INDEPENDENT: Technology supported autonomous living

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Abstract. ICT enabled Service Integration for Independent Living (INDEPENDENT) is an ICT – PSP project funded under objective 1.3 ICT for ageing well / independent living. Work has started as early as February 2010 and expected to finish after 3 years. INDIPENDENT will address current limitations of telehealth and telecare platforms to serve needs for support and delivery of support to the elderly which is not limited to a single sector (healthcare or social care) but spans the two sectors and empowers informal carers and the third sector to participate in delivery of support. This paper will discuss the Greek experience when drafting pilot scenarios that fit into the project's goals.

Keywords: elderly, social care, health care, autonomous living, third sector, integrated platform of communication, informal carer

1 Introduction

Large demographic changes are underway in the EU which will lead to significant increases in old age dependency ratios. Ageing and health care along with long-term care expenditures appear to be highly related. Ageing populations pose major economic, budgetary and social challenges. By 2060, projections agreed within the Member States set the increase in age-related expenditure at an average of 4¾ percentage points (pp) of GDP inside the EU. At the same period Europe will move from having four people of working age for every person aged over 65 to a ratio of 2 to 1. Ageing will already start affecting most EU economies in the coming decade. According to Eurostat, Europe is an ageing continent. Statistics say that [1]:

- The size of the EU population will fall from 376 million in 2000 to 364 million in 2050. Big declines will take place in Italy, Spain and Germany whereas increases are projected in France, Ireland, Luxembourg and the UK;
- The number of young persons (aged between 0 and 14) will fall from 69 million in 2000 to 58 million in 2050
- The working-age population (aged between 15 and 64) will fall by some 20%, from 246 million in 2000 to 203 million in 2050
- The numbers of elderly persons (aged 65 and over) will rise significantly from 61 million in 2000 to 103 million in 2050.
- Within the 60+ age group, there will also be a significant growth in the number of "very old", i.e. people aged 80 years and over. Whereas the very old constitute 3% of the European population today, 11 of the former EU-15

Member States will have at least 10% of their population aged 80 or over by 2050.

Eurostat also predicts that by 2060 almost a third of the population of the present EU countries will be aged over 65. The current proportion is one in six. The population aged above 65 as percentage of the population aged 15 to 64 is shown in Figure 1:

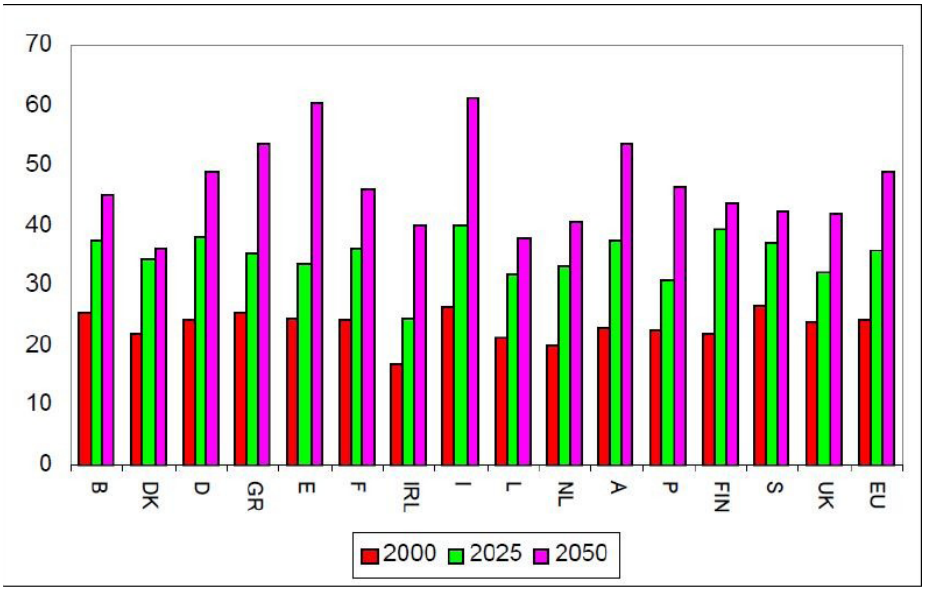

Figure 1: Old Age Dependency Ratio in EU member states 2000, 2050[2]

The main reasons behind the trend are:

- Increased life expectancy
- Low birth rate
- "Modernization" of lifestyles
- The growing ability of medicine to intervene and keep alive people who previously would have died
- Much higher proportion of the population living with chronic conditions and, in many cases, multiple conditions.

In Europe, all national care systems are faced with three major challenges, as the population of Europe is ageing, health care is increasingly effective but also becoming more expensive, and patients, having become true consumers, are also more demanding. Expenditures in the global market for telemedicine are expected to grow at an annual rate of 19% till 2012, from 4.7 Billion in 2007 to 11.2 Billion in 2012[3].

2 A Criticism on Support Mechanisms

As Europe's population ages, the way we support older people will have to change. The National Health Systems as well as the individuals cannot afford to have the elderly being looked after in institutional care as it is widely done today, nor even our older people want to lose their independence in this way. Healthcare and social care to older people at home is growing in importance, and care service provision is empowered and improved by ICT-enabled solutions, by modern telecare and telehealth systems. However, for a number of reasons these systems are not adapted to the needs of the elderly and consequently to our needs as we grow older.

So far we have designed ICT-enabled forms of support as an embedded integral part of healthcare and social care organisational "silos" hence living unexploited the great potential of solutions such as telecare and telehealth. Up until quite recently, national welfare and health systems and regional/local support practices were developed in a highly specialized way and boundaries between them were well defined preventing them from cooperation [4].

However, when it comes to supporting older people living in the community, today's reality is still characterised by fragmentation and bureaucracy in current provision systems resulting in disjointed and patchy support services. Recently the dangers of closed silo service provision have been widely recognised at the policy level and steps taken to spread responsibility more widely and introduce cooperative structures, including third sector and citizens groups. Many governments are now beginning to seek to improve collaborative support of older people living in the community. Evidence points into the direction that "models of integrated health and social care for the elderly can result in improved outcomes, client satisfaction and/or cost savings"[5]. ICT suppliers have not yet properly responded to this trend.

The design of today's components for telehealth and telecare reflects their customers' specialisation in separate sectoral "silos" respectively for healthcare provision and social care provision. This has restrained them from the wide scope cooperative approach now increasingly seen as essential, and restricted them in particular to integration of responsibilities and tasks performed by family or volunteers usually called the third sector. Current platforms for vital signs monitoring provided by healthcare organisations are generally not accessible for care personnel outside the directly responsible health institution. While first generation systems provided only capture and transmission of vital signs, the current generation of such platforms is beginning to support interaction with the cared for individual, but typically communication is restricted to those having access to the vital signs server in the clinic. Apart from this, state-of-the-art platforms for chronic disease management are currently designed for use only within the healthcare sector, though the care tasks including training and measurement or quality triage can better (more cost-effectively) be provided outside the periphery of the formal health care sector.

ICT platform for social care, primarily social alarm or more generally telecare, are somewhat more open to the transfer of information from the cared-for person to the family and other informal or voluntary carers. Currently, this openness is mainly limited to sending alerts and messages outside the system. These home platforms, in the inward direction, are exclusively accessible from professionals working in the sector though outward communication from the home is available to

some extent. Platforms provided for social alarms by community alarm providers are not in any way fully accessible to care personnel outside the alarm centre directly responsible.

Existing and additional functionality – messaging, reminders, questionnaires etc. - could be used more effectively if controlled and secure access were given to informal carers and other authorised support givers outside the specific service provider organisation operating the platform.

In addition to opening up current telehealth and telecare solutions and providing functionality on unspecialized platforms, the organisations and individuals, supporting the elderly need tools to effectively cooperate with eachother. Back office inter-organisational services in support of collaboration have also largely remained yet unrealised.

Some progress has been made to removing an emerging telehealth island within healthcare, e.g. Philips has implemented the Continua xHR standard to connect telehealth systems with existing electronic health record (EHR) systems. Shared usage of ICT infrastructures across established domain boundaries to support cross-sectoral collaboration, e.g. by medical and social professionals, though intra-sector integration is being tackled in this way, is nowhere near reality in neither Europe nor elsewhere [5].

Together all these factors contribute to the fact that the vast potential that innovative ICT solutions do generally hold for supporting older people in living independently in the community has yet remained largely unexploited, with negative impacts on the quality of life of those whose independence is threatened by social and other circumstances that tend to appear when growing older. Additionally, this situation has negative impact on the economic sustainability of welfare and health systems. It is widely recognised that models of formal support provisioning to the elderly need to change, to reflect the budgetary pressure and the demographic changes, including different ways of accessing formal carers and co-ordination of informal care. This creates obvious needs for integrated means of communication and for the supporting technology. It also highlights the potential for familiar user and home technology performing a role within the supporting network.

3 Mission and Objectives of the INDEPENDENT project

Therefore,

- given that in the ageing societies of Europe and elsewhere the pressure is increasing to improve and extend support to independent living of older people, and
- given that a purely sectoral professional approach in healthcare and social care will fail to deliver and it is recognised that working collaboration and task sharing must be established between professional healthcare and social care services, informal and family support and voluntary sector organisations, and
- given that extension and interoperable opening of today's sectoral ICT solutions and replication of functions and interoperability onto low cost

consumer devices provides an opportunity to make this collaborative cross-sector load sharing affordable and bearable;

The mission of the INDEPENDENT project is to define, deliver and pilot a multiplatform digital infrastructure supporting coordinated cross-sector delivery of sufficient and timely support, thereby effectively preventing or at least slowing the way many older people today inexorably slip towards the edges of safe independent living.

In line with this mission the project will pursue a dedicated programme of service process innovation complemented by adaptation of technology. Digital support infrastructure and related services will be set up and piloted:

- using appropriate existing technology to provide as many older people as possible with digital access to the support services they need and enabling them to be reached appropriately by digital techniques by those who can support them and
- augmenting and opening sectoral platforms to enable coordinated cross-sector support delivery,
- developing of care coordination applications to run on informal care platforms, such as scheduling, automatic messaging, voice and video telephony support,
- adopting a clearly demand-driven, choice-giving approach and avoiding all technology 'push'.

4 Mature starting points in Trikala, implemented by Vidavo S.A.

In services currently used by 298 users, elderly people are equipped with light-weight handheld devices and record their vital signs which are then transferred (via the telecare center) to the municipality hospital over PSTN or GPRS for review and feedback by the experts. This combines the components of self-care health service, professional health service, and vital signs remote monitoring. Teams of nurses and physicians visit the older people at home. The nurse records their vital signs and forwards them to the hospital (via the telecare center) for review and feedback by the experts. This combines the components of professional health service, and vital signs monitoring.

The solution complies with a variety of standards as well as promotes and safeguards present and future interoperability with other systems. For this reason:

- The development of the platform was based on open source technologies, and only where required utilisation of proprietary systems took place
- For the interconnection amongst systems, and for future interconnection with HIS, the HL7 protocol is utilised
- For the wireless transmission of the various data, established protocols and technologies are utilised such as the Bluetooth technology for the short range communication between devices.
- The eHealth Interoperability Standards mandate (M403) is followed closely.

A schematic representation of the platform is shown in Figure 2:

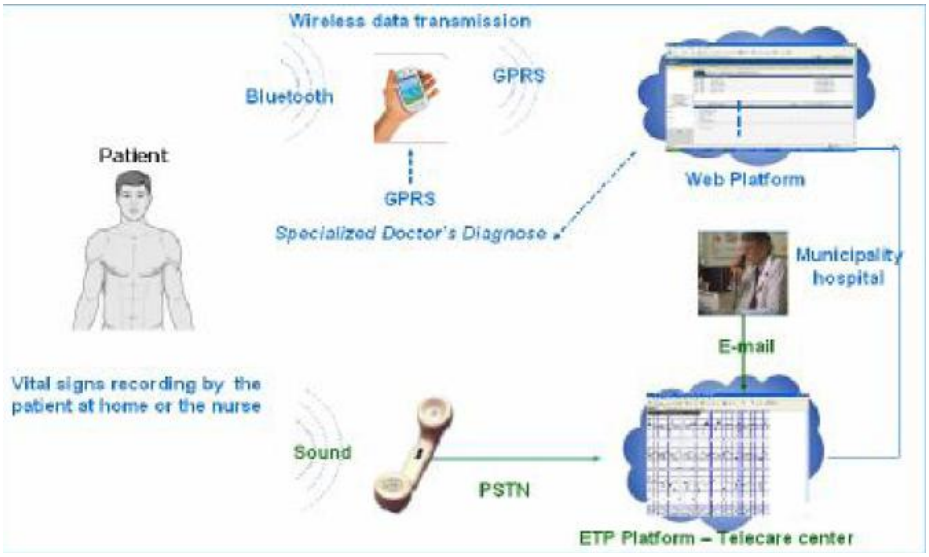

Figure 2: Trikala's already installed platform

The health status monitoring offered is based on the electronic health record (EHR) of the elderly who participate in the scheme. The existing EHR consists mainly of medical components such as latest diagnostics, prescriptions, ECGs, etc. with no reference to the individual's mental health status. Some demographic data are also included for facilitating the EHR administration. So far access to the EHR is only allowed to physicians from both the General Hospital of Trikala as well as from Sotiria Hospital in Athens acting as the centre of excellence for the chronic syndromes from which the majority of the elderly suffers. Communication between the health care practitioners (regardless of specialty) and the social services of the Trikala Municipality has retained its traditional paper or oral format.

5 The solution envisaged for Trikala in the context of INDEPENDENT

The Municipality of Trikala, with the aid of VIDAVO S.A. through INDEPENDENT project plans to develop:

- An integrated platform, for common use from the care and health services, with the use of ICT, based on an extended health and care multilevel records and enables cross-sectoral access in particular to augment support to users of remote health monitoring systems.
- study and make the necessary organisational re-formulation of the existing care and health services, on the basis of the integrated platform of INDEPENDENT
- tele-videoconference for psychological support

- Create a single point entry for the elderly to the health and care services of the Municipality that will cut across organizational boundaries of the various present service models.
- provide efficient integrated care to provide communication and exchange of data between the social and health services by sharing common information resources and by providing to them new tools to support the process of care of the elderly at home
- Increase the users or the care and telehealh services by reducing complexity, overlaps of care provision and repetition which decrease efficiency.

In order to better combat depression as a medical cum social condition there is a need for enhancing the monitoring of the individual's status by including psychometric characteristics. The same principle applies to EHRs, they should also be upgraded to incorporate psychiatric diagnostics, prescriptions, free text from consultation, treating practitioners comments etc. The enhanced EHR should not be limited to the medical practitioners; social workers who play a very important role in the community should also interact with this ICT tool. Their shared locus of operation is the elderly and the new tools provide the means for uninterrupted and efficient communication between the two categories of professionals thus allowing for continuity of the overall health care. Informal carers or the elderly could also have access to the EHR in an effort to create awareness for specific conditions and in some cases to reassure someone on his/her actual health status.

In terms of procedure an alarm system could be generated that every time there is a new insertion from either group (social or medical) the others will receive an e-mail prompting them to access the file so they can be updated on the newest developments on the elderly monitoring. This change in process will impose the principal of non repudiation for the practitioners and it will also ensure through the historic data stored in the EHR that even professionals who have never worked with the individuals before, they will have access to all the necessary information for continuing offering their services in the most efficient way.

The services will also strengthen the daily interaction with their social sphere - partners and caregivers, giving them the feeling of safety and preventing their social isolation.

This set of services will be integrated. This set of services will be integrated in the scope of the project, evaluated and tested in realistic conditions with real users. The integration will be performed on already existing hardware facilities providing thus the end-product service for the users involved.

This necessitates the holistic approach that will be followed in the project and that will involve the broad expertise and role of the participating partners, and the continuous convergence of the individual components to the service on the integrated platform.

6 Conclusions

The difficult changes that many elderly individuals face—such as the death of a spouse or medical problems—can lead to mental ailments such as depression, especially in those without a strong support system. Left alone, it does not only prevent older adults from enjoying life like they could be, it also takes a heavy toll on health. Although depression in the elderly is a common problem, only a small percentage gets the help they need because the condition is so often overlooked. The consequences of this oversight are high. Untreated depression poses serious risks for older adults, including illness, alcohol and prescription drug abuse, a higher mortality rate, and even suicide. For the condition's treatment the close cooperation between social services, informal carers and mental health professionals is considered mandatory.

In the context of the INTEPENDENT project, the Municipality of Trikala along with VIDAVO S.A. as technology provider will attempt through an ICT empowered solution to integrate health and social care services into one powerful platform that will allow its elderly users to prolong their autonomous living in their familiar surroundings.

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