Suggestions for the Elicitation of Seniors Involvement in ICT and Socially Innovative Solutions to Tackle IT

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Abstract: Human-computer interaction (HCI) issues for older people are extremely important in the light of the rapidly ageing population in developed countries. In addition, technology offers great potential for this age group, but it will be only useful if it can be used effectively by its target users. We will therefore examine how HCI can address the needs and situations of this increasing older population and how their involvement can be maximized in order to support participation and empowerment. In recent years, HCI technologies have manifested their potential to enhance the autonomy and quality of the life of elderly people, through boosting the elicitation of seniors. This paper is describing a methodology and challenges that will support healthcare professionals' action in the further effective usage of systems based on HCI.

1 INTRODUCTION

Innovations in human-computer interaction research have revealed effective methods for people with various disabilities to use computers or to receive computer-aided medical treatment (Hendrick, Schooley & Gao 2013).

Since the inception of medical computing three decades ago there has been an extensive discussion of the value of developing an interactive computer-based clinical record system for the practitioner, not only to provide routine decision support for patient care, but for the capture of both contemporaneous and longitudinal data important to clinical epidemiology, quality assurance, risk management, and the development of increasing varieties of experiential based reasoning. The goal of regular clinical use requires to put the user in focus or – as HCI (human-computer interaction (HCI) researchers would call it – to adopt a user-centered design approach (Norman, Draper 1986). This is not what already has been implemented and is our recommendation.

Human-computer interaction testing is being commonly used in many commercial settings to form better human computer interface scenarios (Gosbee, Ritchie 2007). The users of HCI are both patients and medical professionals. This means the HCI testing needs to include both types of users. Patients come with all levels of background and experience in technology. Medical professionals are naturally very patient-focused and not necessarily focused on medical devices. We suggest that HCI testing needs to meet the needs of all potential users.

Nevertheless, there has been a growing attention to the development of more powerful social methodologies, identifying barriers and focusing on challenges with new interaction modalities. It is also crucial for these methodologies to address the issue of participation and empowerment. Since WHO Global Strategy for Health for All by the year 2000 (1981) these categories have been of high importance in improving health and still remaining a challenging one. This paper is describing a methodology and challenges that will support healthcare professionals'

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action in further effective usage of systems based on HCI.

2 PROBLEM DEFINITION

As people get older they will also want to remain active in ways previous generations did not. They will want to continue to be a part of the workplace, to drive and travel the world. Seniors in 15-years´time will expect and demand from suppliers to be able to use new technologies as they appear on the market. Seniors will want to use computer technology to stay connected to society, work colleagues, friends and children. They will want them to support their health and well-being. And as they get older, friends and family may want computers to keep an eye on their aging family members. There will be an increasing number of social communities, where people will be able to upload their personal health data or send photos of what they have eaten and a log of their activities to online doctors who will be able to give them up-to-date and personalized assessments. Medical records of physical and psychological health may also become resources for new ways of sharing and documenting the medical problems of older life, allowing for more customized and reassuring health care.

The last 15 years and the era of smartphones and IP-based devices have seen not only an enormous growth in the number of devices, but also an almost explosive diversification in the nature of these devices, operating systems and terminals as they have entered every aspect of our lives. In this paper, we face senior population where they will need to live with an ever growing and dynamic set of interconnected digital devices. End- user interfaces will be close to seniors and even attached to them, while others will be invisibly built into their private ecosystem (home, senior house).

Design recommendations for senior-targeted technologies or rendering more elderly-friendly common technologies have been common in the literature on aging and technology (Discipulus Project, May 2013). Changes particularly in the cognitive, sensory and psychomotor functioning of adults as they grow older mean that the elderly often require interfaces that correspond their specific needs. What are the key technological setup guidelines for designing a computer system for senior users?

The reason can be discussed from two different points of view. The first is their age-related problems; the physical and mental decline make it hard to adapt to new products. Another perspective is a software logical and interface design; software architects do not take into account older users' characteristics and personalization. For a more specific group of users such as seniors, it is necessary to find out wider and deeper design parameters, which should be a more specific and enchanted version of technological guidelines.

3 SUGGESTIONS

3.1 Seniors as users and co – designers of ICT based e-health solutions

Most often the innovative business processes in health care results in shortening the healing process through the support areas. This support is mainly based on effective self-management and integrated IT systems. Such innovation systems can also include the implementation of telemedicine Innovations (Fig 1). These methods rely on the analysis of business processes and organizational structure in terms of increasing the efficiency of the care organization. There are many processes for improving the patient care with the possibility to increase efficiency in health care. In this group integrated care pathways are a typical patient-centric approach to the care of frail people realized by CareWell Project . It is an innovative approach and consists of a platform supporting information and communication needs of the patient. Every service to be active should also be gathered from the relevant experts. It supports what needs to be in place for legal, technical, organizational and financial requirements as well as the different needs of patients and healthcare professionals whilst taking into account elements that may bias them, such as their current access attitude and knowledge of ICT. It is also important how they perceive the impact the service will have on them and what they expect to be the service's advantages and disadvantages.

A new vision of elderly care is based on the patient's focusing and on high-quality equitable health care for all patients in the Europe. Providing a strong and integrated service for senior patients in the area of health, social inclusion and life and personal fulfillment is possible through the use of e-health solutions.

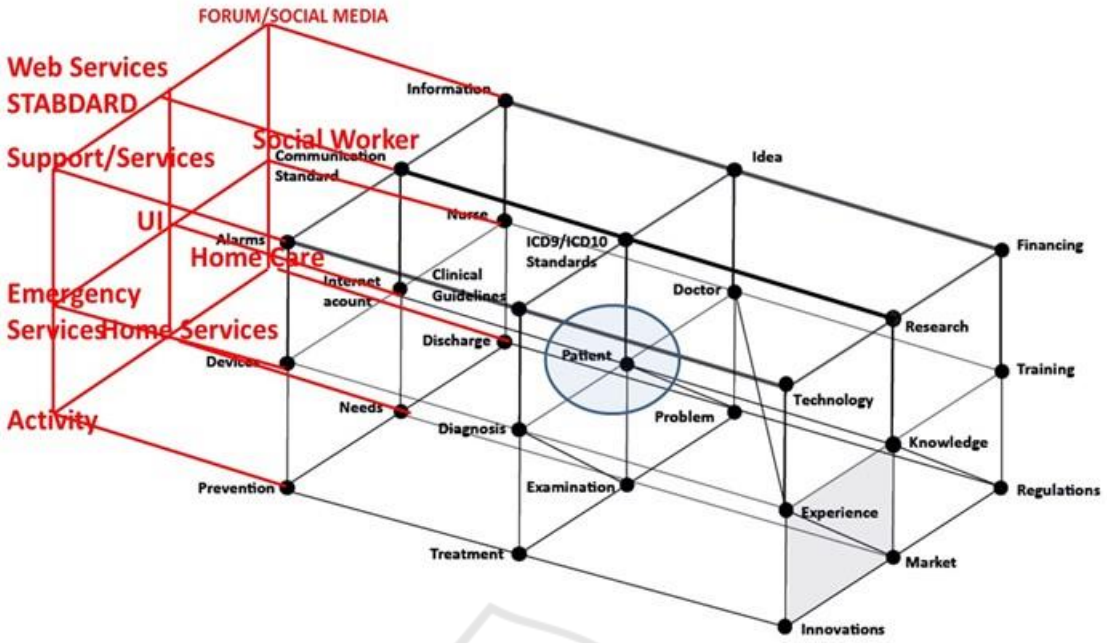

Fig 1. Graphical representation of health care system

According to the EU health policy priorities in the field of e-health it is necessary to put the patient into the center of attention and activity. The main risk factors and efforts in empowering seniors activity are based on the acceptance by patients and doctor relationship (with an emphasis on understanding and trust). Patient empowerment should focus on social responsibility to take into account long-term costs of telemedicine (after pilot stage the costs will be shifted to the patients), and the risk that non-users of Telehealth will have some serious reservations about the lack of face-to-face contacts. Telecare in the future should fully replace "conventional health care". For the effective implementation of TeleHealth it is necessary to consider more barriers on the side of technology than patients. Another influence of Telecare, which should be considered, is based on patient safety in communications with healthcare professionals. This is why many of EU projects, such as CareWell project, are focused on the impact of e-health solutions concerning the safety of the patient. Based on the CareWell experience it is very important to design networking with other key stakeholders at the EU level to put the patient at the center of attention. In accordance with the principles of equality, prevention is the process by which people can gain greater control over decisions and actions affecting their health (WHO 1998). These key issues in CareWell Projet were mainly based on collaboration, networking, and mutual talks according to the knowledge and expertise of patients, resources and styles of action. Now, patients should be able to plan what to do next, how to go forward and how to build their own solutions to health issues. There is a need to develop initiatives and educational interventions (Cooper et al. 2011) which utilize the principles of adult education who wish to have influence on the feelings, thoughts and behaviour. According to this, it is necessary to use teaching strategies to enable patients to make choices, so that they can transform their knowledge into practice. Therefore, theoretical models of behavior should be incorporated into models of education. Interventions should be designed taking into account the expected effects such as quality of life, personal models of the disease and the empowerment regardless of physical conditions and in accordance with the instructions of self-care. For the entire patient support process and education, it is important that the patient is able to evaluate the quality of life. Therefore, questionnaires about the quality of life (QoL or QOL) will be filled-in as a part of patients enrollment in the CareWell project. Furthermore, the emphasis is put on the importance of questionnaires, which generally relate to the quality of everyday life of the individual, or they asses their well-being (Table 1). This includes all emotional, social and physical aspects of life of an individual in connection with health. In healthcare the quality of life and its assessment is very important. However, every person may be limited in time

through an illness or a disability. In this way it can influence the interface of the IT system.

Table 1: List of existing questionnaires.

Questionaire	Description
PIRU	Questionnaire on user experience of Integrated Care
GDS	Geriatric Depression Scale
Barthel Index	Barthel Index Of Activities Of Daily Living
IADL	Instrumental Activities of Daily Living Scale
eCCIS	Questionnaire on service utility and costs.

On the basis of surveys such as PIRU, GDS, the patient empowerment initiative was possible to be taken by the three EU projects: SmartCare, BeyondSilos and CareWell. Implementation of these projects will inevitably deepen the possibility of wide adoption of the technology. Moreover, partners/regions will implement integrated care services with adequate incentives. Currently general care pathways should evolve in the direction of each individual track. This type of interaction will allow the patient to improve the integrated care. Integration is an extremely important aspect of health and social care for millions of people. It is not about the structure, organization and roads, it concerns the achievement of better patient outcomes.

The comprehensive transformation of health care, which is currently delivered to the patient, is based on technological innovation. The high demand for deeper studies concern the improvement of multidisciplinary IT infrastructure, better communications, high-quality data and the highest quality tools. This translational vision is building a vision of Digital Patient (ang. Discipulus Project 2013) .

3.2 Participatory action research model of seniors involvement in informing the design and improving the functionality of the systems.

One of the ways to respond to the need of profound empowerment and involvement of elderly people in designing and using ICT based health systems can be an exploration of participatory action research (PAR), which is a methodological approach based on social sciences. It gives a non- researcher a status of quasi researcher and increases their involvement in designing, implementing and maintaining vital social innovations. Such approaches respond well to the needs of all adults as a learners, social actors and proactive beings.

According to Baum, McDougal and Smith (2006) PAR differs from most other approaches to public health research, because it is based on reflection, data collection and action that aims to improve health and reduce health inequities through involving the people who, in turn, take actions to improve their own health. An attempt of applying the PAR approach in ICT-based health intervention was the idea behind the design of STAMFoRd concept (consortium of H2020 PHC – 21-2015, Advancing active and healthy ageing with ICT: Early risk detection and intervention, http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2268-phc-21-2015.html led by Italian company, ENG, currently in the process of reviewing). The concept intends to realize an innovative, unobtrusive, intuitive and cost effective Indoor Falls Risk Monitoring and Management System for older adults living in nursing homes and/or alone at home. The main goal to achieve is to develop and validate an integrated ICT solution for predicting indoors falls aimed to tailor ICT interventions.

In this concept the interests and the balance of power between the different social groups involved are decisive in determining whether or not the end-users become real participants in the design process. Standard protocols will be developed in STAMFord according to state of the art in the field:

- the level of regulatory controls will be commensurate with the potential risks associated with the technological ecosystem to protect the end-user while ensuring continued access to new technologies and an innovation-friendly business environment;
- regulatory framework addressing a life cycle of the project will include definition and classification of the end-user devices, essential principles of safety and performance, quality system requirements, vigilance system requirements and the use of international integration standards;
- the use of international nomenclature and standards will be encouraged, due to the need of exchange technology between two end-user locations of partners in the project. The level of regulatory control for the end-user should increase with the rise of the degree of risk, taking account of the benefits offered by use of the device.

Since real end-user participation is essential for the successful outcome of the observation and

prediction process, another factor will be introduced - a social-science based PAR approach will be used to involve seniors, to empower them and to increase their independence and control over the whole process of engagement in the project's activities, as a complementary protocol to the full compliance with technical requirements.

What would be the added value of PAR, on top of standard protocols of ensuring end- users engagement?

- PAR's main goal is to enable action. Action is achieved through a reflective cycle, whereby participants collect and analyze data, then determine what action should follow.
- PAR's approach pays careful attention to power relationships, advocating for power to be deliberately shared between the researcher and the researched: blurring the line between them until the researched become the researchers. The researched cease to be objects and become partners in the whole research process.
- unlike other static approaches, PAR does not remove data and information from their contexts. Most health research involves people, even if only as passive participants, as "subjects" or "respondents". PAR advocates that those being researched should be involved in the process actively. The degree to which this is possible in health research will differ as will the willingness of people to be involved in research (Baum at al., 2006 , p. 854)

4 CONCLUSIONS

The recommendation for improving future practices in the elicitation of seniors´ involvement in ICT-based health solutions, based on the experiences of ongoing and future projects in the field can be summarized as follows. With aging population it is a vital social and economic purpose to develop complex and, sophisticated, yet easy to use and reliable, ICT systems supporting wellbeing, healthcare and interventions. It calls for sustainable development: in order to make such systems useful and productive there is a need for advancement in the field of technology and a need for advancement in the methods of involving active seniors in designing such services. Both fields need to be balanced, but they cannot be developed separately – there is a call for synergetic and socially innovative approaches. One of the ways to achieve that is to take multidisciplinary approach and equally respect all the sciences: medical, technical, social and humanities - to build integrated systems supporting and empowering all involved participants. The biggest challenge so far is to successfully communicate between all the disciplines, while designing, testing and developing products and services, but without tackling it, the profoundly integrated approaches will not be achievable.

REFERENCES

Baum, F., MacDougall, C., & Smith, D. (2006). Participatory action research. Journal of Epidemiology and Community Health, 60(10), 854–857. doi:10.1136/jech.2004.028662

Cooper at all 2001

Barker, M., Baird, J., Lawrence, W., Jarman, M., Black, C., Barnard, K., Cradock, S., Davies, J., Margetts, B., Inskip, H. & Cooper, C. (2011). The Southampton Initiative for Health: a complex intervention to improve the diets and increase the physical activity levels of women from disadvantaged communities. J Health Psychol. 2011 Jan;16(1):178-91, doi: 10.1177/1359105310371397

Digital Patient Roadmap, Discipulus Project, DISCIPULUS Roadmap for the Digital Patient FINAL DRAFT, May 2013

WHO (1981). Global Strategy for Health for All by the year 2000. Geneva: World Health Organisation. Retrieved July 17th, 2015 from: http://whqlibdoc.who.int/publications/9241800038.pdf

Gosbee, J. and Ritchie, E. (2007). Human–Computer Interaction and Medical Software, Interactions, July/August.

Hendrick, E., Schooley, B. and Gao C. (2013). CloudHealth: Developing A Reliable Cloud Platform for Healthcare Applications, IEEE International Workshop on Consumer eHealth Platforms, Services and Applications, 2013 (accepted)

Norman, D.A. and Draper S.W. (1986). User centered system design: New perspectives on human- computer interaction. Lawrence Erlbaum Associates, Hillsdale, NJ.

Martin, L. R., Williams, S. L., Haskard, K. B., & DiMatteo, M. R. (2005). The challenge of patient adherence. Therapeutics and Clinical Risk Management, 1(3), 189–199.

WHO (1998).The World Health Report 1998 Life in the 21st century A vision for all Report of the Director-General, World Health Organization.