

**NUADU**  
(ITEA ~ 05003)

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# Tele-healthcare can offer higher quality living

The NUADU project set out to explore the opportunities of using networked services to provide cost-effective and efficient healthcare and wellness services. Such applications could improve the quality of life for an increasingly elderly population and those suffering from major problems such as strokes. Results showed tele-monitoring with feedback provides highly effective support with a lower demand on healthcare personnel. However, questions remain on how to fund such systems.

Overall levels of public and private healthcare expenditure are continuing to rise faster than GDP in the EU. This is not helped by a rapidly aging population requiring costly long-term care and an increasing tendency for young people to be inactive, overweight or obese which, if allowed to continue, is likely to result in higher proportions of disorders later in life.

Chronic diseases such as diabetes, high blood pressure, congestive heart failure and dementia are a major factor, accounting for 75% of all healthcare costs and 85% of all deaths.

Technology can be used to educate and stimulate people to adopt a healthier lifestyle and so prevent such diseases. In addition, people are taking a greater interest in their own health. While traditional health services will have an increasing problem in providing sufficient cover, consumers appear more willing to invest themselves in a long healthy life with a high level of quality.

**HEALTH AND WELLBEING**

The main objective of NUADU was to see how innovations in electronics and information and communication technology (ICT) could contribute towards improving health and wellbeing. This ranged from those who would like to be more mobile and would like to do exercises supporting that, up to the elderly in care centres who require some kind of help or people who have had a major problem such as a stroke and need managed rehabilitation.

Applications envisaged were those that encouraged people to control successfully their own health and wellbeing. All these required support from three technologies:

1. Sensors – it is necessary to know something about the person being studied, either by using body sensors for heart rate or motion monitoring, or by visual sensors such as cameras;
2. Services – this could be a computer connected to a network which registers all the data that is measured and which can provide feedback to the patient or to a central service; and, in between,
3. Interconnections: hubs, wireless links, ....

The challenge was to bring these technologies together – to see what existed, how they could be combined to provide a solution, and to identify what was missing and then carry out new developments to make things even better overall.

NUADU involved 25 partners, each with its own range of in-house technologies. There had already been a drive for co-operation between these companies based on the need for an end-to-end approach to health problems, the concerns of care providers and the increasing use of sensors and networked services in medical care.

**FOCUS ON REAL APPLICATIONS**

A strong software element meant the project fitted well into ITEA. In addition, NUADU focused on real

applications. An important point was the emphasis not just on the technology but also on pilot sites and demonstrations as a key issue was how the technologies were appreciated by users – were they easy to use and user friendly.

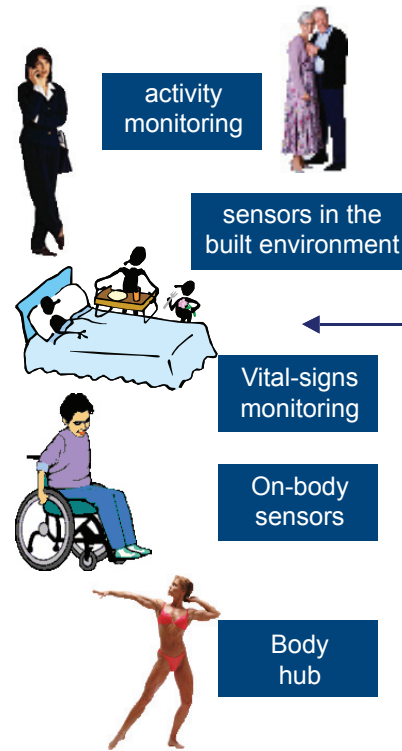
Seven pilot sites allowed a direct confrontation between technology and user, and enabled optimisation. These pilots covered:

- Preventative measures encouraging healthcare self-management by municipal workers in Espoo, Finland and self-management of nutrition, activity and weight by consumers in Valencia, Spain;
- Enabling independent living for the handicapped and elderly in Kunheim, France and for stroke victims in Hoensbroek, Netherlands; and
- Effective management of chronic conditions by monitoring of heart patients in Madrid, Spain using mobile terminals as they went about their daily lives.

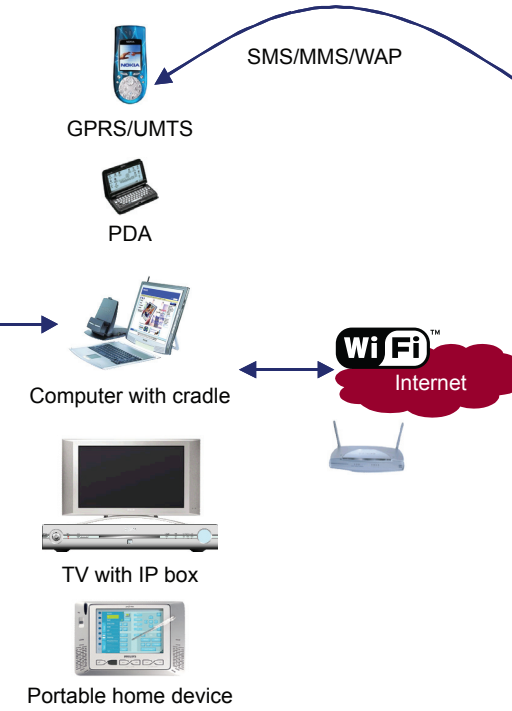
Key impacts of the NUADU approach include more cost-effective support for health – if you are moving more and get feedback or support, you will make less demands on your doctor or hospital services. In addition, there is a large potential business market as indicated by the number of products already being introduced by Europe's competitors.

A series of new product and service developments emerged, including:

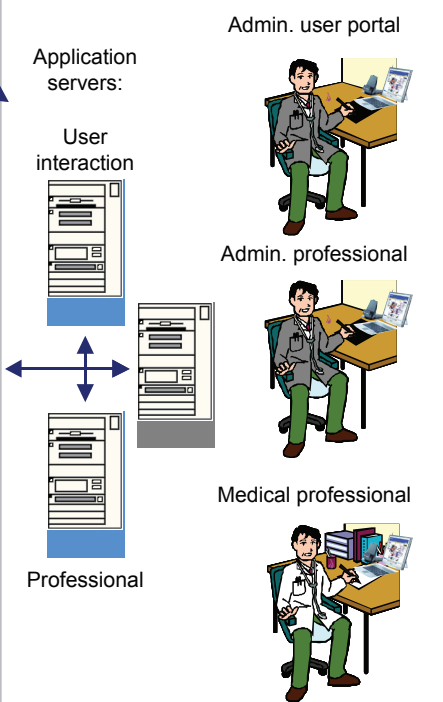
**Wearable, portable & stationary sensors**



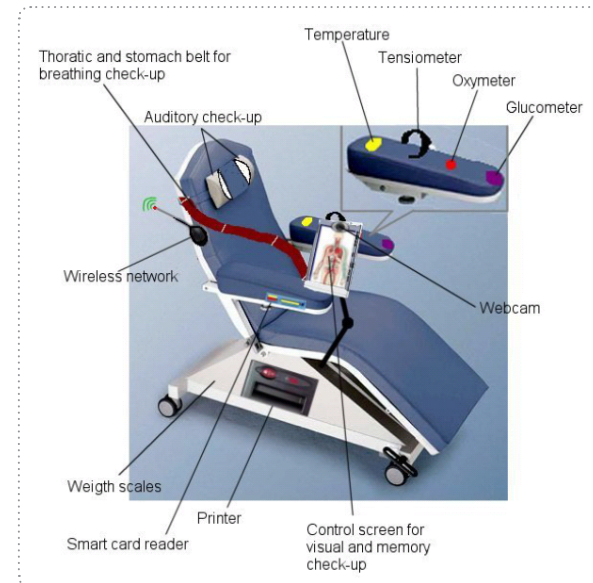
**Home & Away thin and fat clients**



**Backend Services Internet based**



- A tele-medical armchair enabling a series of non-invasive medical tests such as temperature, blood pressure, hearing, breathing performance and memory, suitable for retirement homes and hospitals as well as luxury hotels;
- A small wireless motion-sensor that measures how a person is moving and provides feedback against personal targets such as calorie use;
- Domestic stroke-rehabilitation services, where a stroke victim with a limp for example can have a personalised exercise programme with feedback; and
- A Wellness Diary service on a mobile platform.



**INCREASING SUPPORT COST EFFECTIVELY**

There is a large demand for NUADU applications in the healthcare sector where people are getting older and care centres are not well staffed. Tele-healthcare allows effective support with much less staff time involved.

Such an approach is particularly interesting for healthcare providers and could have a major impact on cost

reductions and quality of healthcare. Several studies point in this direction. A recent German hospital study concluded that by using tele-healthcare in a hospital environment, there is a significantly higher survival rate in chronic cases – 35% after 12 months and 20% after 20 months.

The major problem is the economic acceptance of the overall facilities. Healthcare insurance companies are showing interest; if they can really be convinced that it is going to save overall expenditure, they will be keen to invest. Patients themselves or their care providers might also be interested.

This has been one of the most uncertain outcomes of the project – it was possible to develop systems technically but who is going to pay for it (user, physician, insurance, government, ...) and who is liable in case of incidents (not clear since rules differ between various countries).

The project is now finished but there is follow up. For example, Philips and VTT have just started the InnoHub open innovation centre in Finland. This will allow them to work together on innovations in the tele-healthcare sector; it also involves a pilot site environment. And also other partners are ready to develop and market more new products based on the knowledge acquired in the project. For example, NUADU led to various promising spin-offs, like a start-up activity in Valencia and new ventures initiated by Philips. •