PRECIOUS Overview

PREventive Care Infrastructure based On Ubiquitous Sensing

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 611366

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BUILDING MOTIVATION FOR PREVENTIVE CARE!

"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"

PRECIOUS Background

- PRECIOUS aims to **enhance preventive care** with advanced, transparent sensing and developed feedback structures. Specifically:
  - Understand how **user motivation** is built up and maintained in preventive care
  - Study how **intelligent model** of **user's behavior** can be seamlessly built into the PRECIOUS preventive care system
  - Investigate **sensing** and **middleware techniques** for transparent and ubiquitous sensing and inter-application communications to support PRECIOUS usage scenarios

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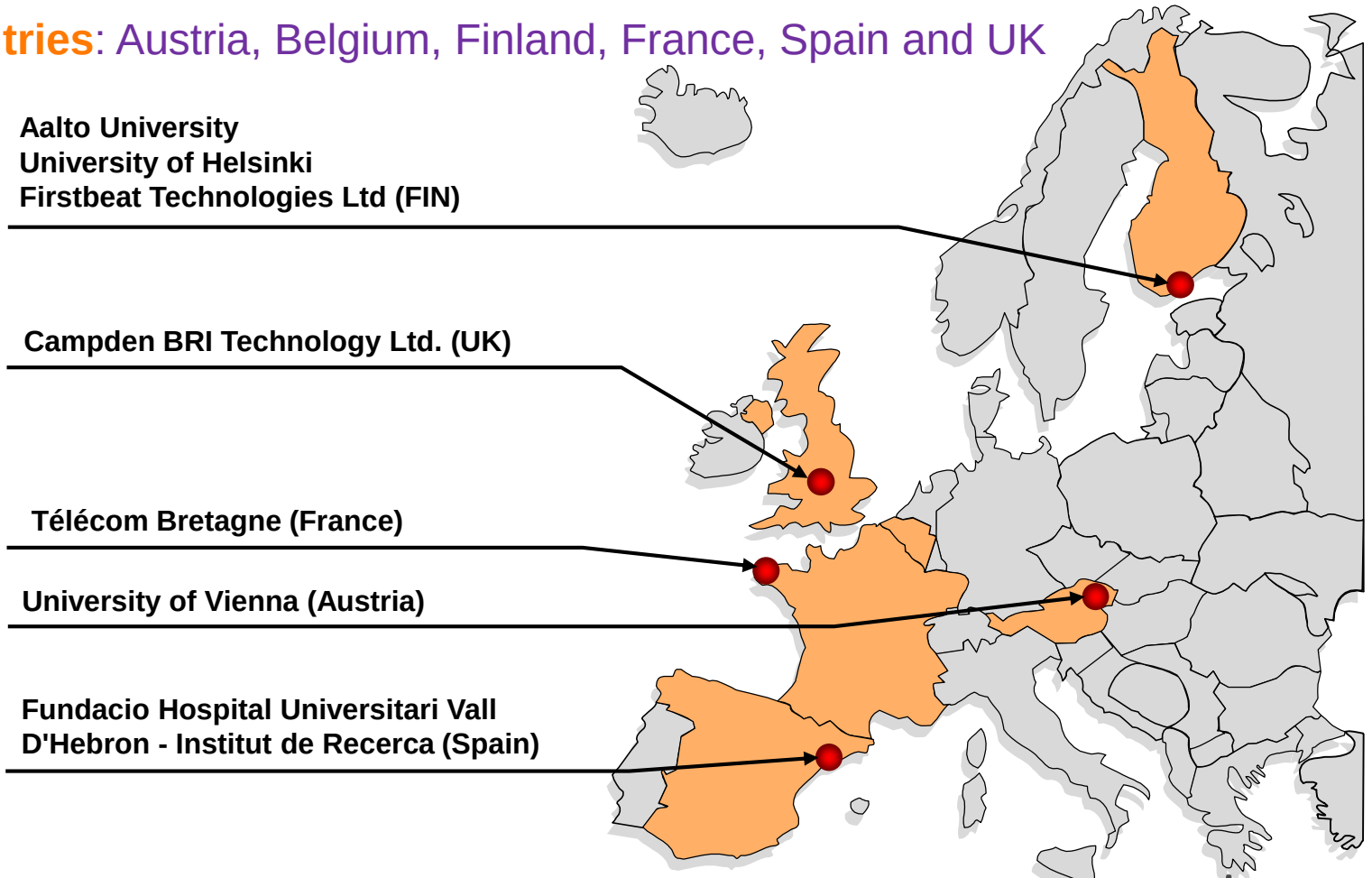
PRECIOUS Consortium

- **Eight participants**: 4 universities, one SME, one industrial research organisation, one university hospital and one non-profit organization
- **Six countries**: Austria, Belgium, Finland, France, Spain and UK



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PRECIOUS Objectives

- **Objective 1**: Motivational system to reduce unhealthy habits in users
- **Objective 2**: Ubiquitous and transparent multimodal sensing platform with personalized user interfaces and actuators
- **Objective 3**: Preventive care services and applications following the virtual individual model
- **Objective 4**: End-to-end system validation in field tests
- **Objective 5:** Research relating socio-economic modeling

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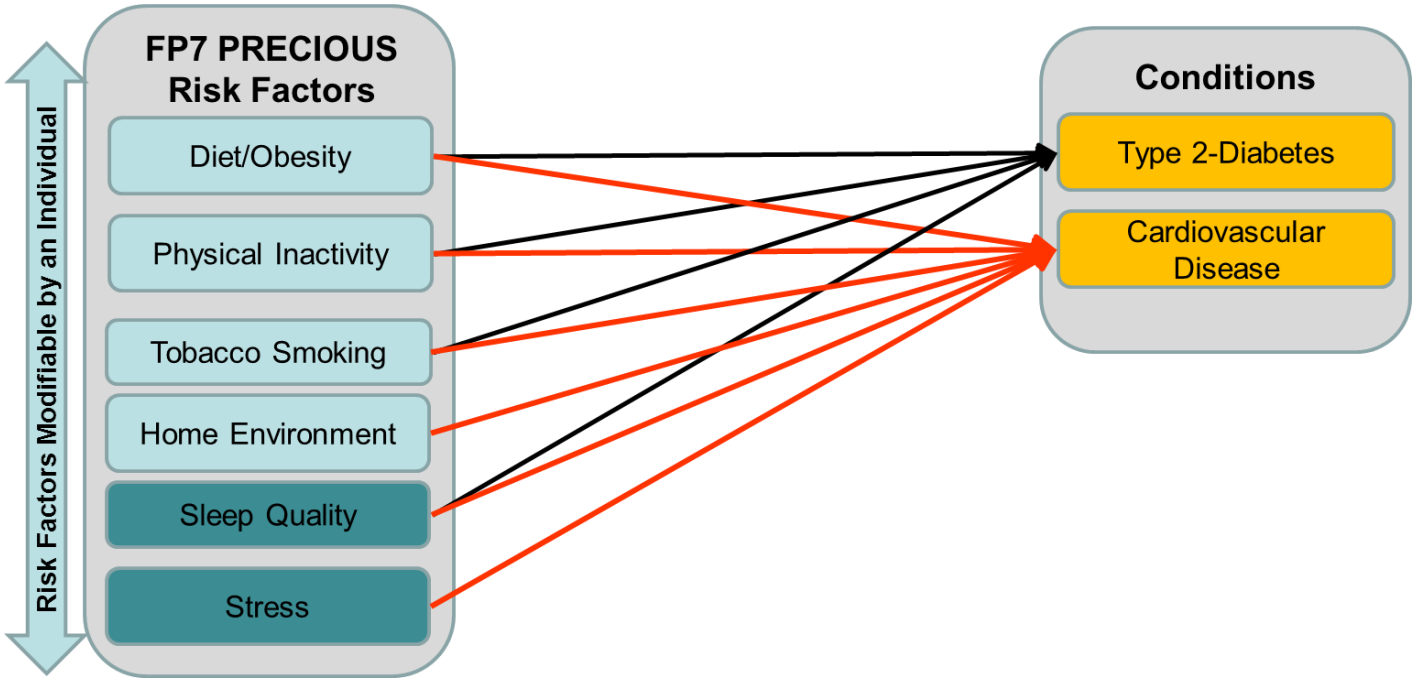
PRECIOUS Approach

- Focus on **risk factors** associated with 2 of the leading eight **non-communicable diseases** (NCDs)*:
  - Type-2 diabetes
  - Cardio-vascular disease



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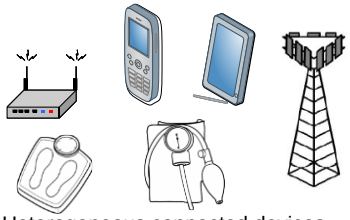
PRECIOUS Approach

RISK FACTOR DATA COLLECTION

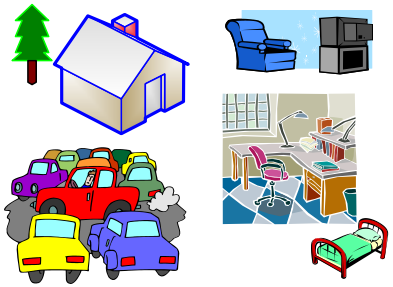
Context elicitation

Sensing and monitoring

Data transfer



Heterogeneous connected devices



Diverse environments and activities

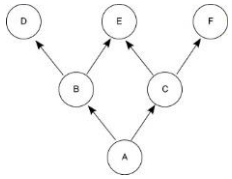
DATA PROCESSING

Data harmonisation

Data warehousing

Data fusion

Data mining



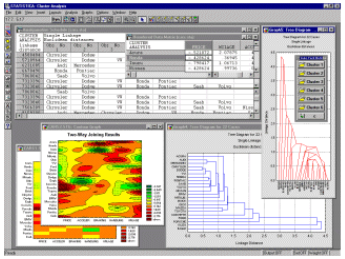
Health records, activity records etc.

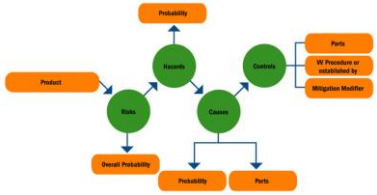
ANALYSIS AND MODELLING

Virtual individual modelling

Lifestyle trend analysis

Risk analysis





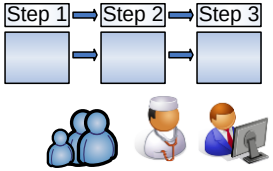
FEEDBACK AND RESPONSE

Feedback and actuation

Stakeholder interventions

Behavourial changes

Personalized feedback



Stakeholders (health, insurance, family etc.)

Individual decisions and choices

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PRECIOUS Outcome…science

- Virtual Individual Model (VIM):
  - Collects data to tailor the service
  - Combines multiple data sources
  - Sensors
    - Physical activity, sleep, stress, location, environment
  - Motivational variables
    - Values, desires, intentions, preferred activities
  - Behavioral change variables
    - Action plans, behavioral goals, links between outcome and behavioral goals, active ‘challenges’
  - User engagement
    - Frequency of use, time of day most likely to use

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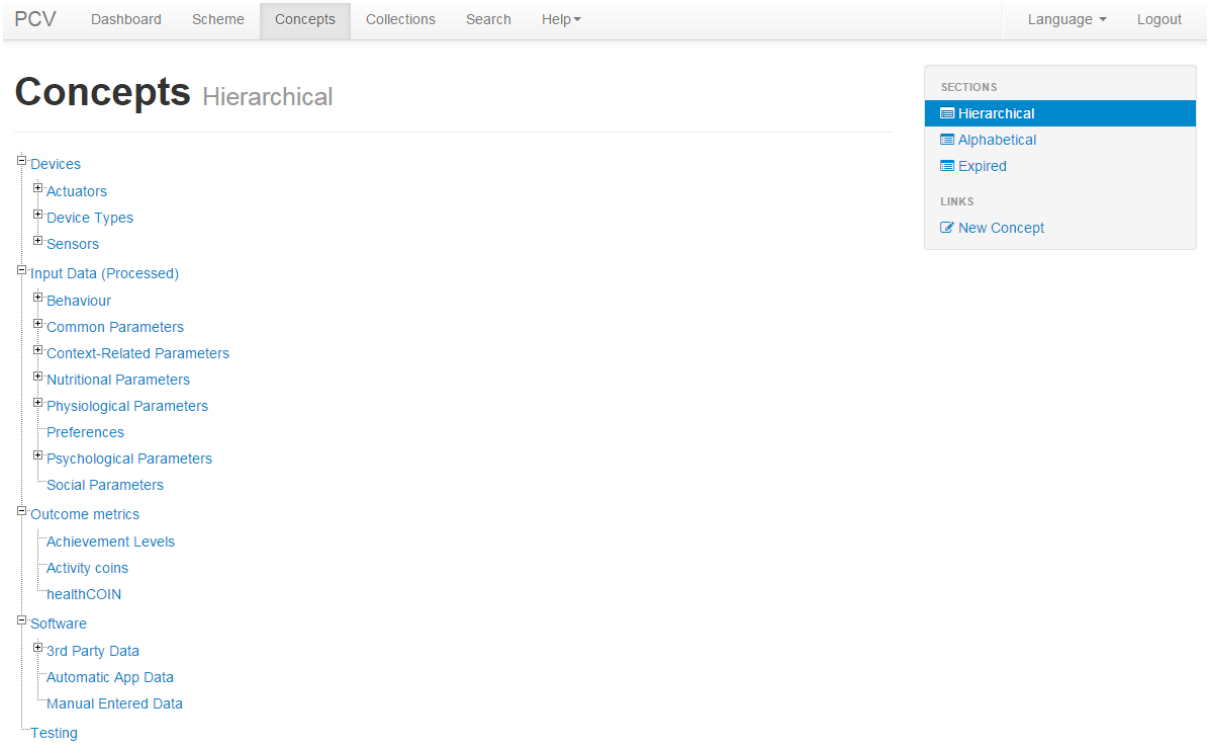
PRECIOUS Outcome…science

- Specification for clear **semantic** dissemination of all PRECIOUS measured and calculated values
- Semantic Vocabulary Creation Cycle (CSVCC) used for collecting parameter definitions



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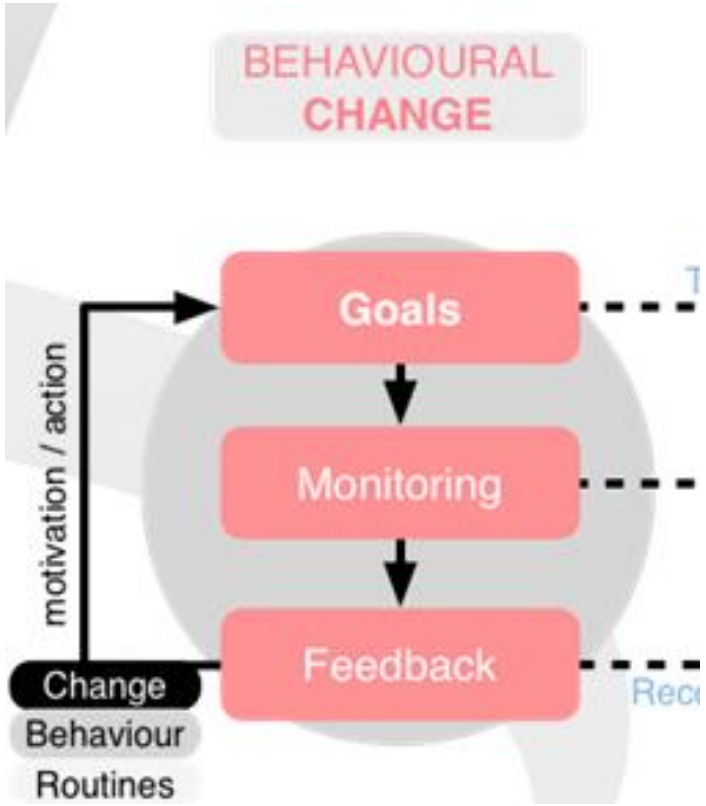
PRECIOUS Outcome…science

Three behavioural change techniques

App

- 6000 steps
- 7111 steps
- Bling! You have reached your goal



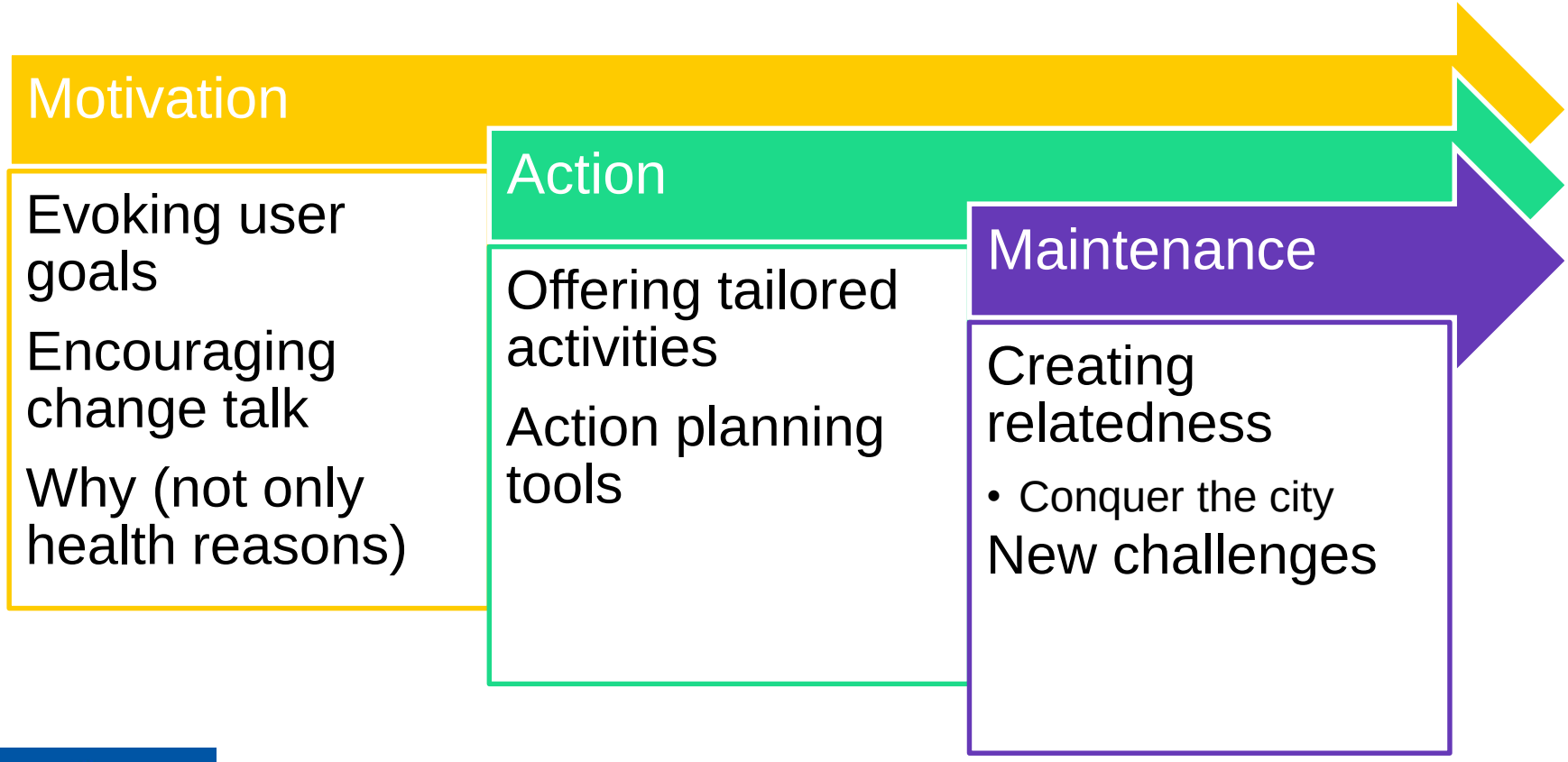
Behavioral goal setting

Monitoring behavior

Feedback on performance

PRECIOUS Outcome…science

What new PRECIOUS include



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PRECIOUS Outcome…science

Building motivation for behavioral change

- How do we translate VIM into personally motivating service?
  - Objective & subjective data used for tailored suggestions.
  - Personal outcome goals and intrinsically motivated activities.
  - Continuous gameplay from the very first initialisation screen to increase engagement with the service

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PRECIOUS Outcome…science

Motivational interviewing

- value clarification / outcome goals
- change talk- based suggestions
- information about health consequences
- discrepancy between current behaviour and goal
- supporting freedom of choice

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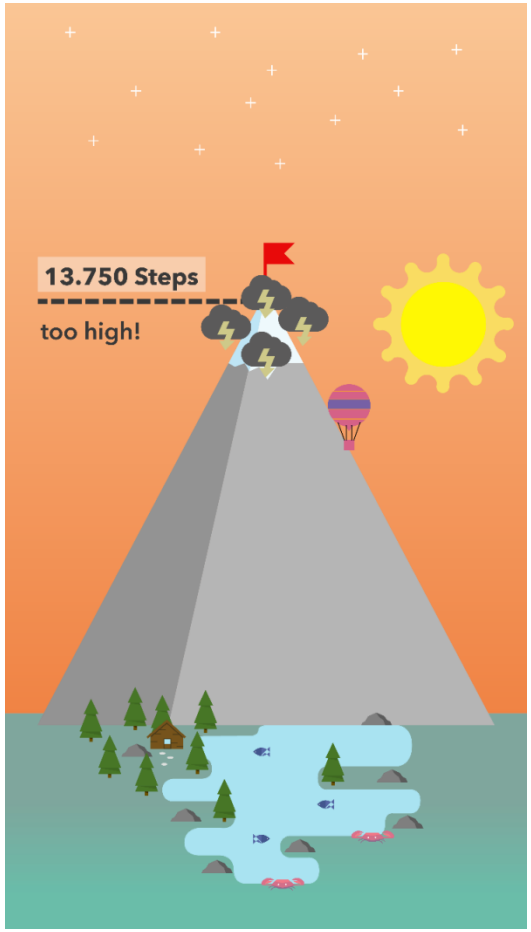
PRECIOUS Outcome…science

Action components



Mountain climber

- Behavioural goal setting
- Self-monitoring of behavior
- Action planning

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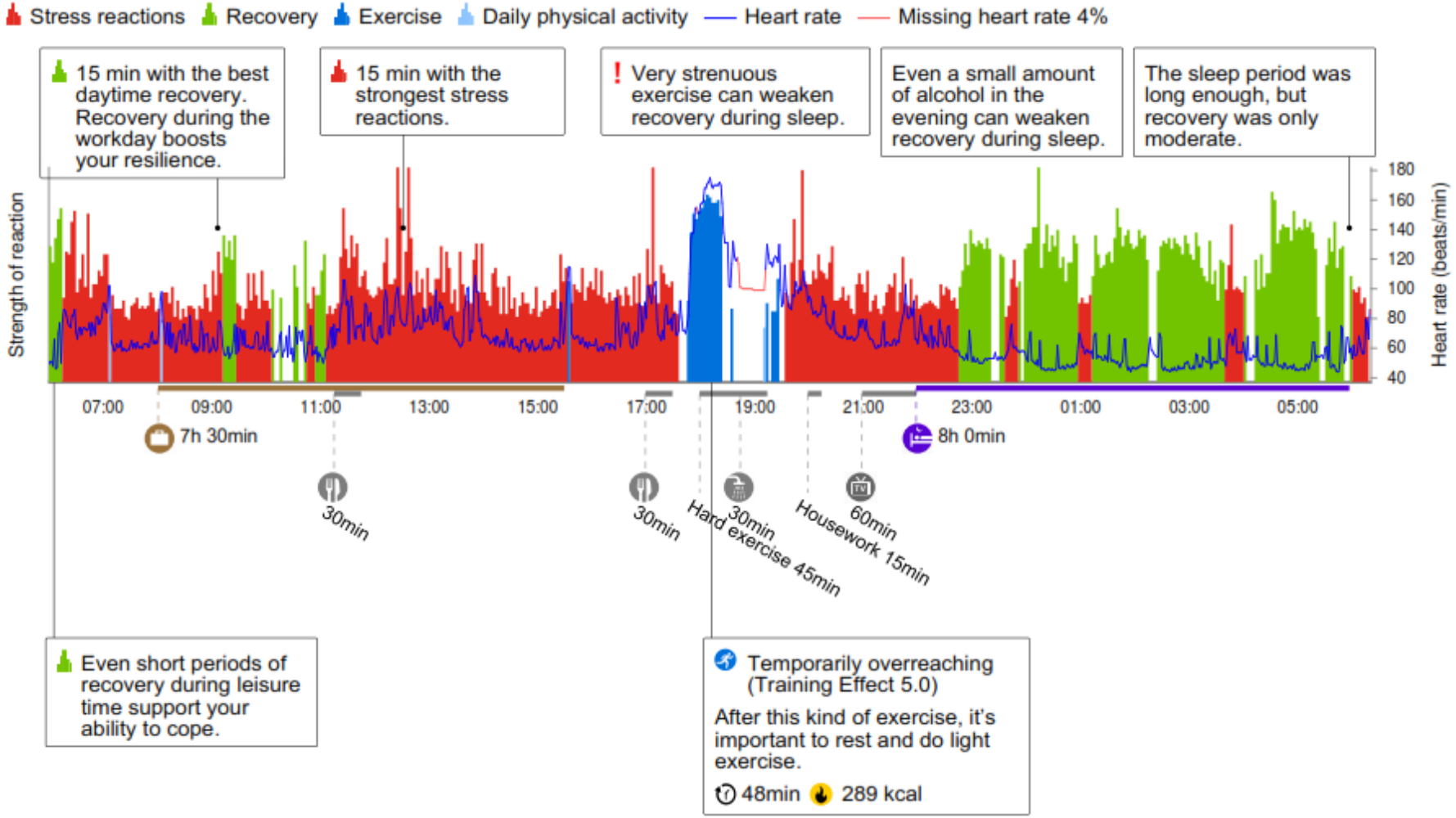
PRECIOUS Outcome…science

User feedback



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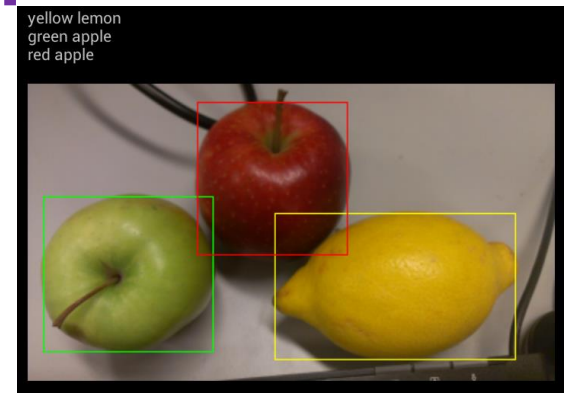
PRECIOUS Outcome…science

Promote healthy habits: Food diary and Food intake recognition

- By taking a photo of the food
  - More information in next slide
- By scanning a barcode
  - Barcode Scanner app offers open source solution
  - Extract nutritional information from product's barcode
- Manual input
  - Filter food based on time (breakfast, lunch, dinner)
  - Write food name (autocomplete)
  - Filter food by tapping (i.e. meat –> chicken –> nuggets)
- Using the wristband
  - In progress



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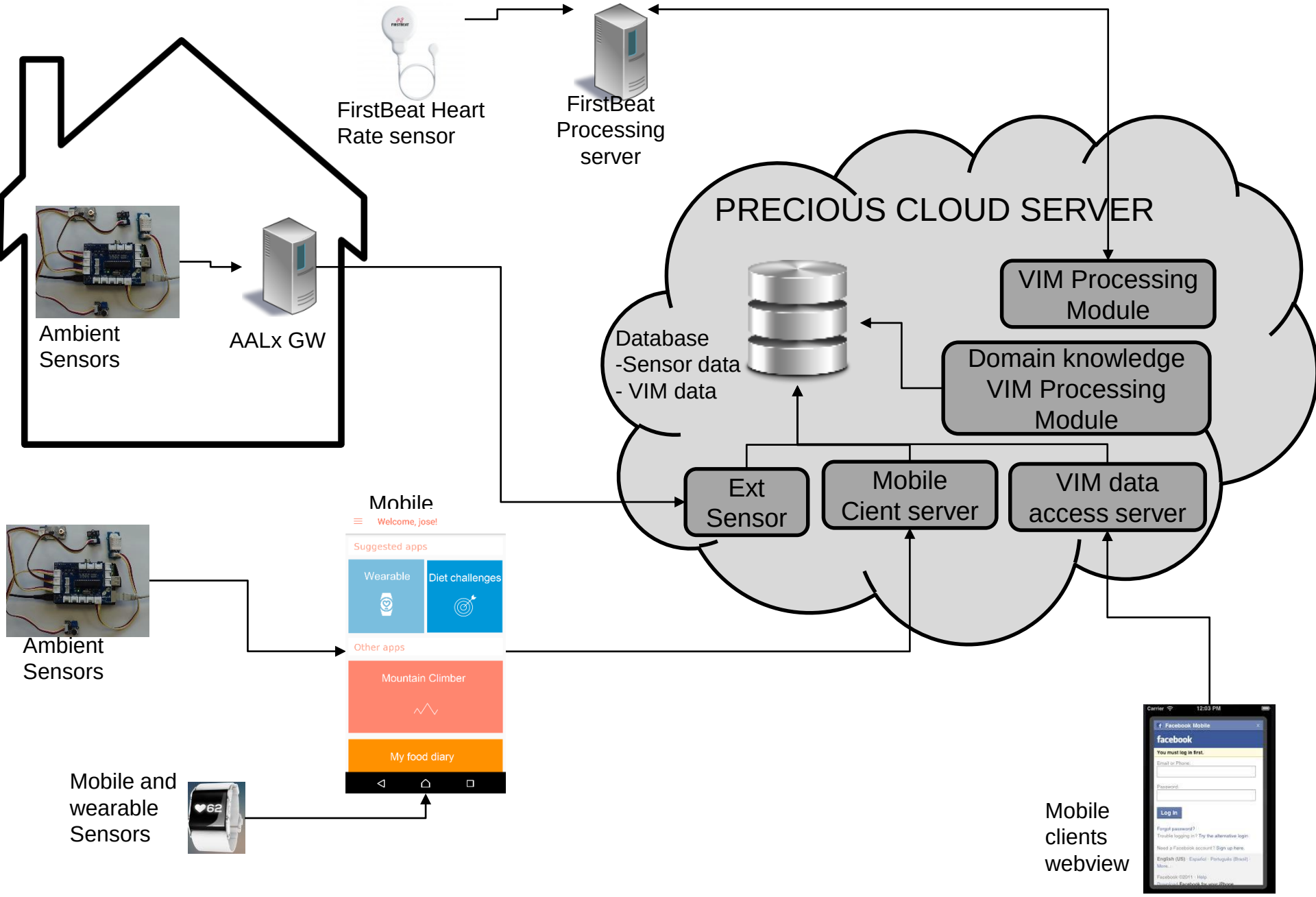
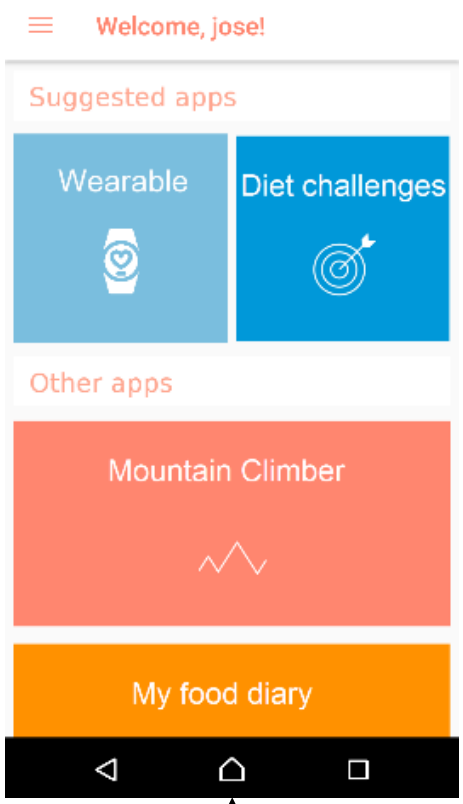
PRECIOUS Outcome…technology



PRECIOUS Outcome…technology



Mobile and wearable Sensors

PRECIOUS Objectives-Achieved

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THANKS!

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