

MyHeart - Fighting cardio-vascular diseases by prevention & early diagnosis

MyHeart is an FP6 Integrated Project under Philips leadership, aiming to develop intelligent systems for the prevention and monitoring of cardiovascular diseases. The project develops smart electronic and textile systems and appropriate services that empower the users to take control of their own health status.

At A Glance: MyHeart

Fighting Cardio-vascular Diseases by Prevention and Early Diagnosis

Project Coordinator

Joerg Habetha

Philips Research Laboratories

Tel: +49-241-6003.560

Fax: +49-241-6003.519

Email: Joerg.Habetha@philips.com

<http://www.hitech-projects.com/euprojects/myheart/>

33 Partners from: Belgium, Finland, France, Germany, Great Britain, Italy, The Netherlands, Spain, Switzerland, United States of America

Duration: Dec. 2003 – Sep. 2007

Total Cost: €35m

Further Information

- **IST Research: eHealth**
DG Information Society & Media
Unit H1
Tel: +32-2-298.62.07
Fax: +32-2-296.01.81
health@cec.eu.int
http://www.cordis.lu/ist/directorate_c/ehealth/index.html
- **Europe's Information Society: Thematic Portal:**
http://europa.eu.int/information_society/

Cardiovascular diseases (CVD) are the leading cause of death in developed countries. This disease class includes myocardial infarction, congestive heart failure, arrhythmias and stroke. Over 20% of the European citizens suffer from chronic CVD, while 45% of all deaths in Europe are due to CVD. Europe spends annually billions of Euros on the treatment of CVD. With the upcoming aging population, Europe faces the challenge of delivering high-quality healthcare to its citizens at affordable cost. While it is widely accepted that healthy and preventive lifestyle, together with early diagnosis, could systematically fight the origin of CVD, for cost-related reasons institutional points of care can currently offer only intermittent episodic treatment.

Cardio-vascular diseases are the leading cause of death in Europe

MyHeart aims to overcome this, by empowering the citizens to fight CVD with the adoption of preventive lifestyle and early diagnosis. With its innovative system-solutions for personalised care, *MyHeart* has the potential to modernise the European healthcare system and enable it to cope with future demographic challenges. Moreover, it contributes to the European excellence in the area of biomedical engineering and will provide the opportunity for the European industry to position itself as the leader in this field. On a social level, by empowering the citizens to take control of their own health status, *MyHeart* will offer them the opportunity to enjoy better quality of life and higher level of social integration and interaction.

The idea behind *MyHeart* is to apply continuous or periodic monitoring of vital signs, in order to gain knowledge about a person's health status. To achieve this, *MyHeart* integrates functional clothes with on-body sensors (textile and non-textile) and electronics into the so called **intelligent biomedical clothes**. These are capable of acquiring, processing and evaluating physiological data. The results are sent via a wireless personal area network to a mobile phone or PDA and from there to a server farm, which offers professional medical services. Depending on the diagnosis, recommendations are given to the citizen. In this way, the full functionality of the *MyHeart* system is realised. Such an approach towards integrated disease management has the potential to change the European healthcare system dramatically.

Consortium

The *MyHeart* consortium involves 33 partners from 10 different countries. It is a balanced multidisciplinary consortium of industry (including Small and Medium Enterprises (SMEs)), research institutes, academia and medical hospitals. Prominent industrial partners are Philips, with its medical and technological expertise, Nokia as a leading mobile device manufacturer, Vodafone (Foundation) as a leading service provider, and Medtronic, a world-leader in cardiac technology.

Concept-based innovation approach

The *MyHeart* approach is application-centred. Within *MyHeart*, the CVD application field has been clustered into five major areas, each area representing a prominent risk factor for developing CVD:

CardioActive: Reduce inactivity
CardioSleep: Improve sleep quality
CardioRelax: Reduce stress
CardioBalance: Reduce overweight
CardioSafe: Reduce morbidity by early diagnosis

MyHeart is composed of 16 autonomous application projects called **concepts**. Concepts are CVD applications tailored to a specific user group or customer segment (Figure 1). The user base includes people who want to stay healthy, people with a recognised risk for developing CVD, chronically ill people and people who have suffered a cardiac event. Examples of concepts are *Stroke prevention*, *Myocardial Infarction prevention*, *Obesity management* or *Outdoor rehabilitation*. Each concept team comprises a clinical partner, to guarantee medical excellence.

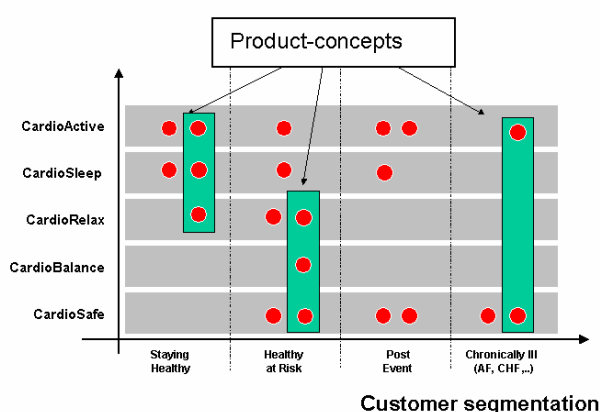


Figure 1: *MyHeart* application (concept) matrix

Each concept has answered five questions:

- **What** is the application/value proposition?

- **Who** are the customers and how to address them?
- **How** to do it technically?
- **Why** to believe in the concept (from medical, technical and economical points of view)?
- **Where** is the business?

At the end of the first project phase (18 months), mock-up systems have been developed for all 16 concepts. All concepts have also undergone a process of focus group assessment with end-users, professional service providers and medical professionals.

Technology for daily life

The technological needs for *MyHeart* applications span a wide range covering: monitoring of vital signs (ECG, respiration, skin impedance, etc.); body-worn, low-power, mixed-signal hardware which runs algorithms for detection of health status and prediction of acute cardiac events; user interfaces for citizens and medical professionals; low-power wireless links and server architectures for data handling at professional sites.

Expected end results

MyHeart is structured in three phases. Following the concept definition and testing in phase I, the most successful concepts will be selected and combined into 3-5 **product-concepts**. In the second phase, the selected product-concepts will be implemented and tested in clinical environments to demonstrate their effectiveness and feasibility in long-term test beds.

In phase III, the product-concepts will be validated in extensive test-beds and trials for long-term follow-up. Success will be measured in terms of either the predictive value of the acquired data or the reduction in the number of acute events. Benchmarks will also include parameters like the increase in physical activity and the reduction of hospitalisation days for acute events.

In addition, the cost benefits for the stakeholders in the healthcare delivery system will be assessed. The final outcome is expected to include documented test-beds showing the effectiveness and efficiency of the *MyHeart* approach, as well as the design of business propositions for the exploitation of the results. It is also intended to establish this healthcare delivery process into the medical guidelines for treatment, thus ensuring Europe-wide access to the outcome of the project. Furthermore, B2C (business to consumer) approaches will be evaluated to ensure that anyone can access the solution before general reimbursement can be achieved with the national healthcare systems.