

**PERSON CENTRIC INFORMATION SYSTEMS –
MODERN, FLEXIBLE AND ACCESSIBLE SOLUTIONS FOR PROMOTING
AN ACTIVE AND HEALTHY AGING**

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Abstract: The aging of the population, as a result of lower birth rates and of increasing life expectancy, represents a contemporary well-known phenomenon.

The empowerment of the citizens regarding their own health, the sustained access to education and knowledge represent fundamental values in the nowadays Information Society.

Supporting a healthy and active way of aging means to promote health throughout life, intended to prevent health problems and disabilities, education that concerns adapting a healthy lifestyle and fighting health inequalities. All these can't be done without the access to medical information updated and adapted to the various categories of citizens.

Health and social care are becoming increasingly person-targeted and individualized, knowing an important development in recent years due also to the rapid development of new information technologies that are revolutionizing both the health promotion and the disease prediction, preventing and treating.

This paper addresses the person centric information systems that belong to the medical domain and which are oriented towards the user level and interests, with a major contribution to the problem of senior inclusion. The main objectives include achieving an independent living, restoring the vitality of the adult body, social reintegration and reduction of geriatric problems.

Being used by people with various disabilities (such as the elderly) involves choosing a design of these information systems that pay particular attention to accessibility, information content and usability.

Information technology is a major factor for ensuring a better citizen-oriented assistance, lower social costs, facilitating the mobility, independence and health of the seniors.

Introduction

The current demographic shifts and aging populations represent a huge challenge to our healthcare and social systems—as well as an unprecedented opportunity to transform an industry, which still lags behind other sectors in making best use of Information and Communications Technology (ICT) to drive efficiency, quality, and access to care.

In developed countries, the most noticeable change will be the balance between young and old. As a result of our increasing longevity and declining birthrates in many countries, by 2060 there will be more than twice as many people over 65 as there are children. (European Commission and the Economic Policy Committee, 2009) While this is a tribute to advances in medicine, it comes with a marked increase in demand for health and care services.

Information and access to information are critical issues in healthcare. Increasingly citizens are searching for health information on the Internet. The ICT can act as an enabler to empower citizens in their health management. However, one of the problems that citizens face is that of evaluating (health) information.

In most countries of the world, the older persons do not enjoy a decent status in society. Consequently, there is an urgent need to empower the elderly through implementation of mass action programmes and adapted ICT.

Empowering the seniors consists of enabling them in at least three spheres or dimensions of life, namely; economic, social, and health.

Addressing the needs of older citizens is now an essential element of the inclusion policies of both national governments and the European Union, and there is awareness that ICT can be of great significance in achieving goals in this policy area. In a report for the European Commission about the potential of ICT in supporting “active aging” it is concluded that, “Holistic policies are needed to support learning opportunities in aging societies.” The policies recommended, in the context of the recognition of learning as a central aspect of “successful aging”, are: supporting local communities in providing suitable ICT facilities; encouraging ICT-based networking to involve older people in communities, virtual and otherwise; promoting ICT-related learning opportunities; funding relevant R&D projects; the linking of different policy areas; and the development of content of IT literacy courses. (The Lifelong Learning Programme, 2007)

Empowerment of Senior Citizens

We are living in the midst of an unprecedented transition: the rapid aging of the inhabitants of the industrialised world, accompanied by a diminishing number of young people.

The meaning of empowerment means giving the power to citizens so that they harness their own abilities.

Aging affects all domains of an individual’s life and causes age-specific barriers, such as limitations of mobility, visual and hearing impairments and a high disease susceptibility, especially for chronic diseases. Elderly people have an increased demand for support and care in everyday life. To be independent means being able to perform all necessary activities despite such age-specific constraints, even with the support of technology.

Facing the challenges and opportunities of aging societies in Europe, there are also chances: technological and socio-economic innovation can enhance the quality of life for

older and impaired people. It is assumed that new Information and Communication Technologies for elderly people will play an important role in solving some future problems. (Augusto, 2006)

E-Health in the Aging Society

The benefits of e-Health for a safer and more efficient health sector have long been recognized:

- e-Health offers solutions that can bring enormous savings. If properly deployed, e-Health could contribute to the transformation of the health sector and change substantially business models of health and social care facilities.
- For individuals, e-Health brings new possibilities in terms of increasing quality and effectiveness of services.
- For society, e-Health represents a challenge for interoperability, and accessibility of new technologies.

While new ICT can worsen the exclusion experienced by aging and disabled persons in terms of their access to information and full participation to society, they can also provide extraordinary assistive solutions to empower them. New, proven technologies can enhance the lives of seniors and people with disabilities and support their rights as citizens and participants in their communities' social and economic activities - but only if these solutions are affordable.

Seniors might struggle to use ICT because of:

- accessibility issues
- usability issues
- physical, cognitive, and emotional barriers
- lack of computer skills
- cost
- attitude

When it comes to the design and development of new devices and services for independent living, the specific requirements of users have to be taken into account as well. They must ensure and guarantee an accessibility and usability by older people, people with various disabilities as well as other users.

With regard to individual, economic and social challenges by demographic trends, it is clearly stated that ICT can make key contributions to an independent living of elderly people. This refers to the following points in particular:

- ICT can reduce high expenses or health and care services
- ICT has the potential to provide individual solutions and hence to meet individual needs
- ICT has the potential to improve living standards
- ICT opens new business opportunities. (Malanowski, 2008)

Patient Centric Information Systems

A typical risk of aging is the loss of everyday competencies. Considering that professional and familial support options are continuously decreasing, technological devices are able to

provide compensation and assistance. Today's ICT enable people to use a broad variety of information and education offers.

Seniors are often faced with complex information and treatment decisions.

Some of the specific tasks aging persons are required to carry out may include:

- evaluating information for credibility and quality,
- analyzing relative risks and benefits,
- calculating dosages,
- interpreting test results,
- locating health information.

In a more "patient-centric" health and social care system individuals need to take an even more active role in health care related decisions.

Empowered aging persons are required to :

- find the most appropriate health information
- evaluate information for credibility and quality
- analyze relative risks and benefits
- calculate dosages
- interpret test results

While exacerbated by an aging population, poor lifestyle choices remain one of the main issues that lead to increased costs of healthcare. The key challenge is convincing individuals to change deeply ingrained lifestyle habits. The increased focus on behavioral modification requires IT specialists and health professionals to profoundly re-think how they design, communicate, and deliver Health Information Systems.

The emerging solution is a "person-centric" approach that tailors behavioral-modification strategies to individual needs, able to empower individuals with comprehensive personalized health awareness. Innovations in new HEIS advise and motivate patients to make better health lifestyle decisions and enhance their personal medical compliance. (Ianculescu, 2009, p. 85)

Patient Centered Information Systems empowers individuals (and their family support networks) with comprehensive personalized health awareness. They can make the relevant information more accessible for doctors and other health care professionals and they can make the patients, the average citizens or the aging persons more informed about their own state of health and about the means to preserve it.

The following two projects – AgingNice and AGECDV - belong to the health education information systems with particularization in the anti-aging domain and allows the sharing of the knowledge concerning the specific research and the promotion of the theoretical and practical information, both among the stakeholders from the medical area and at the person level. They are research projects developed inside the National Research, Development and Innovation Plan for the period 2007-2013.

The main objectives of "***Multidisciplinary Complex System for the Efficient Management of the Anti-Aging Information – AgingNice***" can be synthesized like this:

- creating an environment able to facilitate the knowledge, information and data circulation aiming an efficient management of the anti-aging domain;
- supporting and motivating the actuality of the anti-aging concept and increasing the quality in health systems;

- developing the informational space of the Romanian state of health;
- valorizing the advantages offered by ICT regarding the accessibility of the information in the anti-aging domain.

AgingNice comprises tools and information concerning anti-aging methods and strategies, clinical and laboratory investigations for preventing aging, anatomical modifications, educational models, self-evaluation tests, defining a personalized demeanor, tendencies in the anti-aging biomedicine, anti-aging campaigns and applications for facilitating the dissemination of the therapeutic protocol, case studies and recent research among the specialists.

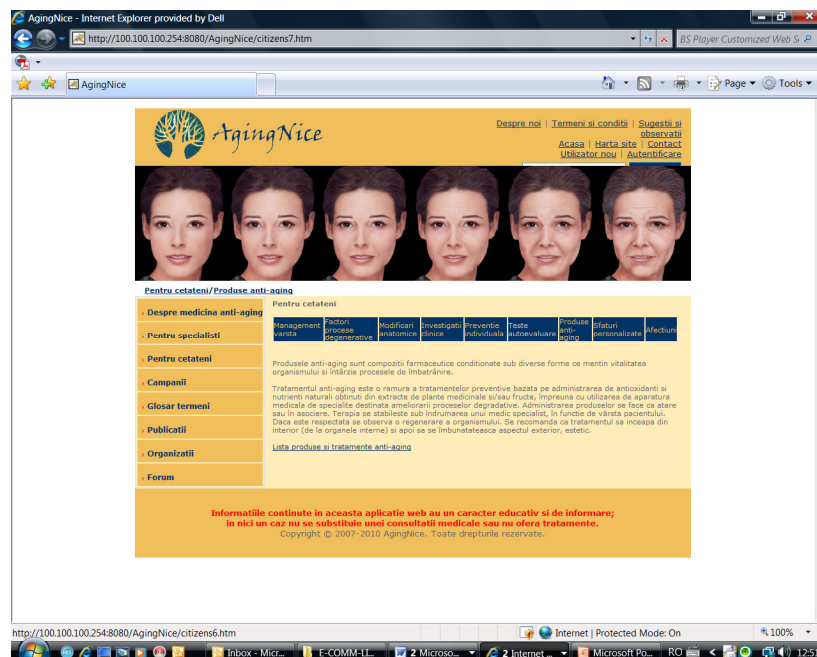


Figure 1. The interface of the "For citizens – Anti-Agings Products" module

The extensive using of AgingNice will have as consequences:

- the recognition of the timeliness and importance of the concept of anti-aging, of the multiple implications of implementing the strategies related to the individual and society as a whole,
- the understanding of the fact that, in terms of economic and financial, it is more effective to prevent the degenerative diseases than to treat them,
- the improvement of the specialized knowledge and the professional skills for increasing the performances,
- the integration of the research, education and training activities with information technologies,
- the changing of the attitude towards the age management,
- the intensification of the collaboration among convergent specialties for considering thoroughly the anti-aging domain,
- the facilitation of the communication among the professionals and between those and the citizens.

AgingNice demonstrates that the information and communication technology has a deep integrating character, both at the level of the information management and at the one of the development of the modern health systems, putting efficiently into value the opportunities offered by a fast accessibility.

The research project ”*Complex Study of Metabolomics, Genomics, Epigenetics of Age Related Atherosclerosis and Cardiovascular Pathology – AGECDV*” is designing a protocol of investigations, diagnosis, treatment and monitoring of atherosclerosis and cardiovascular diseases specific of aging and is developing a system of health information for collecting and analyzing results of biomedical investigations and psychosocial surveys.

The health information system of AGECDV will disseminate the results and it will facilitate the communication among specialists, with an important impact on the Romanian elderly health condition and life span increases.

The main objectives of AGECDV are:

- to establish markers that predict the risk of atherosclerotic processes developing and progressions’ as involved with aging related cardiovascular diseases and in view of a larger range of preventive strategies, which might contribute to elderly’s health condition improvement.
- to create a framework to facilitate transfer of data, information, knowledge.
- to support and provide arguments for the novelty of an integrative approach on aging related atherosclerotic processes that impact health condition and life expectancy increase.
- to disseminate the research outcome, by organizing an open space for informing specialists and individuals of the general public with interests in preventing and treating causes of pathology induced aging;
- to continuously update knowledge on atherosclerotic processes’ complexities and CV pathology by use of a health information application which ensures a higher degree of flexibility to changes and efficiency in handing over information.

Taking into account the national strategy priorities, this project will have a social impact because it will improve collaboration among specialists and organizations making decisions that concern the health of the population. AGECDV will draw attention for officials in charge about consequences of not considering prevention and evaluations of the degenerative processes.

Conclusions

Although aging is a global phenomenon, the ICT market for the aging society is still in an early stage and still does not ensure full availability and adoption of appropriate solutions based on Information Communication Technology. The reasons include the low level of awareness of opportunities and of user’s needs, the insufficient concern of the specialists and stakeholders, the lack of interoperability and high costs of development and validation.

Now is the time for patient centric information systems to enhance patients’ lives and to offer new tools to health professionals; they can help addressing the major challenges brought by demographic changes and offer major opportunities for the citizens in order to improve their state of health and social involvement.

Age-adapted health information systems can play an essential role in improving health for seniors by developing and promoting strong health information and knowledge.

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