



# Development of a preventive healthcare system to promote healthy lifestyles: measurement of food intake

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# Overview

- Introduction to the project (PRECIOUS)
- Self monitoring of food intake
  - Methods & challenges
  - Role of technology
- Approaches in PRECIOUS



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

# www.thepreciousproject.eu

Provide a preventive healthcare system that will improve the health of the user, and deliver cost savings in the public health sector

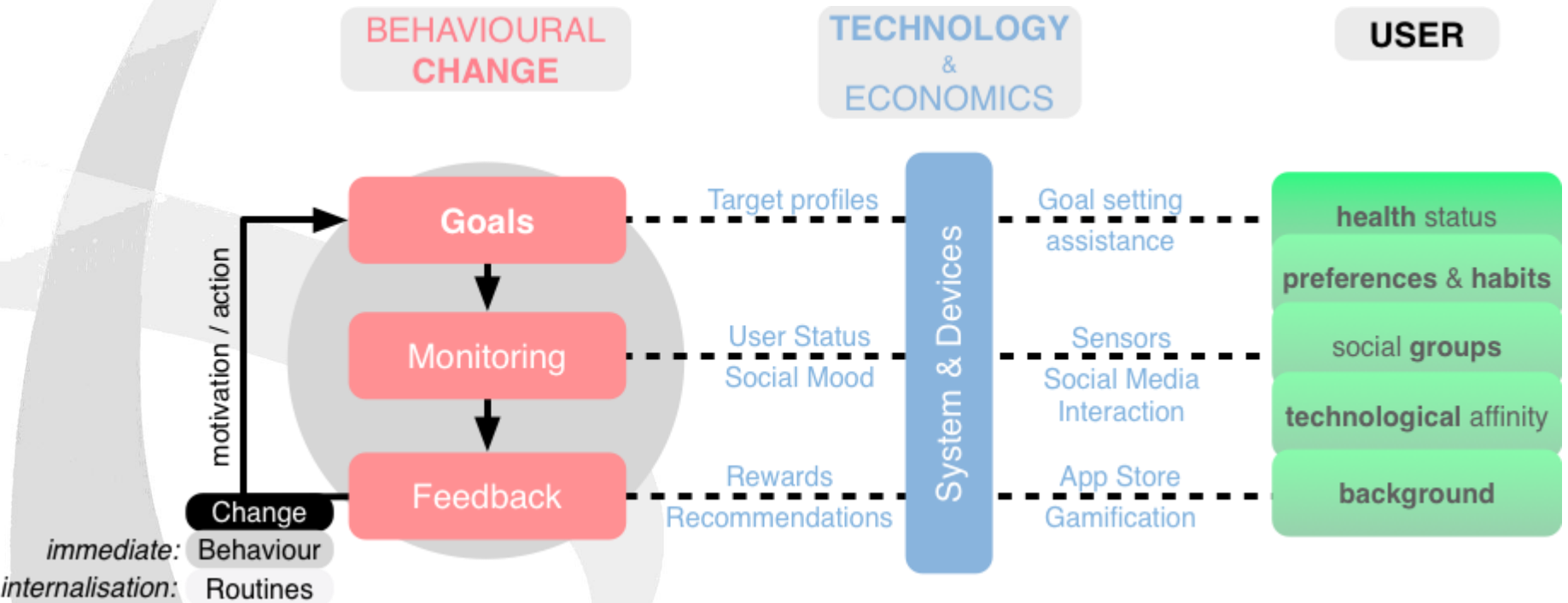


Nov 2013 to  
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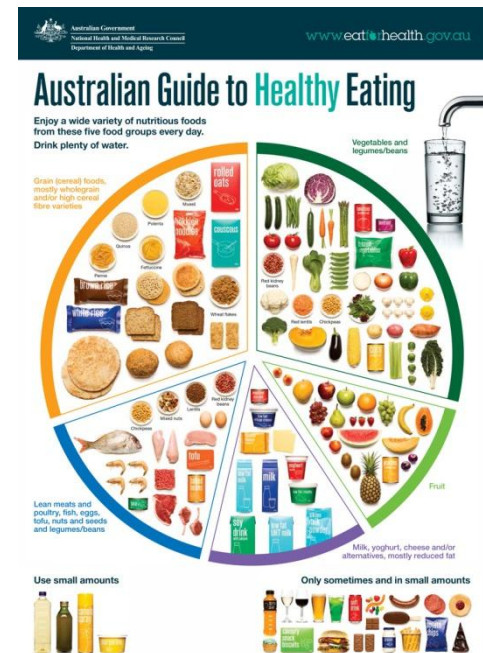
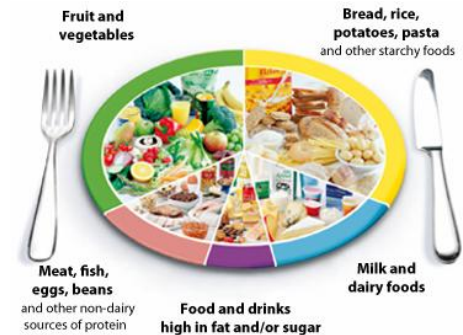
# The big picture



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# Food intake and health

- Diet strongly linked to health
  - In particular obesity and related complications
- Factors
  - Total energy intake
  - Balance of nutrients / food types
  - Energy density
  - Portion size



# Monitoring food intake

- Self monitoring recommended to improve dietary habits
- Current methods
  - Mostly diary / food log & barcode scanning
  - Burdensome for user
  - Relies on quality of data (in and out)
  - Majority don't motivate
  - Lack personalised advice
  - Is all information useful / relevant?



# Key research questions

- How can we collect regular food intake data with minimal user input?
- What information does the user need?
- What information does the user want?





# How could technology help?

- Portable
  - On-the-go monitoring
- Connected
  - Rapid dissemination of information
  - Links with health professionals
- Fun
  - Games / graphics / competition / social
- Transparent monitoring?





# PRECIOUS approach

1. Gather user opinions
2. Review & test current food intake tools
3. Design a user friendly food intake tool
  - Listen to user feedback
  - Reduce recording & information burden
  - Use gamification to assist learning



*“Well I’m concerned about my weight”*



*“I’m standing there and I take it because you think ‘oh I fancy that’ and the minute you’ve eaten it you think oh well actually I didn’t really need it I’m going home to have my tea”*



*“I eat my lunch in the canteen, and the portions there are quite big, so, I want to bring lunch from home now”*



*“If I was to exercise regular then I may not be so inclined to put weight on”*



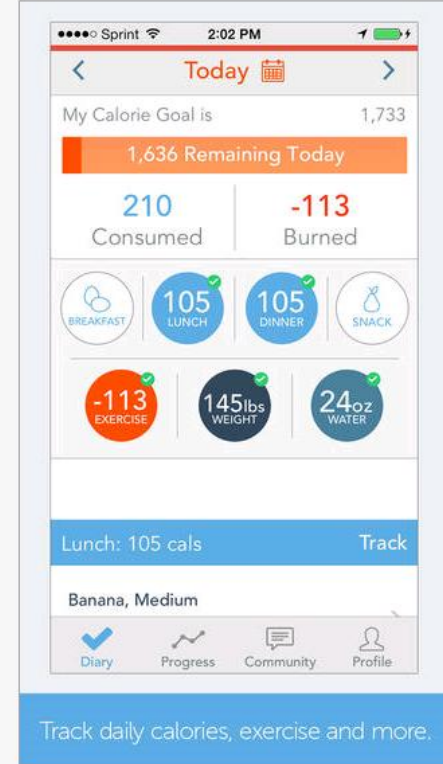
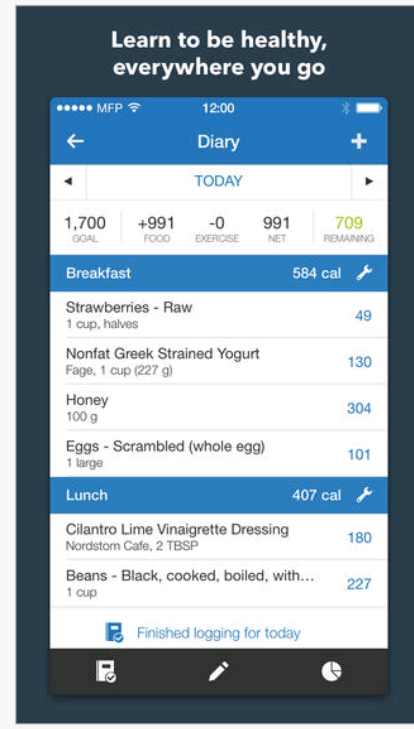
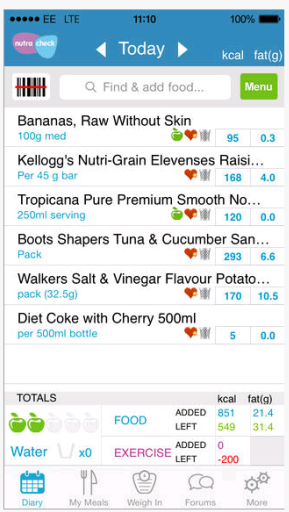
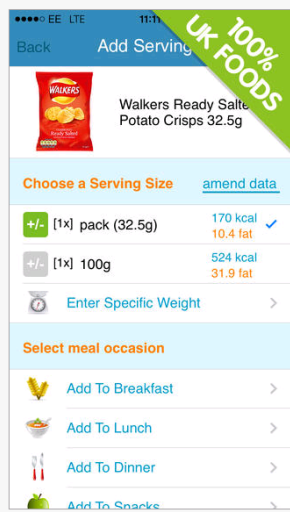
*“Eat some fruit instead of some, starch or bread or cakes or anything like that”*



## Functionality of the technology

1. To control calorie intake & portion size 😊
2. Link calorie intake, nutrients, weight gain and body shape 😊
3. Link calorie intake to exercise 😊
4. Scan product labels or menus 😊
5. Food diary & recommend healthier alternatives
6. Message alert e.g. consumption Vs goals
7. Visual output, simple, easy to use
8. Customise the programme

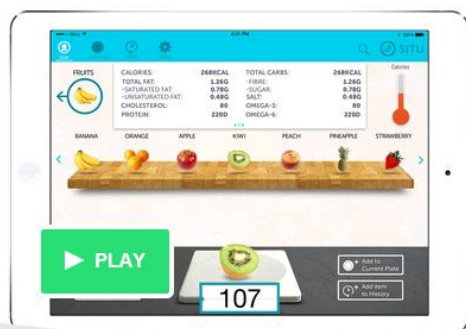




Market examples from Apple App Store (July 2014)



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**LAST DAY!!**



Novel tools /  
tools under  
development



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# Tool development: Smartwatch concept



- Based on capturing images
  - Camera + accelerometer & gyroscope
  - Digital image processing to identify food type
- Communicate with PRECIOUS via Bluetooth, Wifi or Internet
- Android software for prototype





# Gamification

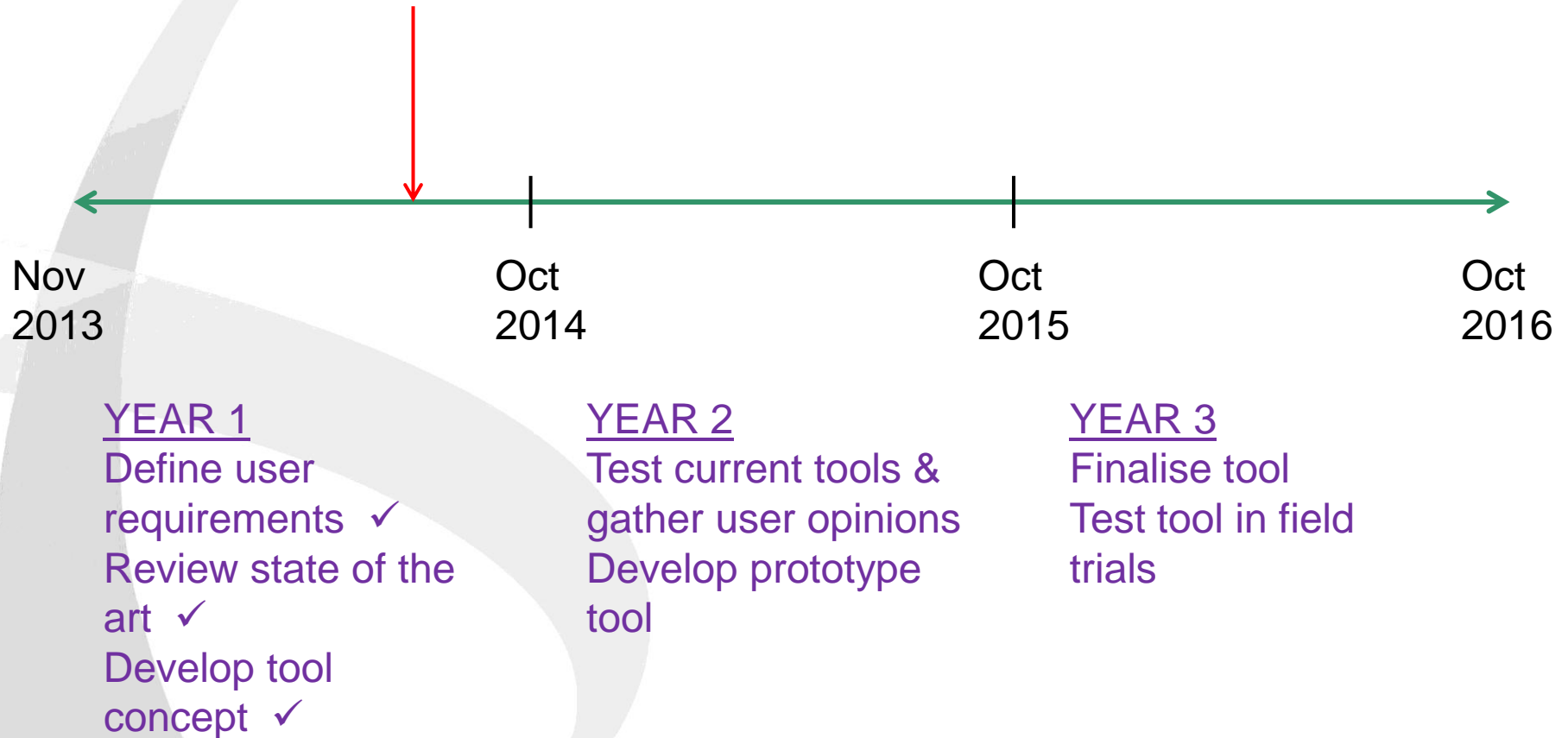
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- Examine whether a game can be used to:
  - Enhance food knowledge & increase motivation towards a healthy diet
- Rank food items based on nutritional value
  - Personal avatar gains/loses weight or energy/power
- Learning assessed using multiple choice questions given during the game
- Measure changes in motivation-related physiological responses to food images



# Summary



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# Thank you to the PRECIOUS consortium...



Aalto University  
School of Electrical  
Engineering



universität  
wien



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# Any questions?



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