

How to avoid a false alarm when a patient just climbs the stairs



Dimitri Konstantas

How can health care be better and more cost effective? That was the political issue par excellence at the last general election in The Netherlands. The MobiHealth project, in which the CTIT participates as a scientific co-ordinator, can provide part of the answer. In a discussion, Master's degree student Katarzyna Wac and Professor Dimitri Konstantas, both closely involved in this international project, outline very exciting prospects.

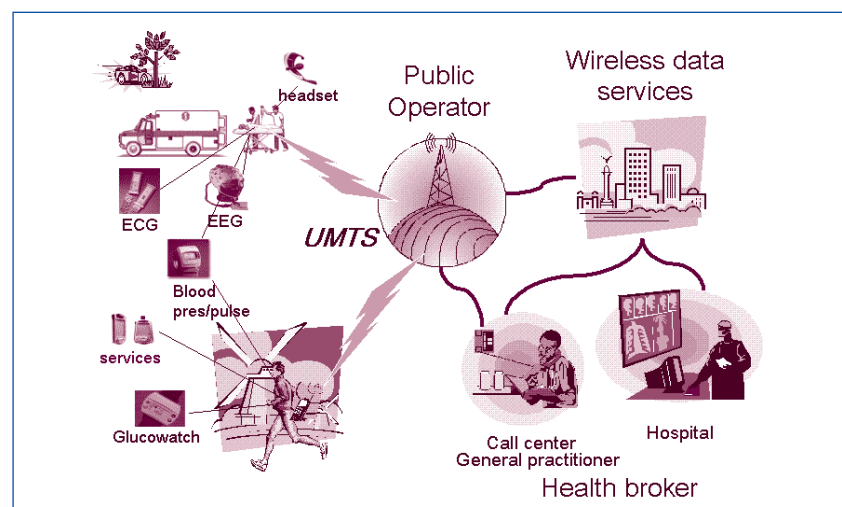
“Take chronic patients such as heart patients. At present, they must be constantly monitored, either in hospital or at home in bed or in a chair. This is, of course, not only very expensive, it's not a very pleasant existence for the patient either. With a Body Area Network (BAN), a network of wireless sensors and actuators fixed to the body, the ECG and the blood pressure can be monitored remotely at any time by a specialist in the hospital. This allows the specialist to take action when there are signs that a heart attack is imminent.”

“A second application of the BAN is for trauma care. A victim of an accident has the best chance of survival if the correct diagnosis is made and the right actions are taken within the first hour – the golden hour. If the paramedics can fit the patient with a BAN at the scene of the accident, this will immediately give the specialists in the hospital an idea of the situation.”

“The BAN must, of course, be very easy to use. You definitely cannot expect older people, in particular, to fit all sorts of sensors in the right way and in the right places. We are therefore thinking of sensors that look like a watch or a strap that are then fitted around the chest. In addition, the patient will have to carry a type of PDA (mini computer), equipped with wireless communication technology in order to connect to the Internet. In time, a mobile telephone will also be able to perform the same function.”

Examples of current projects:

- Mobile Health Care (MobiHealth)
- Electronic Patient Records
- E-health strategies





“We are now considering the possibilities for communication via GPRS and UMTS. Sending the sensor data alone requires 20 to 100 kbps. In the long term, we want to offer trauma care the possibility to send images, photos of victims or even short video films. This will require far greater bandwidth, I estimate about 250 kbps to 1 mbps. We also hope to fit built-in actuators, for administering medicines or for increasing the rhythm of a pacemaker. And we are also going to work on an expert system, a computer program that will assume the monitoring role of the specialist.”

“But that’s all in the future. Current problems include: how do you avoid all types of false alarms, for instance, if the patient drives into a tunnel and the connection is broken, or if the blood pressure rises simply because the patient is walking up the stairs? In other words, you will only be able to interpret the data properly when you know the patient’s actual situation.”

“Furthermore, it is difficult to assess an ECG over a two or three-month period instead of the usual one or two minutes. However, once a solution has been found, a completely new source of medical examination will be available. For instance, it is now often difficult to pinpoint the causes of an allergy as the effects of eating or drinking something are often felt only after a few days. But you might also be able to trace the cause of an epileptic fit or to gain a better understanding of the causes of cot deaths.”

“The MobiHealthproject is an initiative taken by CTIT employees Val Jones and Richard Bults about a year and a half ago and officially launched on 1 May. We have a budget of 8 million euro for a period of eighteen months. The funding has been supplied by the EU – 5 million euro – and the partners, including telecom companies such as the Swedish Telea and the Spanish Telefónica, the CMG software company and sensor builder Twente Medical Systems International. Ericsson-Germany are also involved and are responsible for the administrative co-ordination.”

“What will things be like in a year’s time? The first home care and trauma care trials will be launched, in order to demonstrate that this idea is feasible. Existing technology that can quickly be brought onto the market will be used in order to convince insurance companies and hospitals that this is practicable technology.”