PRECIOUS: Dissemination, Exploitation, and Future Research

PRECIOUS Showcase Seminar,

London, Friday 23rd September 2016

Outline

- Part 1: Dissemination & Exploitation
  - Scientific track
  - Industrial track
  - Startup track
- Part 2: Future Research
  - Some key takeaways
  - Future research directions

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Part 1: Dissemination & Exploitation

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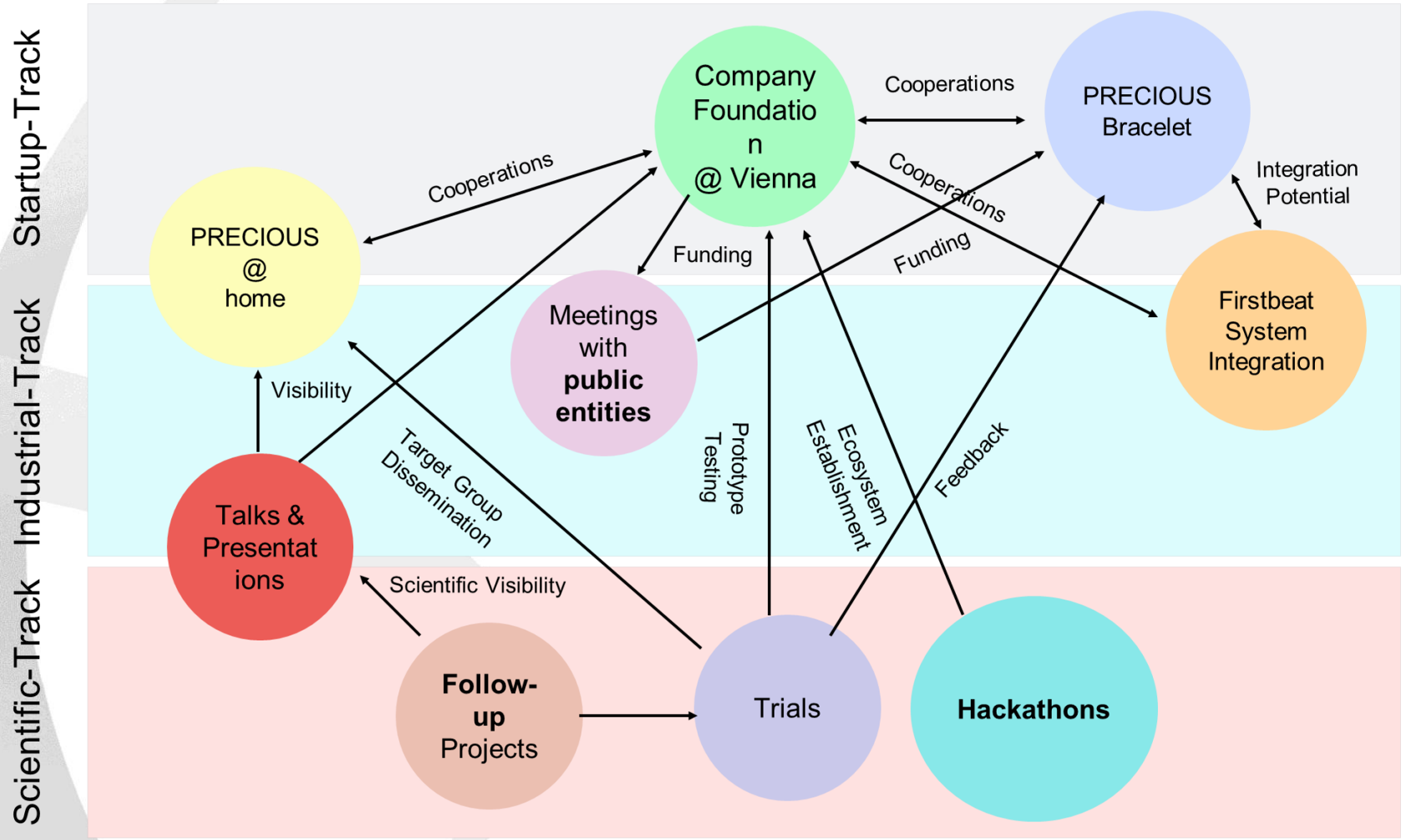
The Overall Picture



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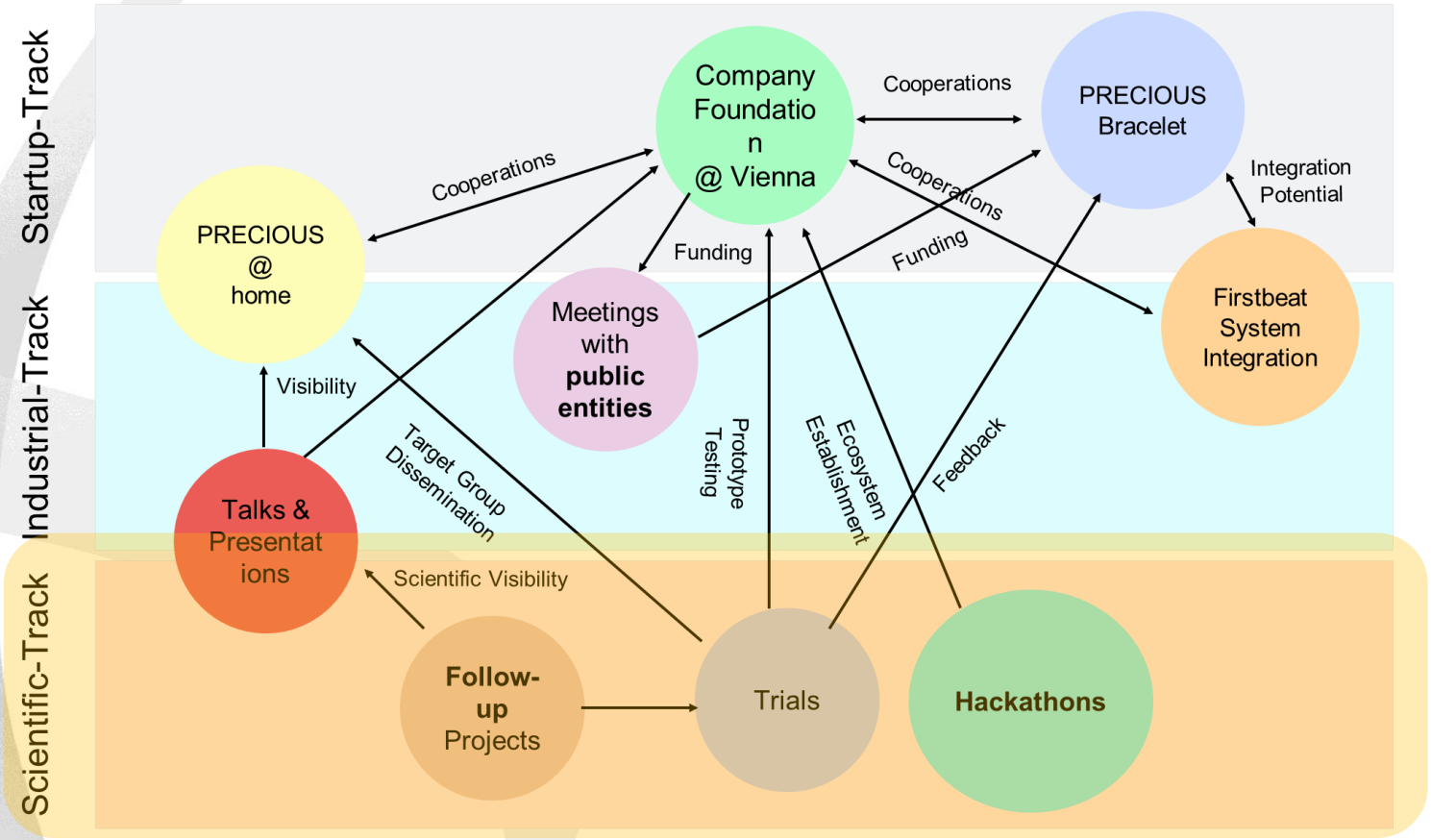
Scientific Track



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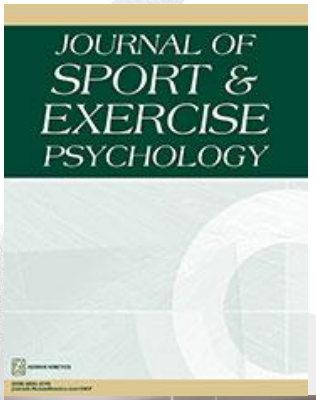
Scientific Dissemination

- Numerous posters, conference presentations and publications targeting a scientific audience



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eHealth Hackathon

- On the 23rd of September, UNIVIE hosts a **eHealth Hackathon** with the purpose of *evaluating PRECIOUS platform* from a developer's perspective
- For this purpose we've built a **development environment** facilitating the creation of health apps for our platform, which will be used during a 24h coding marathon

http://hackathon.cs.univie.ac.at/

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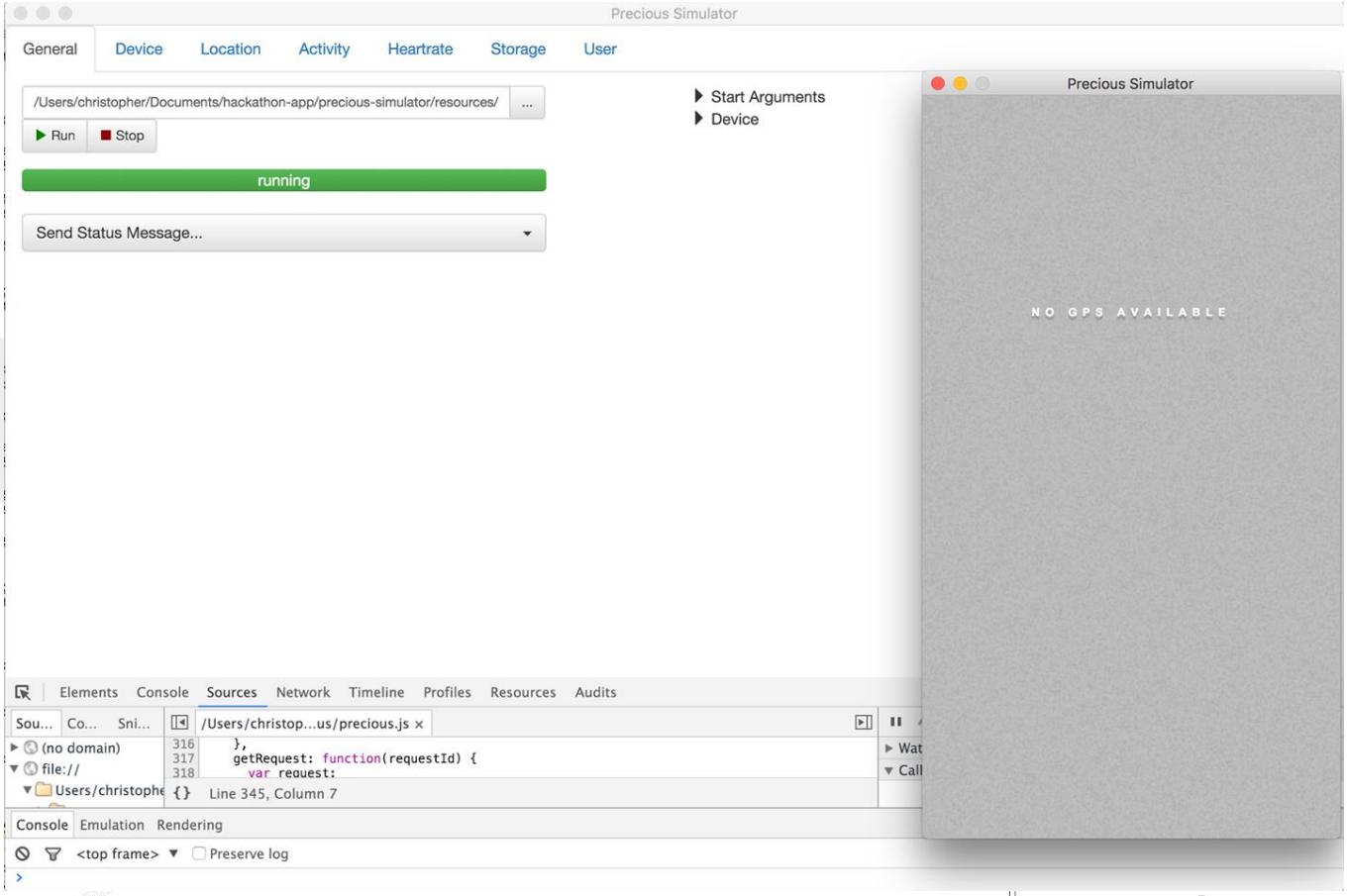
eHealth Hackathon

- The tool greatly simplifies app creation via HTML/JS/CSS
- Rapid-prototyping
- Access to native sensor data via APIs



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Follow-up projects

UNIVERSITY OF HELSINKI

- Meal logger collaboration with Keegan Knittle's grant proposal.

- Virtual hospital collaboration of HUS - The Hospital District of Helsinki and Uusimaa.

HOSPITAL DISTRICT OF HELSINKI AND UUSIMAA

- Finnish Academy funded project "*Self-determined motivation for work and health: investigating fluctuations and identifying effective strategies for motivational self-management*" 2016-2020 led by Dr Nelli Hankonen.

ACADEMY OF FINLAND

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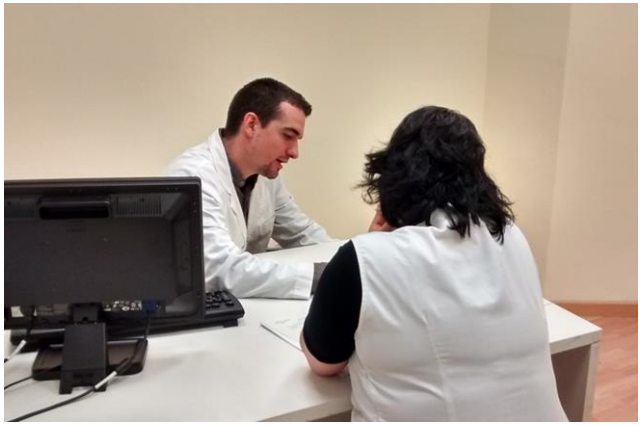
Follow-up projects

Vall d'Hebron
Institut de Recerca
VHIR

- **Clinical trial** with a representative sample of **pre-morbid obesity patients** is being designed.



- To **provide knowledge and training to developers of digital health solutions** about how to adapt motivational strategies to increase adherence in healthy lifestyles (research project)

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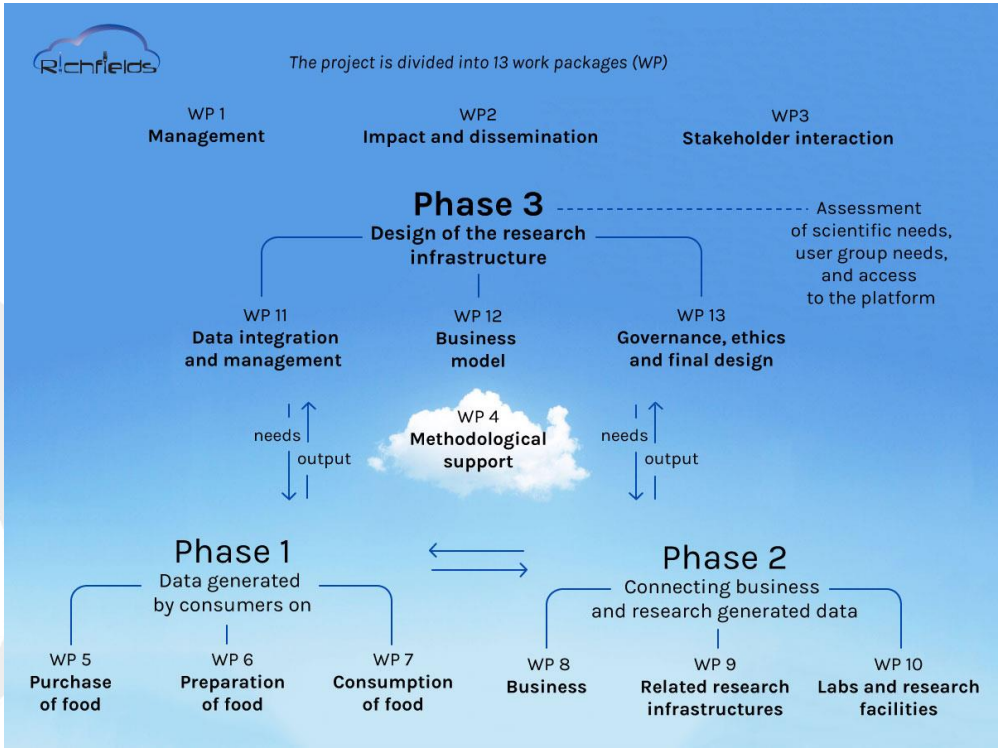
Follow-up projects

- RICHFIELDS (H2020)
  - Supporting WP9 (Connecting with Related Research Infrastructures), leading case study 4 that will collect data related to food intake in addition to information about physical activity, stress and sleep behaviour (through the PRECIOUS platform)

www.richfields.eu



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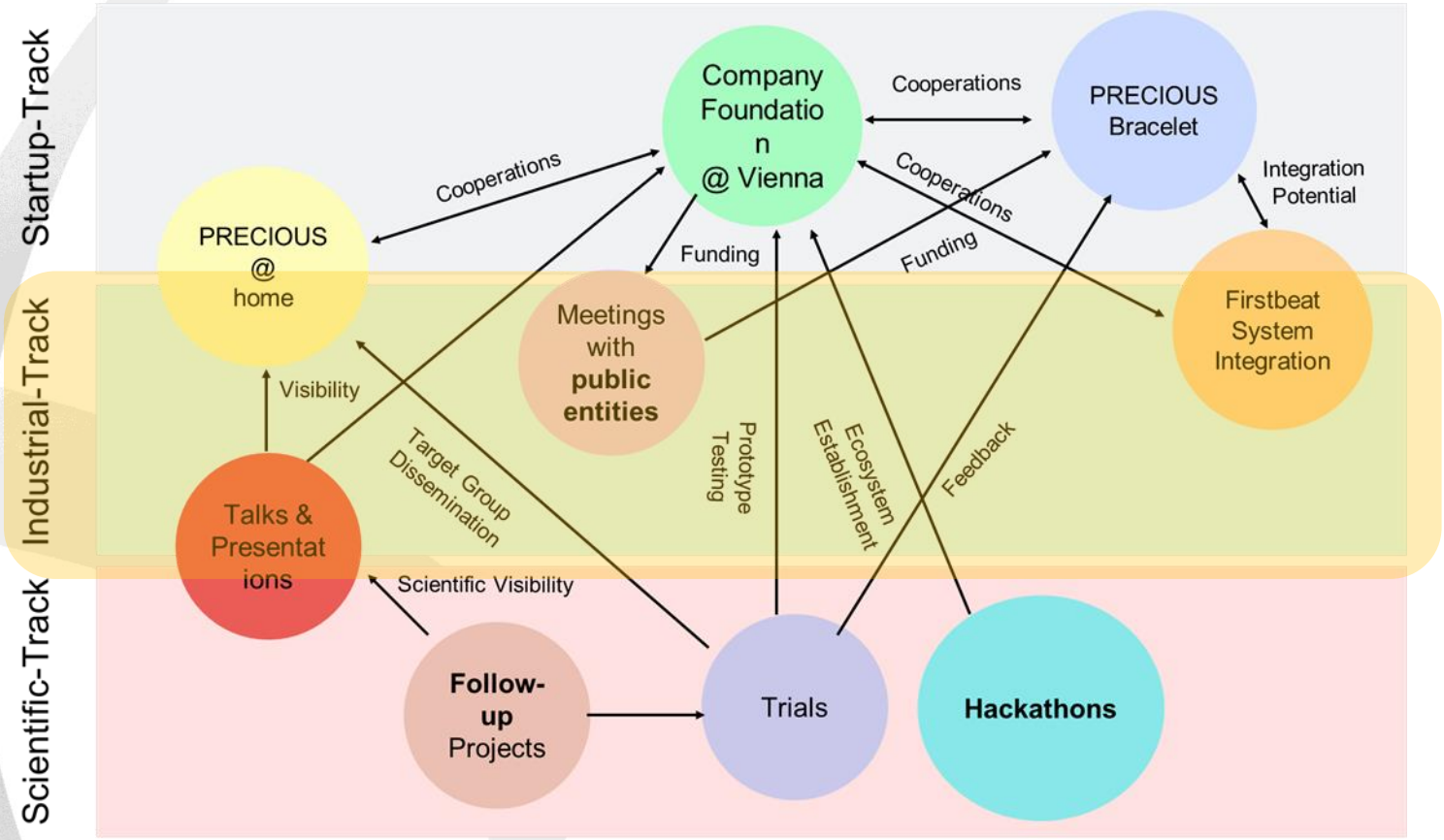
Industrial Track



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eHealth Industry Workshop

- 28th January 2016, Next Generation eHealth, Vienna
  - More than 50 people from insurance, government & private sector
  - Presented results, ecosystem opportunities
  - Live demos, hands-on, interactive app-design workshop

universität wien

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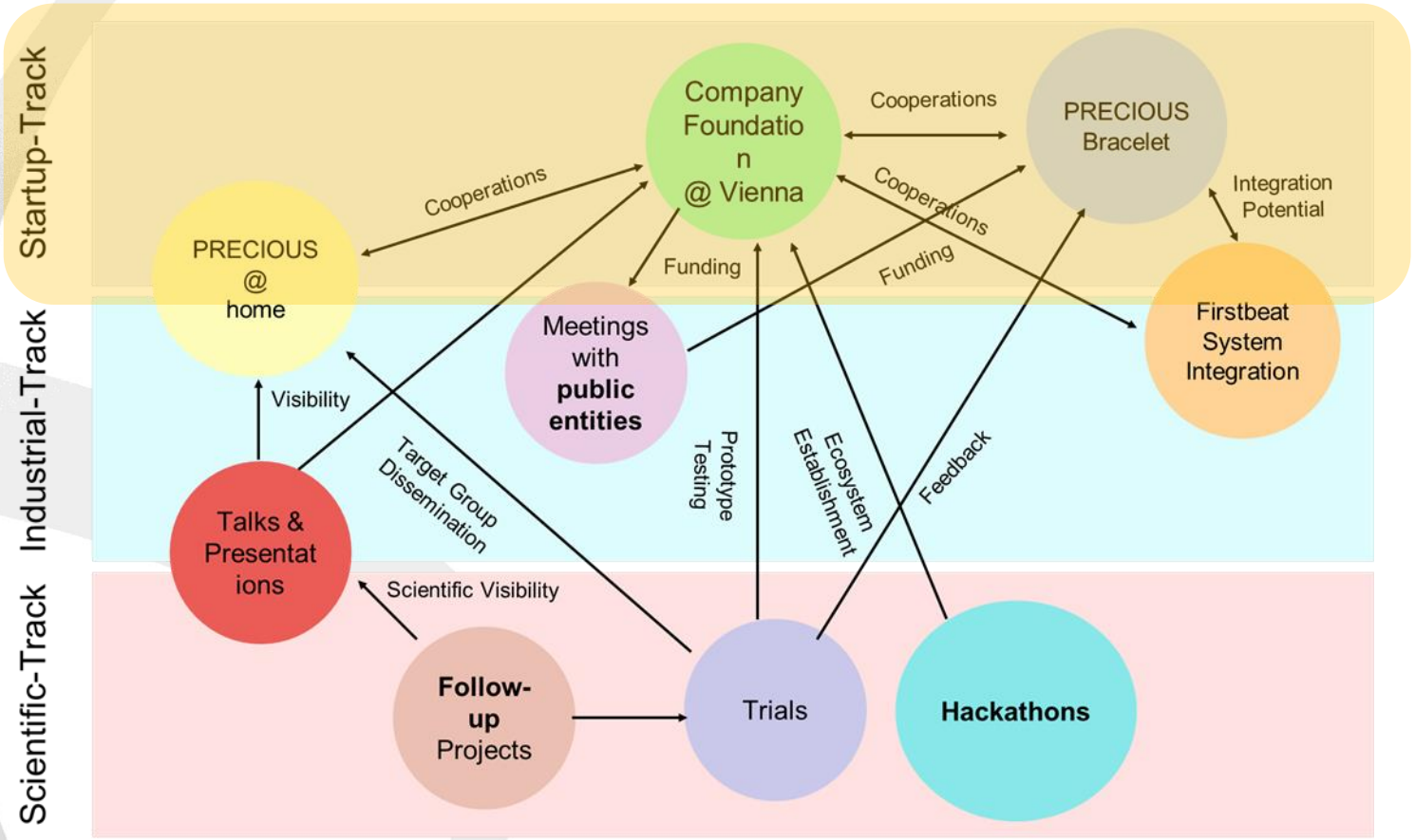
Startup Track



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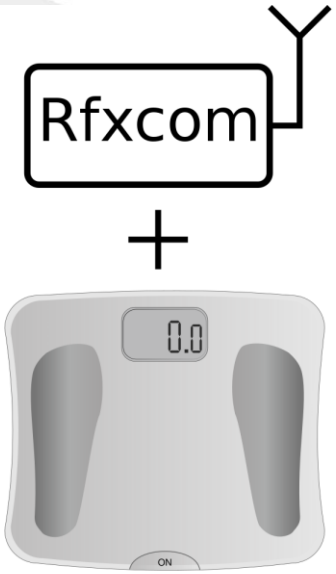
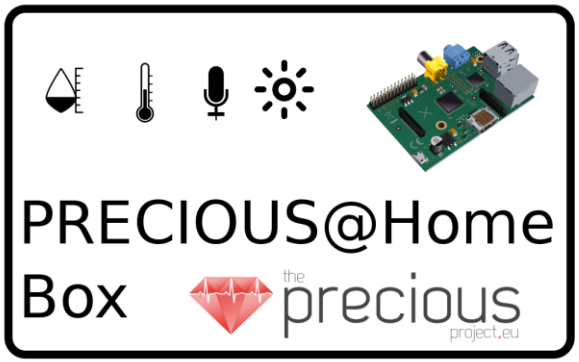
PRECIOUS Home Box

Presentation

- User context characterization (Temperature, Humidity, Light and sound level)
- User feedbacks (personalized user notifications: smartphone, text message on TV, light, etc...)





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PRECIOUS Home Box

Prototype Costs

Component	Price (TVA free, Euros)	Unit	Total
SEN51035P: Humidity and Temperature	12,5	1	12,5
SEN10171P: Digital light sensor	8,25	1	8,25
ROB51043P: Vibration motor	2,5	1	2,5
SEN02281P: Loundness sensor	4,92	1	4,92
Shield GrovePi	22,92	1	22,92
Cables (lot 5 cables)	2,42	1	2,42
RaspberryPi model B	25	1	25
			78.51
Body Weight Scale, GR101 Oregon Scientific + Rfxcom	99 + 107.95	1	**206.95**
			285.46

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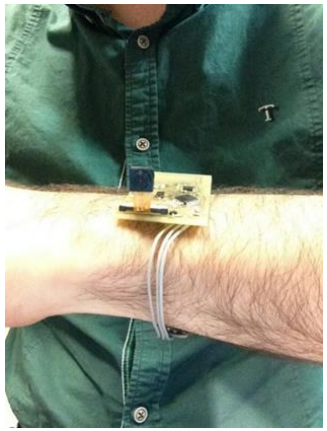
Wearable for Food Detection

Aalto University
School of Electrical
Engineering

- Prototype developed and tested at Aalto

- Bittium Wireless engaged to assess the bracelet design, provide quote for production of 100 prototypes etc.

Bittium



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Part 2: Future Research Directions

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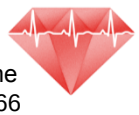

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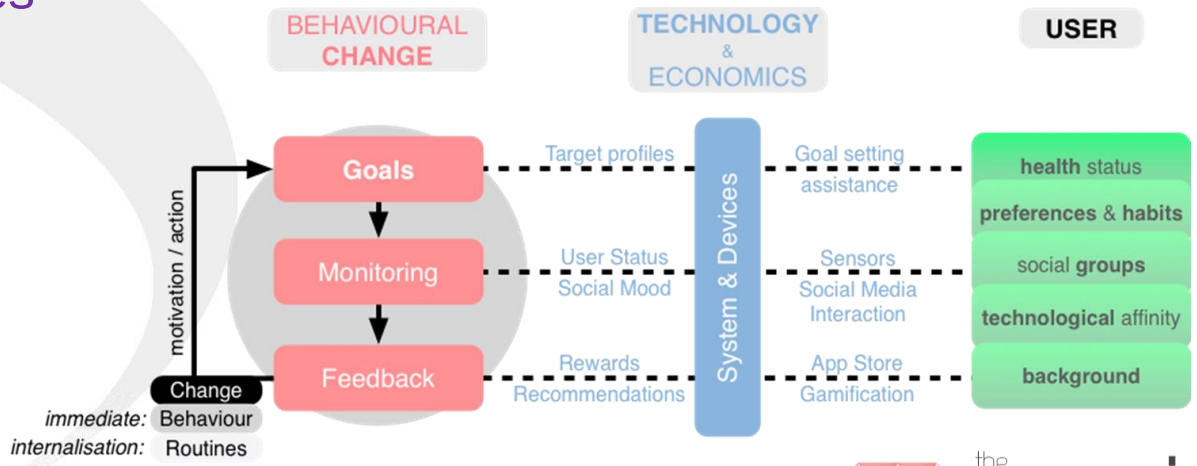
Some Takeaways from PRECIOUS

- Digitisation of **behaviour change techniques** (BCT) is a useful tool in mhealth settings
  - Faster exchange between: evidence from science (BCT's) –> practical ideas –> user experience -> pilot to mHealth –> user experience –> changes -> implementation
  - Implementation of digital BCT to mHealth (e.g. with Smartphones) compares favourably to "face to face" approaches



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Some Takeaways from PRECIOUS

- **Collaboration** between app developers and theoretical/clinical researchers is essential since the first stages of any health app.
- **Adapting motivational frameworks** into an app architecture is **challenging** but possible.
- The test of measures such as **app usability and acceptance** is necessary in more **early stages**

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Some Takeaways from PRECIOUS

- **Gamification** is a strong motivational element.
  - Borrow gaming concepts (e.g. goal setting, progress, competition, achievement and rewards) to quantify and promote behavioural change
  - Use of social aspect (networks, small groups) in mHealth

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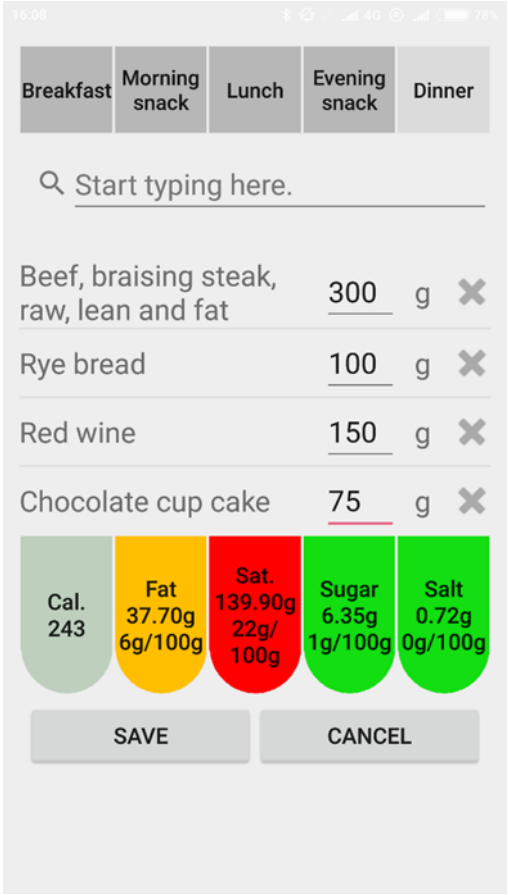
Some Takeaways from PRECIOUS

- Accurate measurement of the energy intake (kJ or kcal) of a person in day-to-day life is complex

- High penetration of smartphones makes them an ideal platform to enhance health interventions
  - Advances in smartphone sensors, paired wearables etc. still required for food intake monitoring



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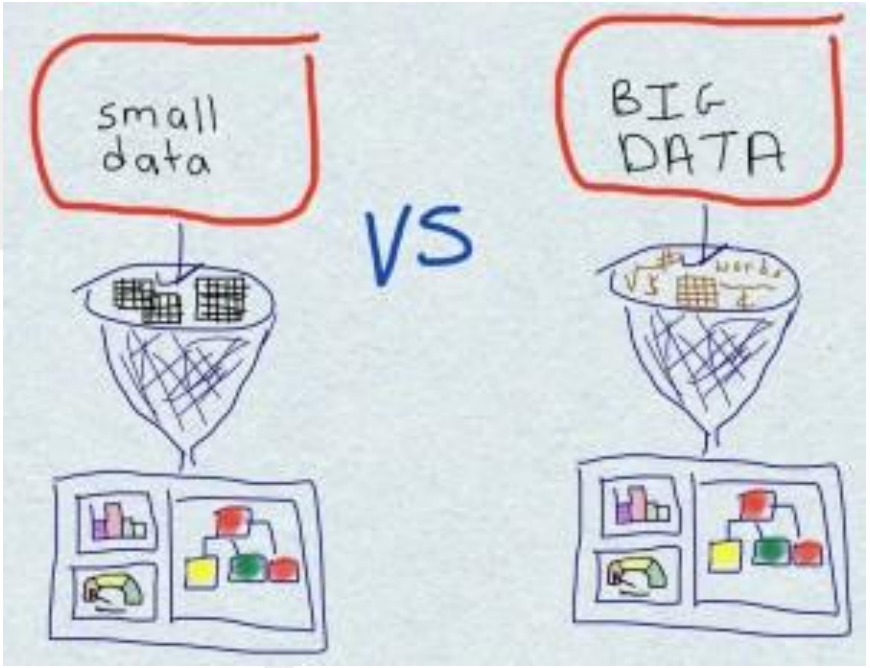
New Research Directions

- Decision making based on ***small data***
  - Quality vs. Quantity
  - Add a ***user context***: improve meaning and relevance of data
  - Flexible dynamic non-predefined data handling



http://www.beautifulinsanity.com/small-vs-big-data/

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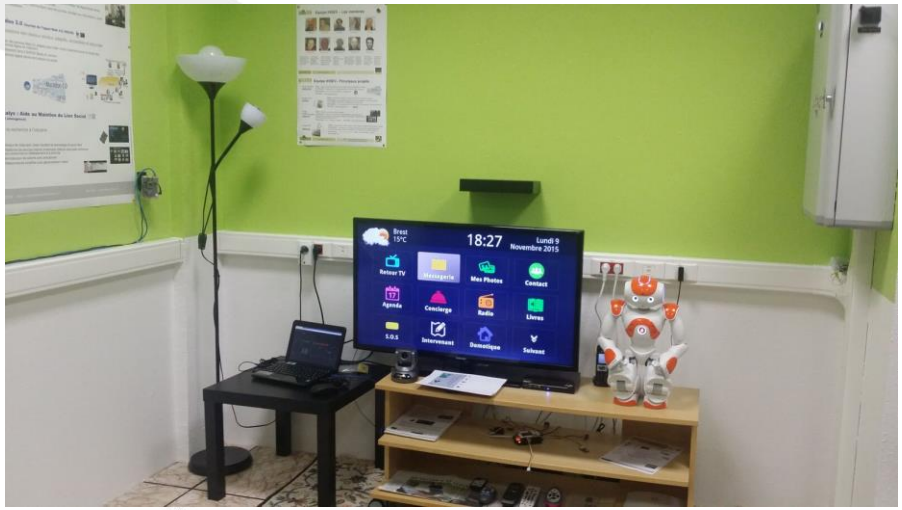
New Research Directions

- **Humanoid robots** in the user environment
  - **Decision sharing** between human and system
  - **Enhance adherence of the user**; embody recommendation system, coach, support…
  - Maintain benefits on the long term: more autonomy, self-learning capabilities with humans
  - Strong technical integration with home and connected objects



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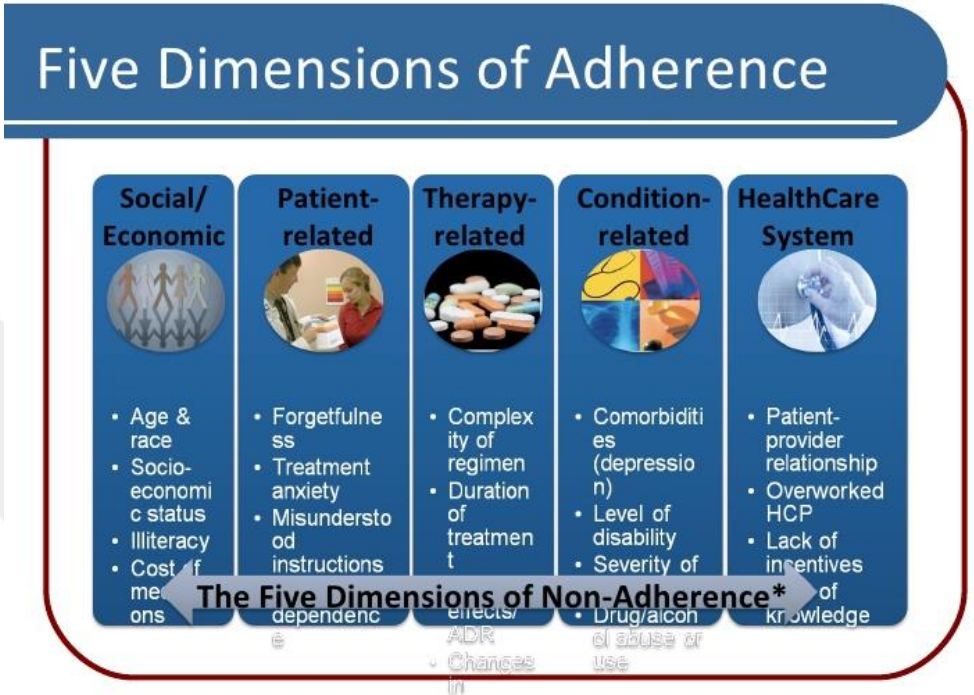
New Research Directions

- The **framework of the app could be expanded** to other topics (stress management, therapeutic compliance etc.)



Adapted from the Foundation for Managed Care Pharmacy

*Adherence to long-term therapies: evidence for action. World Health Organization 2003

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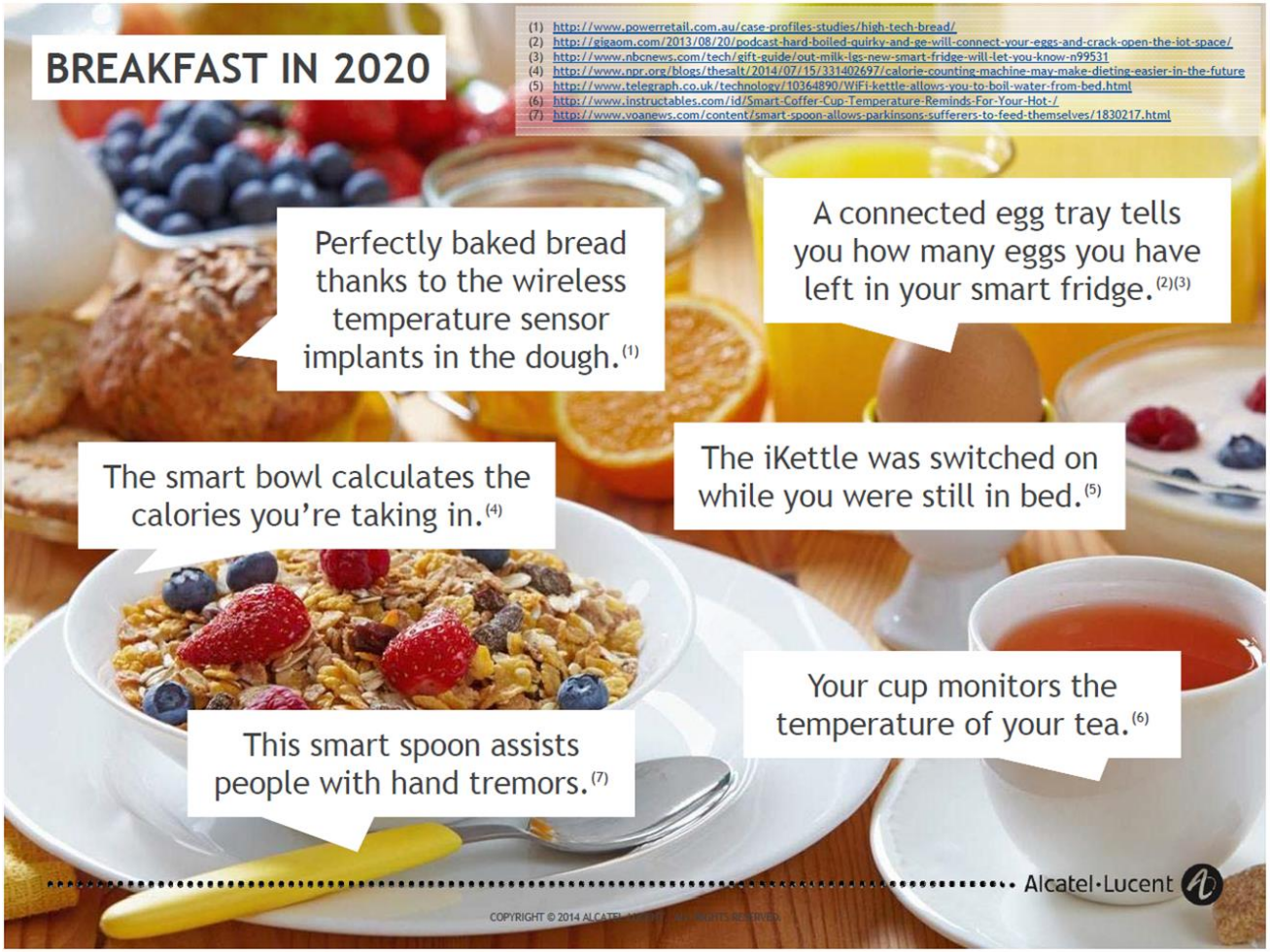
New Research Directions

- Advances in sensing and managing of large number of health/behavioural sensors (massive M2M, health IoT, 5G)



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Supplementary slides

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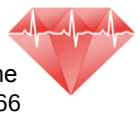

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