

# MyHeart

## Fighting cardio-vascular diseases by preventive lifestyle & early diagnosis

**MyHeart is an Integrated Project 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.**

### Objectives of the project

Cardio-vascular diseases (CVD) are the leading cause of death in developed countries. Roughly 45% of all deaths in the EU are due to cardio-vascular diseases. With the ageing population, it is a challenge for Europe to provide its citizens with healthcare at affordable costs.

It is the aim of the **MyHeart** project to fight CVD by prevention and early diagnosis. A healthy and preventive lifestyle as well as early diagnosis of heart diseases could save millions of life years annually, reduce the morbidity significantly and, simultaneously, improve the quality of life of the European citizen. Prevention offers the opportunity to systematically fight the origin of cardio-vascular diseases as well as to improve the medical outcome after an event. Classical medical institutions offer only intermittent, episodic treatment, while prevention asks for a lifelong continuous change of habits and therefore for a continuous health-care delivery process. With its innovative system-solutions for integrated textiles, sensors and on-body electronics, the **MyHeart** project significantly contributes to the European excellence in the area of bioengineering and thereby to the Lisbon strategy of the EC.

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

### Project Description

**MyHeart** has taken a very innovative approach in ensuring the applicability of the project results in the real world. The consortium has started with a set of application ideas and only afterwards investigated the necessary technologies in order to serve these applications. In a new research field like "Personal Healthcare" it first had to be understood which applications are of the highest medical and commercial interest. For this reason the project started with 16 application ideas at the end of 2003, defined and investigated these concepts in detail and then carried out a testing and interview phase with users as well as medical and business professionals in the second project year (2005). This process led to a concept selection in mid-2005, during which 4 out of the 16 application concepts have been selected for further research and development in the remaining two project years.

The four product concepts have been defined in a way that they cover four different user segments:

- Healthy people
- People at risk
- People after an event
- Chronically ill people

### Scenario

Robert is 70 years old. He suffered from two severe heart attacks, which damaged his heart irrecoverably and turned him into a chronic heart failure patient. Last year he started to retain fluid in his body without noticing it, because his heart was too weak to maintain the fluid equilibrium in the body. After this experience, Robert is very interested in monitoring his disease more closely. The **MyHeart** system will enable physicians to monitor Robert's vital parameters on a daily basis. Signals will be taken while Robert is sleeping in the bed as well as by letting Robert wear a sensor-equipped shirt during part of the day. Robert will get instructions when and how to take measurements by his personal user device, which is also able to transmit the data via a mobile phone network to his physician. A professional user interface on the physician side will support him in detecting health problems, like a developing decompensation. The physician can act accordingly and e.g. adapt the medication dose that Robert has to take. This will significantly increase Robert's quality and duration of life and avoid unpleasant and costly hospitalizations.

The four product concepts that have been defined for these four groups are:

- “Activity Coach”: Making the most of your exercise both in terms of pleasure and health impact, anywhere, anytime.
- “Take Care”: Assessing and lowering your risk factors for cardiovascular diseases by vital signs monitoring as well as coaching and motivation.
- “Neuro Rehab”: Improving and shortening the rehabilitation process (motor and cognitive exercises) in the rehabilitation ward and in the patient’s home.
- “Heart Failure Management”: Improving quality of life and life expectancy of heart failure patients by early prediction of decompensation and improved patient (self-) management.



By September 2006 the prototypes for the four product concepts will be implemented and produced in the required quantities. In the last year of the project from October 2006 until September 2007, these prototypes and the associated concepts will be evaluated in extensive user test campaigns.

### Expected Results & Impacts

With long-term test beds, **MyHeart** will show how users employ the system over months and the success will be documented in terms of adaptation of healthier life-style and early prediction of acute events. The results will be benchmarked against clear outcome parameters like weight reduction, reduction in average heart rate, reduction in blood pressure and increase in physical activity.

In addition, the project will assess the cost benefits for the stakeholders in the healthcare delivery system. The final outcome will include documented test beds showing the effectiveness and efficiency and the design of business propositions for exploitation of the results. Additionally, 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.

#### Keywords :

Personalized health, prevention, telemedicine, wearable medical systems, textile biomedical clothes



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