Impact Case Study

UoA 11: Computer Science and Informatics

<u>**A new mobile-based reminding product for connected health**</u>

Findings from recent research studies show that 91% of adults aged between 57 and 85 consume at least one item of medication daily, and that around 76% of prescribed medications are taken incorrectly, and 29% are not taken at all. When not adhered to correctly, medicated treatment can be ineffective, wasting both money and the valuable time of doctors and healthcare professionals. Forgetfulness is the most commonly reported reason for people not taking their medication properly.

The Computer Science Research Institute (CSRI) at Ulster has tackled this problem by developing an internet-based care model that helps patients, pharmacists, carers and GPs to dynamically manage the prescription of medication for patients and that also helps patients to comply with taking their medication in the prescribed way and at the right times. This care model has been incorporated into a service platform produced by an international telecare company that provides products and services for the healthcare market. This research has extended the functionality of the company's product, which is now being used by over 400 patients in Europe. By using the product, patients are managing improved levels of medication compliance, caregivers are finding that their burden is reduced, and healthcare professionals are experiencing improvements in the management of their workflow. The product also now incorporates reminders for patients and carers that are delivered as short video clips, and this extension to the product has enabled CSRI to set up formal collaboration agreements with the company to further extend the usefulness of the product for patients and carers in the future.

CSRI has been working on developing technologies for managing medication for over 15 years, and particularly to support people with dementia. The work originated though a project called MEDICATE, which started in the year 2000 with funding from the European Union's Framework Programme 5. The research developed an Internet-based care model to support all stakeholders in the supply to intake chain of personal medication management. The approach was very effective, with two-thirds of users showing improved compliance with taking their prescribed medication, and a reduction in the average contact time that was needed every week by caregivers.

The MEDICATE solution was extended to a mobile-based reminding application, which inspired the concept of video-based reminders for persons with dementia. A video-based reminding system that uses everyday mobile phone technologies was developed. The system was tested extensively with cohorts of elderly users, persons with dementia and control groups, along with their carers; in total, over 400 days' worth of evaluations were conducted between 2006 and 2012.

Following these evaluations, analysis provided insights into the most appropriate ways to use video-based messages for medication reminders and how user interaction with the technology should be designed for people with dementia. The analysis also identified an additional key challenge: assessing the factors that influence whether patients and carers will adopt the new technologies, and then using that knowledge to improve the rate of technology adoption.

Since incorporating the new functionality into its product in 2008, the company has reported securing new contracts for the product, with substantial new revenue; creating additional new posts for research and development engineers to further develop the product; and use of the system by over 400 users. A joint commercial venture between CSRI and the company was established in November 2012, with the aim to provide support for the product within the UK, from both marketing and installation perspectives, and to promote the further uptake of the product within Europe. From a healthcare perspective, General Practitioners have reported the positive benefits of being able to monitor patients remotely using the system without the need for home-based visits. In addition, patients have provided positive feedback about how the system gives them a solution that offers constant monitoring and communication with a doctor.