

Making More Efficient the Dissemination of the Information in the Field of Anti-Aging through Information Technology

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ICT have become extremely important because they allow everybody to participate at the Information Society, in spite of under-privileged personal or social situation. Health Education Informatics Systems (HEIS), as a method for facilitating the exchange of information between specialists, physicians and patients, or authorized organisations, become a necessary modern tool which offer quality solutions, a correct source of information and pertinent instrument for taking decisions. The members of the aging society must be motivated to have access through ICT at knowledge that can improve and prolong the active life. The dramatic demographic transformations of our century have imposed the reconsideration of the social policies and of the use of HEIS for disseminating the anti-aging information, for empowering the person regarding his own state of health, and also for the real involving of the elderly in using the Internet. AgingNice is a multidisciplinary complex system that belongs to the health informatics systems with particularization in the anti-aging domain and that 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.

Keywords: anti-aging, elderly, ICT, health informatics systems, web services.

Introduction

A healthy way of living means both the promotion of health during the entire life focusing the prevention of health problems and disabilities starting from an early age and the fighting against the inequities in the health domain associated with the social, economics and environmental factors.

The self-determination of the citizens represents a fundamental value; the medical assistance becomes more and more patient-centered and individualized and the patient himself becomes more and more an active subject instead of a simple object inside the medical assistance services.

The aging of the population, resulting from the lower rates of birth rate and from the increasing life expectancy, represents a well-known phenomenon nowadays. Till 2050 the people over 65 will have a 70% growth in EU and those over 80 a 170% one. [1]

In the terms of the accelerated aging of the modern society it is desirable to integrate in all EU policies the preoccupations regarding health; envisaged actions aim to decrease the

inequities among this domain and to emphasize the promotion of health and the improving of informing.

A healthy aging is supported by actions meaning to encourage the adoption of a healthy way of living, to reduce the harming behavior, to prevent and treat some specific diseases. These will lead to the prolongation of the active life, the population will be able to enjoy a good state of health while the life expectancy will be bigger and bigger, and the health costs due to the aging of the population might be reduced at half. [2]

The Information society may allow the elders – wherever and whenever they want – to fully participate at the social and economic life and to be as active as the other citizens.

1. Anti-aging

Anti-aging represents a new concept that tackles the body health from another perspective – the one of preventing and treating the degenerative diseases with a therapeutic protocol elaborated by a team containing all of medical specialties. The result consists in the

delaying of the aging process and restoring the vitality of the mature body, but also an aesthetic appearance that harmonizes with everybody's wishes.

The scope of the anti-aging medicine is not only to prolong the life in the older adult stage, but rather to delay the aging process and to offer everybody the biggest number of possible years of maturity in a good state of health.

Preventing the aging can also be done at older ages when it is tried to maintain the actual physical and psychical capacities. Life expectancy has significantly increased in the last decades due to the latest scientific discoveries and it's very likely to reach the centenary without any difficulties.

The fight against the aging process and longevity represent a global concept, which involves the co-operation and interaction not only between different branches of medicine, but also the collaboration with the science (chemistry, physics, biology, genetics etc.)

2. ICT and the Aging of the Population

The health care has known lately an important evolution due to the fast development of the new technologies, including ICT, which revolutionize the way how health is promoted, and also the way how the diseases are anticipated, prevented and treated.

The demographic change presumes important challenges for European society and economy. ICT can play a significant role in approaching these challenges because they allow the management and providing of health and social services more efficiently and they offer more opportunities for communitary attendance and self-nursing, for innovation in terms of services.

They can help the elderly people to obtain an improvement in the quality of life, to remain healthy and live independently more time. In the meeting issues of memory, vision, hearing and mobility, which occur more frequently with age, innovative solutions are developed. [3] Also, with the help of ICT, elderly can remain active in the workplace or community, their experience and qualifications being a considerably resource, especially in

the knowledge society.

Older users can be much better informed than ever before and thus can take increasingly more responsibility as regards their own health, physical condition and living with independent information on the Internet, special television channels and the individual solutions offered by ICT in terms of daily life, personal health and physical condition.

Access, affordability and ease of use of equipment and services are necessary pre-conditions for providing advanced services for the aging society. However, ICT basic products and services rarely meet the needs of the elderly, such as those related to multiple progressive deficiencies associated with aging.

Markets tend to ignore the needs of older users: there are few guidelines, voluntary or mandatory standards and regulatory frameworks relating to them. Products and services are not adapted so as to prevent the specific needs of older users or are not available adequately, and thus enhance the feelings of frustration and dependency. If no measures are taken, this situation will also become real for "future elderly" due to rapid evolution of technology.

ICT for the older people is currently in an early stage: science and technology are growing rapidly and promise increasingly more intuitive solutions, intelligent and efficient in terms of costs.

At the end of 2006 there were still significant differences between average population of the EU (59% - the minimum level of IT skills) and certain groups, particularly people aged more than 65 years (only 17% possess IT skills).

Starting from the premise that the development of the Internet has fundamentally affected the architecture of informatics applications and the disseminating of information, substantial changes have occurred in the manner of distribution and accessibility of the solutions in this category.

Given these considerations, one can say that access to health information systems through a simple Web browser came to meet the needs of a world characterized by dynamism

and globalization.

3. Policies and Strategies

Demographic developments, including an ageing population, change pathological models and pressures on health systems sustainability of the European Union.

Health policy at community level should promote health and support sustainability in the context of common principles in health care systems of the EU, which comprise the fundamental values of universality, access to quality care, equity and solidarity.

The important role of the European Community in the health domain has been reaffirmed in the *Reform Treaty* agreed by EU Heads of State and Government at the meeting in Lisbon on 19 October 2007, it aims to reinforce the importance of health policy, given that some increasingly large problems for the population health arise, which leads to the necessity for a new strategic approach.

Within the i2010 initiative it has been launched an *Action Plan with the theme "Aging Well in the Information Society"* [4], which has as its objectives not only to improve the quality of life of older people by realizing significant savings for health and social services, but also to offer the necessary support for creating a strong European industrial basis for ICT and aging phenomenon. It identifies priority areas and actions through which ICT can best respond to the challenges and opportunities involved by European aging population and it coordinates the research programmes of the Member States for the elderly in ICT domain. By implementing this plan is intended to stimulate the market-oriented research on applications for an independent life. The Action Plan represents a first response of European Commission to the *Riga Ministerial Declaration* in 2006 on e-inclusion [5] and it supports the European policy on economic growth and competitiveness domains from the Lisbon agenda reviewed, on demographic change, employment, health and equal opportunities. [6]

The research problem in the ICT for the elderly had been also discussed in the e-health and e-inclusion initiatives in the *Seventh*

Framework Programme for Information Society Technologies, focusing on the involvement of users and widespread development of ICT solutions easily accessible to the elderly. It will bring together research and development projects of the European Union and other projects in order to contribute at the creation a common framework for interoperability of ICT solutions and services for the elderly.

The authorities at all levels together with the enterprises and social organizations are responsible for enhancing the powers of informatics skills, according to commitments made at Riga and the *EU Recommendation on key competences for lifelong learning*. [7]

4. "Multidisciplinary Complex System for the Efficient Management of the Anti-Aging Information" (*AgingNice*)

Taking into consideration that Romania has an aging population (14% of its population is at the third aged, there are over six million pensioners, and the figures will increase in coming years), the phenomenon should preoccupy us increasingly more.

In our country the use of information technology in the field of anti-aging is insignificant and does not cover the requirements of professionals and the need to inform the citizen. Web applications in this area focus mainly on the aesthetic aspects of aging by presenting cosmetics products.

At the same time, there are more and more professionals specialized in anti-aging medicine and a few organizations that are involved in preparing citizens to extend active life. Doctors are interested in an area with so many implications, but they do not have access to recent centralized information.

AgingNice is a research project developed inside the National Research, Development and Innovation Plan for the period 2007-2013 (NP II) is the main instrument by which the Romanian National Authority for Scientific Research (NASR) is implementing the National Strategy for RDI.

4.1. General presentation

AgingNice is a multidisciplinary complex

system which, in the context of the constant and accelerated aging of the population, creates an environment for developing an efficient age management, for improving the correlation of the multidisciplinary knowledge in the anti-aging domain, the promotion of the specific research, the strengthening of the link between the medical staff and the patient by increasing the informing degree of the citizen.

Such an informatics tool covers the insignificant use of the ICT in the anti-aging domain, emphasizing the information presentation done as understandable as possible and the adaptation of the communication strategy to the targeted beneficiary's response and needs.

The partnership ensures a multidisciplinary collaboration among divers categories of physicians, biologists, IT specialists and researchers, a key element for an efficient management of the anti-aging domain.

With the help of the disseminated information, it is obtained the raising of the degree of awareness and the changing of people's mentality regarding the necessity of modifying the lifestyle, to make a person more responsible about his own state of health in order to prolong the autonomy and the quality of life till an advanced age.

The beneficiaries of the web application are the average citizen, professionals interested in the field of anti-aging and organizations and bodies with powers on the health status of the population.

4.2. Objectives

- to concentrate the information in a relational database system in order to facilitate a fast access;
- to enable the interface between the medicine and computer science by developing the capacity of correlating the scientific and technical knowledge;
- to establish an environment concerning the multidisciplinary collaboration among the variety of medical and biological specialties involved by the domain;
- to increase the responsibility of the beneficiaries regarding their own state of health and

their guidance for choosing a healthy way of living able to delay the aging;

- to offer the necessary information to the anti-aging practitioners for choosing a therapeutic protocol in order to prolong the longevity and to combat the anti-aging phenomenon;
- to organize an open informational space for the specialists and citizens interested in the prevention, improvement and treatment of aging causes;
- to create educational and evaluating models for a person in order to outline his biological evolution and to identify the risk factors;
- to provide reliable anti-aging knowledge, permanent updated with the help of an informatics tool that ensures a high degree of flexibility to changes and an effectiveness of the information management.

4.3. Methods

AgingNice is an informatics tool that comprises an interconnected database system. It centralizes in a single point with stratified access a variety of web services and information classified by the user's type (ordinary citizens and professionals), with long term benefits for person and society.

To achieve a web application to align the latest European strategy in the field of anti-aging, the partnership project has identified specific priorities adapted to the Romanian environment and it has correlated them with the European ones, taking into account the particularities of the Information Society in Romania.

The complex system has an architecture that is structured into modules, allowing that new functionalities could be easily added, without damaging the existing components or having to reorganize the existing data from the system.

The problem of the technical accessibility is solved by using a web-based solution, a web browser being the only necessary condition for the user to connect to a system, with no need for other applications.

The information, updated in real time by specialists with concerns of in the field of anti-aging, is presented in a clear and concise lan-

guage and is structured on logical and intuitive modules.

The designing of the web pages is made taking into account the possibilities for coverage of the user, so that the quantity of information contained in a page not to overwhelm the visitor or to increase the time of loading. Also, the fragmentation of information has been designed in order to focus the user's attention on the main topics from the page and to help him to inspect gradually the presented subject.

To facilitate the access to information regardless of the user's skills, there are provided clear navigation elements, perfectly adapted to the way in which links between pages are established, which provides visual clues about their function and which helps to orientation.

The performances of this system take into consideration the user-friendly interface, safety functioning and data, high response time.

It is envisaged the possibility of migrating the system towards a next generation technology since the designing.

It is a system characterized by modularity, flexibility, platform independence, dynamism, accessibility, multidisciplinary, interoperability and it respects the main tendencies of developing the health informatics systems.

The security of the information is ensured by a divided hierarchical access at the system's functions and informational resources.

4.4. Results

The application with database available via Internet comprises an interconnected database system concerning anti-aging methods and strategies, clinical and laboratory investigations for aging preventing, anatomical modifications, educational models, self-evaluation tests, defining a personalized demeanor, tendencies in the anti-aging biomedicine, anti-aging campaigns and also applications for facilitating the dissemination of the therapeutic protocol, study cases and recent research among the specialists from large range of medical domains.

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 effectively 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.

The project emphasizes the disseminating of the results of the relevant research in the aging processes also by using the mobile communications technology to link to the Internet.

Conclusions

Although aging is a global phenomenon, the ICT market for the elderly in the Information 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.

The multidisciplinary complex system for the efficient management of the anti-aging information (AgingNice) creates favourable conditions for the participation of all at the Information Society, including the groups exposed at risk of exclusion because of their age.

References

- [1] Previțiuni demografice ale Eurostat publicate în Ziua internațională a persoanelor în vârstă, 29 septembrie 2006
- [2] Comitetul de politică economică și Comisia europeană (SDG ECFIN) 2006, European Economy, Raport special nr. 1/2006, *The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long term care, education and unemployment transfers (2004-2050)*, 2006.
- [3] Comunicare a Comisiei către Parlamentul european, către Consiliu, către Comitetul Economic și Social European și către Comitetul Regiunilor - *A îmbătrâni frumos în societatea informațională - O inițiativă i2010 - Plan de acțiune privind tehnologiile informației și comunicațiilor și fenomenul îmbătrânirii* {SEC(2007)811} COM/2007/0332 final
- [4] COM(2005) 229: inițiativa pilot i2010 „privind nevoile societății în curs de îmbătrânire, mai ales îngrijirea persoanelor într-o societate în curs de îmbătrânire și abordarea tehnologiilor pentru bunăstare, viață independentă și sănătate”, 2005
- [5] Conferința ministerială de la Riga privind TIC pentru o societate integrantă și Declarația ministerială de la Riga, iunie 2006.
- [6] COM(2005) 658, COM(2006) 30, COM(2005) 525, raportul grupului Aho; Directiva 2000/78/CE a Consiliului; SEC(2006) 1195; COM(2003) 650.
- [7] Recomandarea 2006/962/CE a Consiliului și a Parlamentului European