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TETRACOM D3.34: FER Home Health Smart TV Integration in eHealth clients (FHTV)

Mario Kovač, Hrvoje Mlinarić, Igor Piljić, Leon Dragić (Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia), Branko Šoštarić, Vedran Grčić (MCS Grupa d.o.o, Zagreb, Croatia)

The analysis presented in [1,2] shows that public health expenditure in the EU's 27 Member States was on average 5.9% of GDP in 1990, rose to 7.2% of GDP in 2010, and the projections show that expenditure may continue to grow to 8.5% of GDP in 2060 due to the ageing population and other socio-economic and cultural factors. In addition, the long term care expenditure projection would on average almost double over the projection period. Similar analysis [3] showed that US health care costs doubled in a 30-year period and were forecast to reach 20 percent of GDP by 2017. At the time, more than 75% of health costs were being consumed by chronic care management, and health economists forecast steady increases of almost 7% per year in national health costs. Thus digital health frameworks are considered to be one of the top priorities for all governments and health systems.

Despite the economic crisis, the market potential of digital health is strong. The global telemedicine market reached $13.8 billion in 2012, is expected to grow to $35.1 billion in 2018 [3]. The convergence between wireless communication technologies and healthcare devices and between health and social care is creating new businesses where connectivity is the key enabler [4].

Digital health can benefit citizens, patients, health and care professionals but also health organizations and public authorities. The Health Online 2013 study [5] shows that seven in ten (69%) U.S. adults track a health indicator for themselves or a loved one, where 21% say they use some form of technology to track their health data, and many say this activity has changed their overall approach to health.

The problem that arises with digital health is inability to target the population that uses health services the most – elder people. Because of the different barriers such as inability to use computers or mobile devices, physical disabilities or IT illiteracy, elder population is unable to use current solutions such as patient portals or mobile applications provided in today's e-health solutions.

In this TTP we have focused on improving existing product offered by Partner Company MCS Group Ltd using technology developed on Faculty of Electrical Engineering and Computing. MCS Group Ltd has been the leading Croatian manufacturer of information systems in health care. Over the recent years, MCS Group has focused a large part of its development on new knowledge in the area of creating complex Cloud solutions, primarily as integral solutions for healthcare and related fields, and in the construction of the system of electronic appointment booking, advanced data analyses and use of programs through smartphone or tablet devices (mMedicus.Net). The benefits for MCS Group Ltd. of this TTP were user penetration and increased company visibility which lead to attracting new key customers (potential investors from health/telecom market segments).

Researchers at the Faculty of electrical engineering and computing (FER) have developed FER Home Health Smart TV solution that is integrated solution for easier access to medical data for elderly citizens through Internet connected TV's. The rationale behind this is based on the studies that demonstrate that elderly people are significantly more acceptable to view and control their health related information using TV then using high tech, novel small screen mobile devices that are too complex and/or too small for most of them to use. Therefore, both user penetration and business results would be much higher and benefits to both patients and health care system would be significant. The technology and the application were already developed and tested, and the cost of the introduction of the system to commercial exploitation was reasonably small which enabled good business case scenarios.
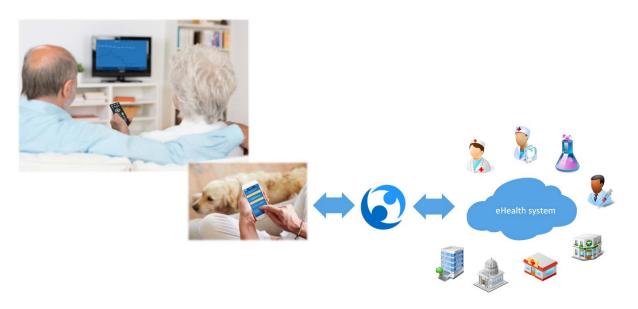
Figure 1. - Integrated solution in e-health environment

For this TTP, newly introduced Health.Net platform by the MCS Group Ltd has been chosen for integration with FER Home Health Smart TV. Health.net is a novel system that helps and enables patients to actively participate in their healthcare. Even though this modern system has numerous features, it was limited to the message communication and was runnable only on modern mobile devices and computers. In this TTP these limitations were removed by introducing technology developed on FER which increases usability, efficiency and portability of the system itself.

The goal of TTP was to integrate Home Health Smart TV with Health.net system. Home Health Smart TV offers possibility of video communication between users which was recognized as excellent improvement over current message communication offered by Health.net. The integration would also enable running Health.net on TV devices with specially designed interface.

First step towards this integration was identifying primary datasets that are used in integrated solution. The datasets were acquired from previous pilot projects and as a result of discussion with medical experts. Because of the data sensitivity used in e-health systems, security was a big concern throughout the duration of the project. The integration of Home Health Smart TV didn't affect the security level of the system itself. After the plans for the integration have been made, the design process has started. Big chunk of time period of this TTP was invested in adaptation of the existing interface of Health.net system to Home Health Smart TV. It was necessary to transform existing objects on the layout to focusable objects that could be selected using remote control which is a primary input unit for TV's. After adapting the interface it was necessary to introduce video communication and adapt it to the existing design. In the next phase, thorough testing of the system took place. After fixing the issues encountered in testing phase, the showcase demo design was created. The demo was widely presented and received a lot of positive and useful feedbacks. With the showcase demo, prototype for pilot project was developed. The system was piloted in two separate pilot projects. The first pilot encompassed 40 patients: 20 from the control group and 20 from the operational, while the second pilot included smaller number of patients but included medical staff as well. The number of the users was limited with the number of available Home Health Smart TV devices. While the pilot project is still in progress, in the TTP phase, FER has successfully integrated the Home Health Smart TV with the solution of MCS Group Ltd - Health.net. The information collected from the pilot project will steer the future development and improvement of the integrated solution.

[1]   EC, „eHealth Action Plan 2012-2020 - Innovative healthcare for the 21st century", 2012,

[2]   EC, Economic Policy Committee, „2012 Ageing Report: Economic and budgetary projections for the 27 EU Member States (2010-2060)",

[3]   BCC Research, „Global Markets for Telemedicine Technologies", October 2013,

[4]   EC, „GREEN PAPER on mobile Health ("mHealth") ", 10.0.2014.,

[5]   Pew Internet and American Life Project, 2013,