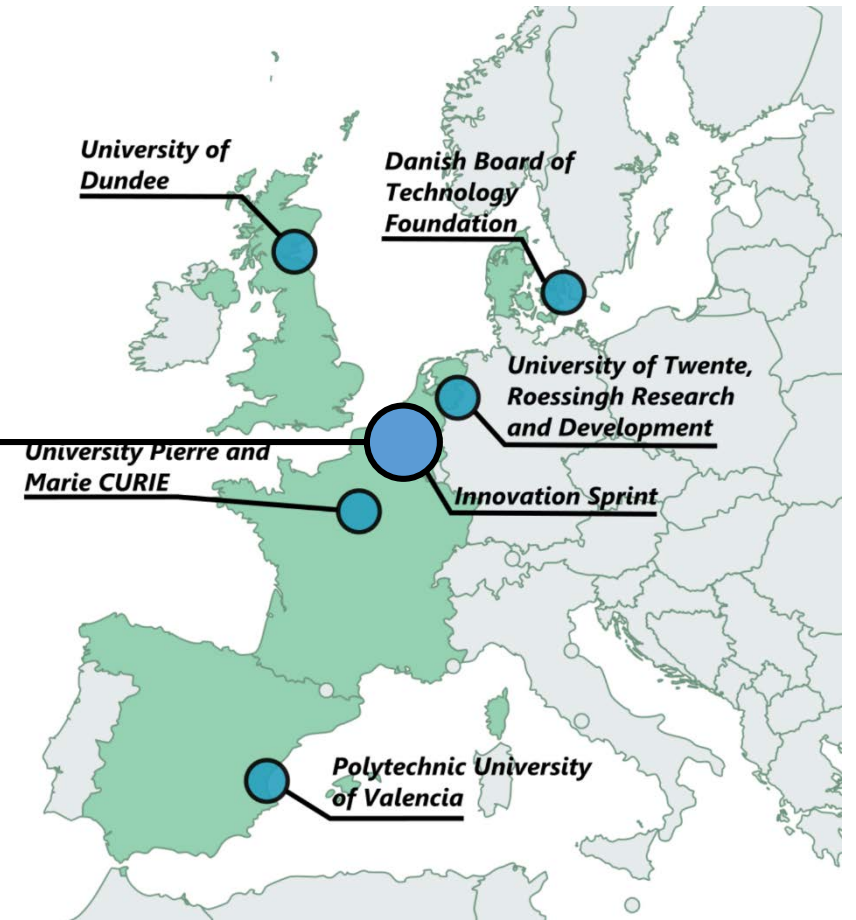
# The Consortium



Innovation sprint manages the project's dissemination and exploitation strategies, enabling successful market adoption.

Key roles:

- Dissemination strategies.
- Lead Exploitation partner.



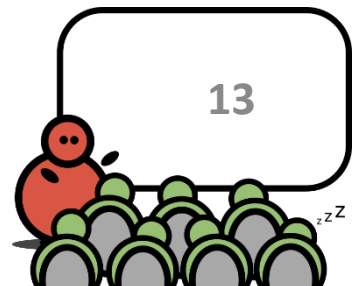
# The Problem

Why are we doing these things?



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# The Problem

- Due to advancements in treatment and care, the average human life expectancy has increased significantly over the past decades. Unfortunately the added years we gain at the end of our lives are **not always lived in good health**.
- Instead, more and more older adults are living under the effects of **various chronic conditions**.
- Such conditions cannot be cured, but it has been shown that a **healthy lifestyle** substantially contributes to their prevention, and reduces their impact on quality of life.
- Adopting a healthy lifestyle means **changing engrained patterns of behaviour** – something that is notoriously difficult to achieve without the right support.
- Tools that provide personalized coaching are rapidly emerging, and in some domains (e.g. physical activity) have penetrated the market.
- Key limitations are that such tools focus on a **single domain**, are targeted at a **young and active audience**, and lack the ability to remain **engaging over longer periods of time**.

# The Problem: engagement

- Virtual coaches exist, but do not always manage to capture the users attention...
  - Coach: *Have you considered trying to quit smoking, Bob?*
  - Bob: *None of your business.*
- So, now what?

# The Problem: intelligence

- Even with a more cooperative user, virtual coaches may simple not be smart enough...
- Coach: *Have you considered trying to quit smoking, Bob?*
- Bob: *Well... eh, I guess the moment I walked out of my doctor's door, I was ... well it was quite a shock I tell you. I heard about COPD before but it's the type of thing you hear about other people you know? I put my hands in my pocket and felt the cigarette box, but then ... yes I thought to myself, better not this time. Since then I have been smoking again on and off...*
- Coach: *I did not understand your response.*



# The Problem: multi-dimensionality

- Lifestyle change is often a multi-domain problem!
- E.g. diabetes: medication, diet, physical activity, emotional
- E.g. chronic pain: medication, coping, physical activity, physiotherapy
- E.g. retirement: social isolation, emotional, purpose, etc...

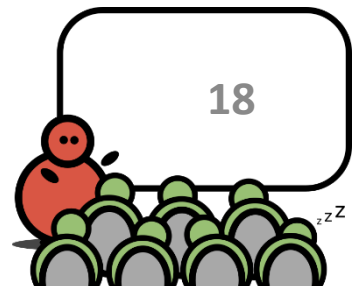
# The Solution

This should come as no surprise at this point...

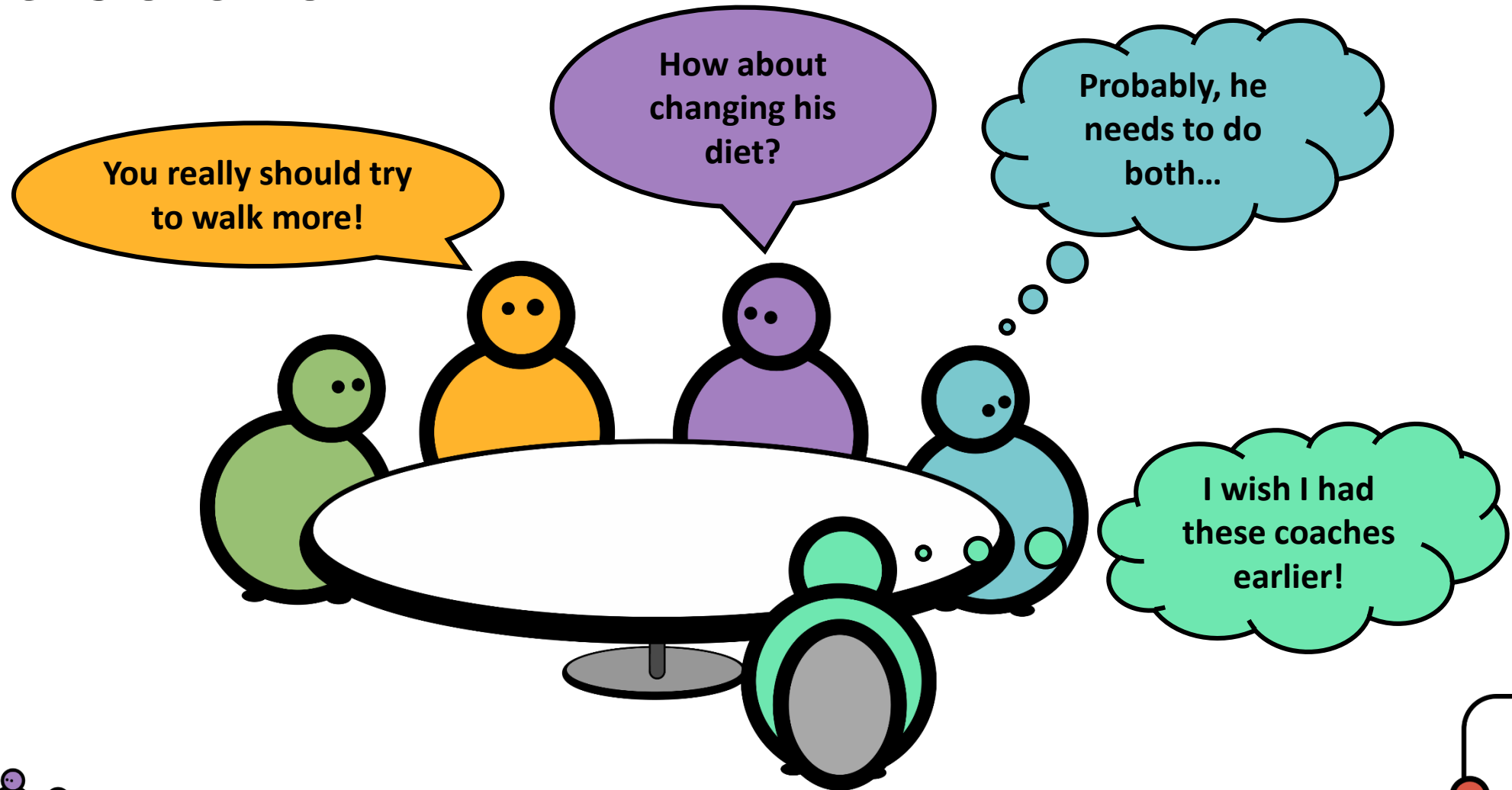


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# The Solution



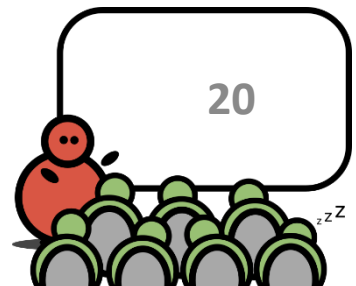
# The Objectives

A closer look at the project's key objectives



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# Objectives: Multi-Domain Virtual Coaching

- Design, develop and evaluate a Virtual Coaching System targeted at older adults that are undergoing life changing events that have a potential negative impact on **physical**, **cognitive**, **mental**, and/or **social** well-being.
- Specific use cases that will be addressed:
  - **Diabetes**
  - **Chronic Pain**

# Objectives: A New Coaching Platform

- Introduce the **new coaching paradigm** of the Council of Coaches. In this paradigm, the virtual coach is manifested in a group of virtual characters that each represents a different knowledge domain of the coach.
- This new coaching paradigm will be demonstrated, and eventually results in the release of an **Open Agent Platform** (building on top of existing open platforms, such as FIWARE and universAAL), that will foster **Open Innovation** through the creation of an engaged community and developer eco-system.

# Objectives: Sensing++

- In order to tailor communication, the virtual coaches must understand its user. To sense the required “*psychological user information*”, the project introduces the concept of the **coach-as-a-sensor** – allowing to obtain knowledge about the use through interactive dialogues.
- The project will combine smart multimodal sensing technologies to seamlessly and opportunistically measure and model the user behaviour in a comprehensive fashion, including physical, cognitive, mental and social aspects.

# Objectives: Character Design

- The project will emphasize **deep character design** based on sound theories from the video game and film worlds. The added value in terms of engagement will be measured and existing methods and guidelines will be adopted to the successful design of **virtual characters in coaching contexts** that have an impact beyond mere entertainment.



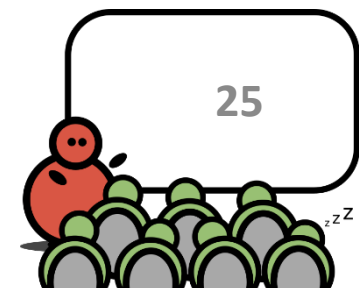
# The Challenges

Why do we need research for this?

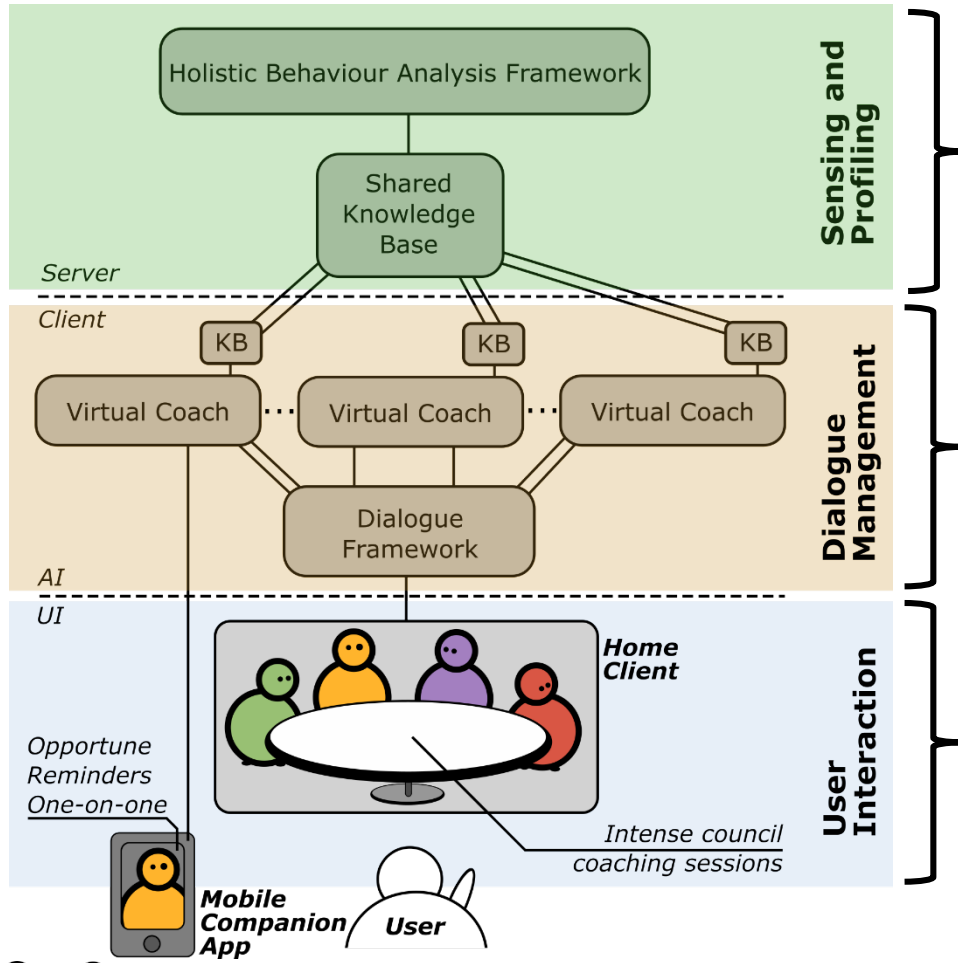


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# The Challenges: technical



Understanding the user's behavior and issues.  
Following the user's progress over time.  
Building up a Shared Knowledge Base.

Enabling automated multi-party dialogue.  
Allowing dynamic turn-taking and interruptions.  
Storing and learning from dialogue history.

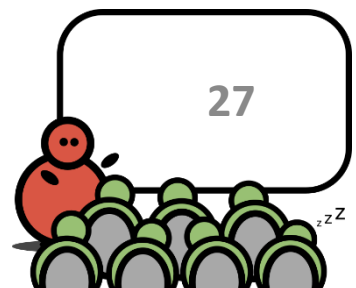
Designing engaging and likeable virtual characters.  
Providing intuitive human-computer interaction.  
Developing a companion app for daily life.

# And finally...

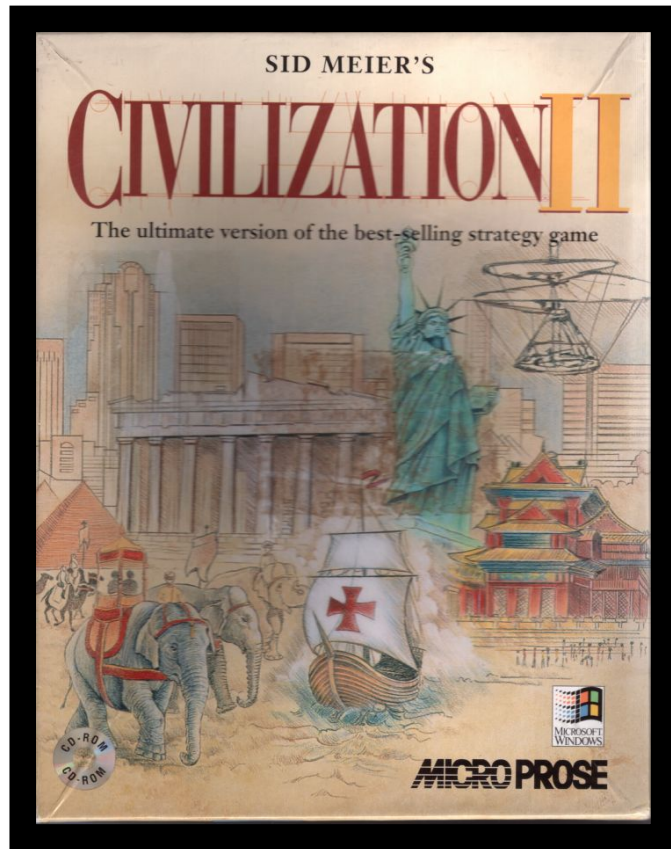


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# The credits...





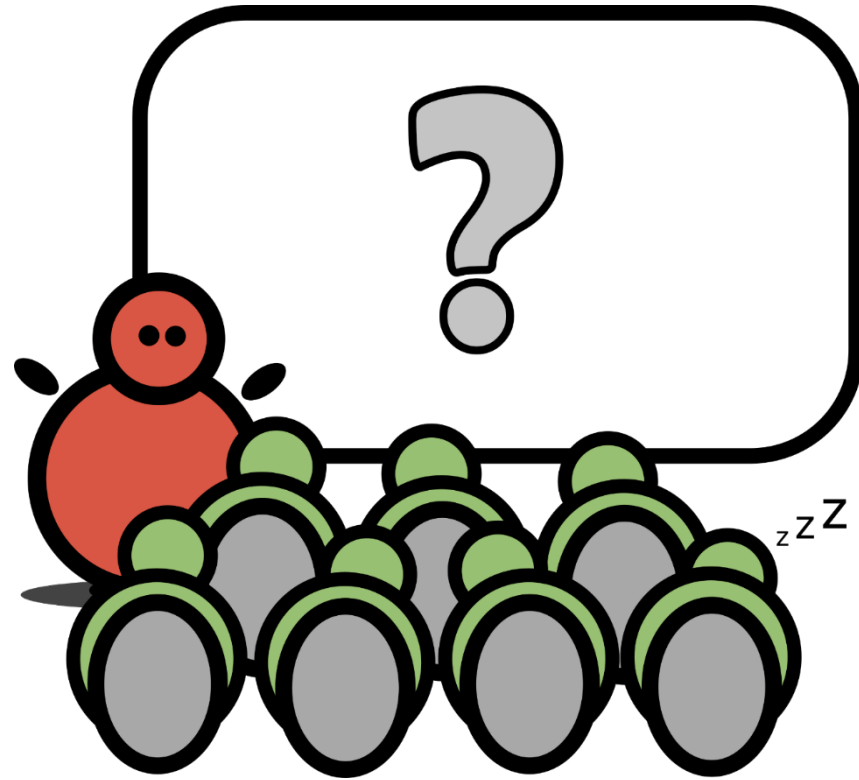
# The Demo

Council of Coaches  
Demo  
v0.00000001

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