i-med

Serious apps for mobile healthcare

In March 2010, KT-EQUAL hosted a day conference exploring the opportunities for mobile health that are offered by smartphone technologies. The event brought together the multidisciplinary expertise of healthcare professionals, industry representatives and academic researchers, to discuss openly the direction of pervasive mobile telehealth. The main messages to come out of the event were that traditional healthcare must evolve to integrate modern mobile technology, and that successful integration and application requires cross-sector collaboration.

With the average lifespan increasing, associated health-related issues are also on the increase. The KT-EQUAL programme, supported by the Engineering and Physical Sciences Research Council, provides opportunities for collaboration and research which aims to provide new treatment and rehabilitative technologies, thus improving quality of life for individuals who experience health conditions.

Thanks to recent developments in mobile phone technology, we now have access to phones with many of the characteristics of home computers, plus the advantages of mobility and compact size. Users can access the internet and other resources anywhere, and expand and tailor their phone's functions via the increasing market for downloadable applications, or 'apps'. A wide range of apps are available, from games to health and lifestyle, and these have become one of the leading incentives for consumers to purchase smartphones.

Although some health-related applications are available, most of these target general physical activity, and few have been developed in collaboration with the knowledge and expertise of healthcare professionals. As a result, available apps are frequently limited in their medical or therapeutic validity as well as in their breadth.

KT-EQUAL's i-med event was designed to provide an arena for healthcare professionals, industry and researchers to meet and discuss combined efforts toward the development of more effective and accessible healthcare aids through mobile and pervasive technologies.

Programme

i-med: Serious apps for mobile healthcare

Professor Christopher Eccleston, Director of the Centre for Pain Research, opened the event by outlining both the potential and the challenges of healthcare apps. Professor Eccleston confirmed the increasing issue of long-term health conditions and the need to exploring new avenues of treatment, such as those potentially provided by telehealth. He raised the role of technology in behavioural management of health, and specifically emphasised the features of synthesised intelligence and accurate data recall as important to achieving this.

Reviewing the current status of health-related mobile apps, there appears to be an exponential growth of the industry, targeting diverse conditions but frequently without the involvement of healthcare professionals in app development. Serious knowledge exchange across disciplines will be critical to the success of new mobile and pervasive healthcare apps, to direct development away from the 'trivial' toward the 'serious'.

Remote Carer mobile application

Justin Paul, Head of Marketing Development for Airwave, described Community Carer – a mobile PDA device for patient data transfer, work scheduling, and review. Community Carer has been trialled by 200 district nurses and health visitors, and has reportedly helped reduce administration time through accessible electronic patient details and case notes, and an appointment scheduling system. Because the device is simple and easily carried, health professionals are able to spend more time with patients.

Justin emphasised that the development of a common language is key to developing successful mobile aids for healthcare professionals, to bridge the gap between their actual needs and what technical developers perceive as their needs.

Selected R&D memes

Technology is a fast-paced industry characterised by constant development. **Graham Fisher**, former Managing Director of France Telecom R&D UK and founder of independent telecoms and innovation consultancy BathCube, considered the competitive and time-specific nature of this sector and how it relates to healthcare. How successfully a technological idea is converted to reality is not only dependent on the quality of the idea, but also the time when it is launched. Review strategies increase the chances of the new device being successful in the market; other important factors are persistence and an awareness of the economic climate.

In recent years, a range of mobile health aids has been developed, from simple medication monitors and text-message appointment reminders to smartphones capable of taking ECG readings. Graham stressed the importance of uniting advancements in sensor devices (such as the bio-monitor plaster) and data connectivity between monitors. He acknowledged ethical issues relating to privacy and security, and the need not to intrude into the patient's life; but his overall message was that mobile telehealth can help to empower patients.

Telehealth in practice: challenges and opportunities

Dave Tyas has direct experience in developing and evaluating telehealth technology for the NHS. He leads the Whole System Demonstrator programme, a trial of assistive technology for 6000 patients with long-term health conditions. The trial is the largest of its kind in history and details the life-changing effects of technology in giving patients the skills to better manage their condition.

Patients' possible reluctance or fear towards adopting telehealth aids was a commonly-voiced concern. Dave reported that, in the NHS trials, this concern was hugely reduced once the patient was actually introduced to the technology. He argued that the challenges of designing and implementing successful mobile telehealth are less about patients rejecting technology, and more about the need for the NHS to make some 'brave' decisions.

The ongoing success of the trials confirmed that simple mobile intervention can empower patients and help with their self-management. In turn, this relieves some demand on healthcare professionals, allowing them to spend more time with patients.

Machine-to-machine for healthcare?

The final talk of the day was led by **Guy Summers** on behalf of Vodafone Group. Guy has expertise in machine-to-machine communications, and he considered their application to healthcare.

The talk imagined a future infrastructure of networked sensors and machines capable of transferring information between each other. Such an infrastructure could monitor and communicate patients' conditions, behaviour, and records in real time, relaying information to healthcare professionals at the moment it is needed. Standardisation of software and hardware technologies such as sensors would be critical to developing this kind of infrastructure.

Warnings were raised about previous complications that industry has faced when developing for the healthcare field. A well-informed business model and strategy would be critical to entice industry into collaboration, and a service-based model rather than capital investment model was proposed.

What the event demonstrated

The keen attendance and involvement in the event from representatives of the three sectors (health, industry, and academia) demonstrated the considerable interest that all fields have in developing mobile solutions for healthcare. The concerns raised by many as to the increasing demand and unsustainable traditional healthcare model revealed this discussion to be timely indeed. The following issues were raised:

- Long-term health conditions associated with older age will continue to grow. The traditional model of acute treatment cannot meet demand. New solutions are needed to increase accessibility, empower the patient with the skills and apparatus to self-manage, and facilitate healthcare professionals in treatment – and these solutions must also be economic.

- Developments in communication technology illustrate a potential infrastructure for real-time communication and information access for both patients and professionals. At present, applications in this field are limited. There is a need for 'brave' decisions to be taken, moving away from the 'trivial' towards the 'serious'. This move will require multidisciplinary investment and collaboration.

- Industry representatives maintained the importance of defining a clear business model illustrating payment plans.

- Simplicity and convenience were frequently voiced as key characteristics likely to improve the success of telehealth aids.

- Social networking was emphasised as a frequently-used tool for attracting and retaining users of computer games and websites. Delegates discussed the potential for using a similar tool in mobile healthcare for long-term discussions.

- Games offer an engagement benefit. Delegates discussed this in relation to the field of 'serious games', such as apps which use games for healthcare, military and industrial purposes.

- The pathways for industry and academic proposition with the NHS are not always considered clear. The multi-regional structure of the NHS was discussed and it was advised that preliminary research and data to support and large scale research proposition (such as the Whole System Demonstrator programme) would clarify benefits over risk of NHS investment.