



newsletter

Welcome to PRECIOUS

Healthier lifestyles – including more exercise, a better diet and reduced stress – are associated with the reduced risk of diseases such as type 2 diabetes and cardiovascular disease. However, adopting healthier behaviours is a challenge! Advances in technology have made it easier for individuals to monitor lifestyle attributes (e.g. through smart phone applications and wearable technology). One of the major challenges is, however, motivating people to make changes before risk factors develop into life-threatening and costly diseases.

To solve this challenge, PRECIOUS aims to improve motivation using a combination of motivational interview and gamification principles, as well as creating a personalised system that adapts to the users' goals and preferences. The system will collect information about the user from a variety of devices and applications (sensors), which measure food intake, physical activity, stress levels and sleep patterns. Links between these key lifestyle aspects are important in delivering an overall picture of the users' health. The system, and its sensors, also needs to be user-friendly and reduce the burden of recording where possible.

The main objective of PRECIOUS is to provide a preventative healthcare system that will improve the health of users, and deliver cost savings in the public health sector.

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In the spotlight: User requirements

An important aim of PRECIOUS is to **deliver a user-centred solution for preventative healthcare**. Therefore, one of the first tasks in PRECIOUS was the development of a list of user requirements. This list describes the features and functions the system should deliver to encourage healthier behaviours in a diverse range of users.

This task was approached through one-to-one discussions with potential end-users in a dedicated consortium workshop at the 1st Plenary Meeting, held at Campden BRI, Chipping Campden (UK) in April 2014.



Chipping Campden (UK)

We are focusing initially on the requirements of four distinct user groups; **1) young, single working professional, 2) family unit, 3) retired couple and 4) student**. Each of these groups will have varying requirements that reflect their life-stage, day-to-day routines, key health concerns, and attitudes towards technology.

Analysis of information gathered during the end-user discussions is on-going and the results will be reported in July 2014. These results, and the list of user requirements, will be made publically available via the PRECIOUS [website](#).

The list of user requirements will be used to develop a prototype system that will be tested in a proof-of-concept study.

Progress and achievements

Kick off meeting

The PRECIOUS kick-off meeting took place on 3rd-6th November 2013 at Aalto University, Helsinki (FI). Key outputs included logo design (as pictured below) and website development.



During this meeting, the consortium also discussed ideas for system architecture and the virtual individual model.

Motivation via gamification

The University of Helsinki (FI), in collaboration with the University of Vienna (AT), is creating a game-like platform, the aim of which is to engage, motivate and educate people about a healthier diet. The initial game design has been completed and programming of the first version is underway. Pilot tests are scheduled for May 2014, and the first laboratory experiments will take place in June 2014.

The design is shaped around the concept of gamification, an innovative approach that has been shown to be successful in various contexts. Its success is attributed to placing the individual at the centre of the action. Furthermore, the game will use state-of-the-art motivational and behavioural change techniques, originating from social psychology theories, to trigger learning and behaviour change. For instance, customised

feedback based on players' choices will be provided; working on the principle that tailoring and personalisation are factors that enhance the learning experience.

Learning and motivation will be assessed in terms of players' physiological responses during the game, as well as using questionnaires and memory tests at the end of each game session. Evidence from media and games studies suggests that physiological measures, such as electroencephalogram (EEG), facial electromyography (EMG) and electrodermal activity (EDA), can detect changes in body activation. It is thought these measures can be used to monitor cognitive processes, including attention, appraisal states, approach/withdrawal motivations, and emotions. Thus, the acquired data can be used to understand changes in preferences.

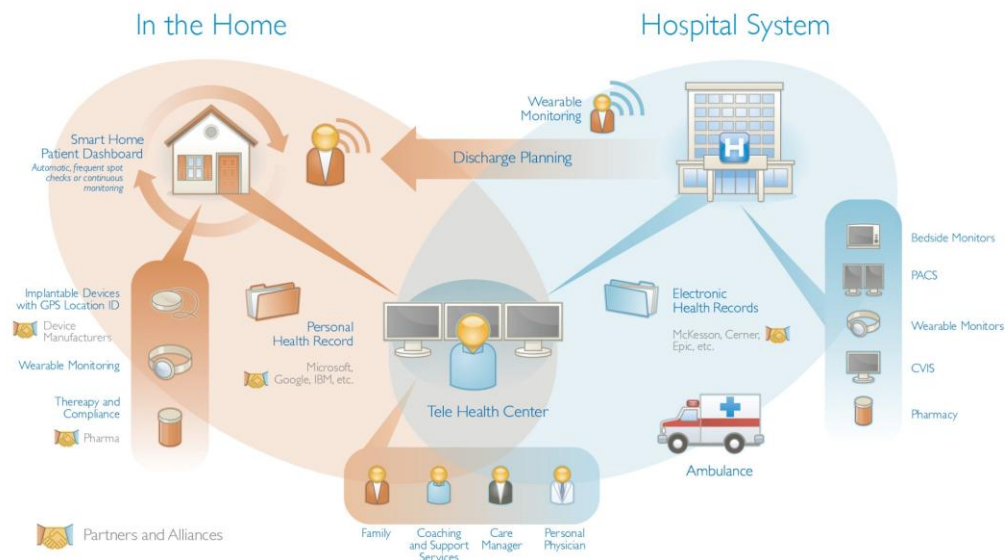
Connect with PRECIOUS

The PRECIOUS web site (www.thepreciousproject.eu/) provides regular project updates, links to publications, and information regarding upcoming events.

Information about PRECIOUS, as well as related projects and technologies, can also be accessed via our social media accounts. We are on both Facebook (www.facebook.com/thepreciousprojecteu) and Twitter (twitter.com/EU_Precious). We have also set up a dedicated LinkedIn group for interested researchers and experts in ICT, and health and psychology fields. For an invitation to this group, please contact Carlos Ramos (cr@eurofir.org) or send your request via LinkedIn (www.linkedin.com/groups/PRECIOUS-project).

PRECIOUS Architecture: Navigating the Interoperability Minefield

Many innovative health device solutions and platforms have failed to gain widespread adoption due to limited, or lack of, interoperability with other selections in the same application area. Interoperability should enable connected health devices to acknowledge each other and exchange health data seamlessly (transport interoperability), and the data should be understandable for all recipients (semantic interoperability). The personal health community (health device companies, mobile operators, IT companies, health regulators etc.) has risen to this challenge through the development of Continua Design Guidelines within the Continua Health Alliance (www.continuaalliance.org/). These guidelines provide the means to implement connected health systems that merge previously disconnected Home and Hospital domains (see Figure 1). Recent adoption of the Continua guidelines as a standard by the International Telecommunications Union (ITU) is a clear endorsement of the global significance of this initiative.



Future of connected health (Source: Philips Research Europe)

PRECIOUS is taking a similar approach by formulating an architecture that leverages existing standards, such as those packaged within the Continua guidelines. However, there are new challenges in PRECIOUS, as the architecture must integrate home monitoring devices with environment data that fall outside the Continua framework. The interoperability landscape in the Home Automation space is less harmonised, with a multitude of industry groupings competing for dominance (enOcean Alliance, Zigbee Home Alliance, Z-Wave Alliance, etc.). The PRECIOUS consortium is in the process of understanding the dynamics behind these different initiatives with the aim of formulating an architecture where components are unencumbered by vendor lock-in and readily accessible by all.

News from the partners

EuroFIR AISBL

In March 2014, EuroFIR AISBL hosted a scientific symposium “**Better Food Data and Tools to Support Food Health Research, Labelling and Health Claims in Europe**”. PRECIOUS was also presented at this symposium, which brought together food and health experts from academia and research centres across Europe.

Additionally PRECIOUS and QuaLiFY presented at EuroDISH '**Outlining the European Research Infrastructure for the Food and Health Domain**' on 19-20th May 2014, Thon Hotel Brussels City Centre (BE)

The objectives of the EuroDISH workshop are to evaluate identification of existing European infrastructure (Phase 1), and identify the gaps, needs and requirements for newly or future identified food and health research infrastructures (Phase 2). PRECIOUS (611366) and QuaLiFY (613783) will be presented as examples of the potential exploitation arising from existing infrastructure (e.g. EuroFIR AISBL FoodEXplorer), and the development of commercial tools and services underpinning resources for consumers (e.g. Smartphone apps) and other stakeholders (e.g. dieticians).

Europe faces a major burden of increasing diet-related public health problems. Improving health through lifestyle, food and nutrition can help combat such issues, but requires high quality research to design effective strategies. EuroDISH is a three-year project funded under the EU 7th Framework Programme that aims at integrating of existing food and health research infrastructures, as well as the development of new ones in order to provide comparable EU-wide nutritional data and innovative multi-disciplinary research.

Upcoming events

International Conference on Motivational Interviewing, 16-18th June 2014, Amsterdam (NL)



Dr Pilar Lusilla (Hospital Universitari Vall d'Hebron – Institut de Recerca VHIR, ES) will present a poster entitled *"Integrating motivational techniques in gamification systems for behaviour change: PRECIOUS"*.

17th World Congress of Food Science and Technology & Expo, 17th-21st August 2014, Montreal (CA)



Sarah Kuczora (Campden BRI, UK) will deliver an oral presentation entitled *"Development of a preventive healthcare system to promote healthy lifestyles: measurement of food intake"*.

CREATE Workshop, 24-26th August 2014, Innsbruck (AT)



Johanna Nurmi (University of Helsinki) will participate in the CREATE workshop: *"Leveraging mobile technology and social media in behavioral research"*. The three-day workshop has been crafted to cover the core aspects of social media and mobile technology that are relevant to research in behavioral science. The workshop will also introduce informed approaches in the selection of commercially available apps from the perspectives of varying user groups.

European Health Psychology Society EHPS Conference, 26-30th August 2014, Innsbruck (AT)



Johanna Nurmi (University of Helsinki) will deliver an oral presentation entitled *"Physical activity: the role of autonomous motivation and self-regulation techniques"*.

2nd plenary meeting, September 2014



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The second PRECIOUS Plenary Meeting will be held at the University of Vienna (AT). This meeting will focus on the technical system design and techniques that will be used to build motivation.

Consortium partners

Co-ordinated by AALTO University (FI), the PRECIOUS consortium includes eight beneficiaries from academia, research centres and industry. Combined research expertise covers information communication technologies, physiology, nutrition, motivational techniques and cognitive analysis.



Aalto University



Campden BRI



European Food Information Resource



Firstbeat



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Institut de Recerca VHIR



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The University of Helsinki



University of Vienna



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