

The Internet and the Democratization of Access to Knowledge. Study Case: CID

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Abstract —The democratization of access to knowledge and Internet has been expanded to include more qualitative dimensions relating to the extent and diversity of use, the quality of technical connections and social support, the relevance of content, and the ability to contribute to content development. The consequences of ICT have been multidirectional and contradictory, but they have made sharing potentially easier and cheaper than ever before. “Informational Centre of Dermatology” is a health informatics system that facilitates the dissemination of health knowledge and education.

Keywords — access to knowledge, democratization, health education, health informatics systems, Internet.

I. INTRODUCTION

KNOWLEDGE and information are key resources for the global society. The vision of a global Knowledge Society embraces the democratization of knowledge and of access to knowledge [1].

The Internet has fundamentally changed the practical and economic realities of distributing knowledge; it offers the chance to constitute a global and interactive representation of human knowledge and the guarantee of worldwide access.

The democratization of access to knowledge is the most fundamental way of increasing the opportunities and reach of individuals and groups. Through a democratic access, knowledge should be free of charge and free of most copyright and licensing restrictions. Unfortunately, in spite of new possibilities of knowledge dissemination by Internet, access to new knowledge might be still limited to a small, exclusive community.

Knowledge can be used to determine one’s own development path, in the sense of empowerment to participate in societal development. Information and Communication Technologies (ICT) have the potential to

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be a powerful tool for sustainable development that promote learning processes based on knowledge, ability and behaviour, and that extend the possibilities of action.

Internet facilitates new way of organizing knowledge in the modern world and it brought a big change in how we access information, allowing even the individuals to express their opinions or personal knowledge in an informal fashion.

Knowledge society must have a powerful and easy accessible communication infrastructure as the basis, prerequisite for a democratic access to knowledge.

II. THE IMPLICATIONS OF THE DEMOCRATIZATION OF ACCESS TO KNOWLEDGE

What’s undeniable is the Internet’s democratization of knowledge and information. It’s providing instant access to them and, in a sense, improving the practical application of intelligence for everyone. The democratization of knowledge is all to the good if that means the democratization of access to knowledge.

The Internet offers the possibility of a freedom of knowledge and information by opening a new medium of communication that escapes the traditional structures of someone’s control.

Furthermore, five specific features of the Internet open up possibilities for future development: interactivity, multiplicity, architecture, cost, and timing.

Under interactivity, we know that there is no such thing as an Internet content provider that is entirely different from an Internet user. Each user can provide content through communication by e-mail, bulletin boards, Web site design, many forms of real time “talk” etc.

Multiplicity is the Internet’s ability to offer multiple channels that, at least in theory, should surpass the number of television channels, newspapers, and radio stations by far. The Internet provides for potentially greater plurality of information than any other medium.

The architecture of the Internet also plays an important role, as what we call the Internet actually uses virtually all possible physical networks of communication to connect individual nodes into a “network of networks.”

Internet access cost is determined by cost of users’ hardware, speed and frequency of access, or other factors. The general belief is that the costs for knowledge and information should go down with greater availability on the Internet, but we are already starting to realize that with increased quantity of information, the task of evaluation and selection becomes costly for a consumer.

The timing factor is crucial for the Internet, because of its offered real time possibilities like one-to-one communication that is now almost always in real time (Instant Messenger, ICQ, and chat rooms) or has a little delay (e-mail and bulletin boards).

Each of these five factors will become increasingly important as Internet proliferation continues all over the world, with increasing implications on an open and democratic access to knowledge and information.

A. Challenges of Democratization

A more important issue in moving to a more democratic knowledge environment is the quality of the knowledge itself. Modern Information and Communications Technologies support the exchange of knowledge. They help organize knowledge, make it accessible and thus improving the way it is used. However knowledge cannot be seen as a separate entity detached from the people who have it.

A democratization of the access to knowledge will only be effective when the majority of society has access to knowledge and information and knows how to use it.

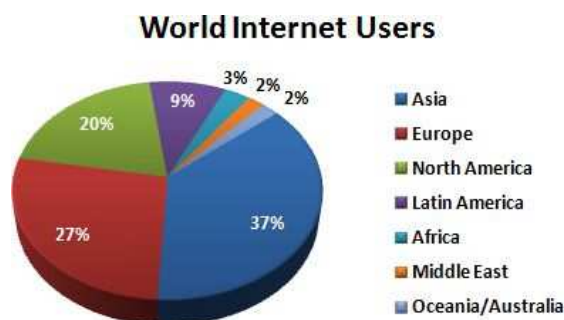
Learning is the essence of knowledge management, changing and adapting the way of doing things to new challenges is its result. People should improve continuously the way they use the knowledge to their own benefit, but they shouldn't neglect to learn how to use the permanent evolving ICT, because that will allow them to have access to knowledge.

Democratizing the access to knowledge should be facilitated by an end-to-end architecture, a decentralized content creation and low barriers to entry.

B. Barriers and Risks of Democratization

The world has become a much smaller place due to the ICT and the tremendously increased speed at which we can exchange knowledge across borders and continents. However, this evolution is not beneficial to all and has created multiple gaps, not only between the developed countries and the developing ones, but also in almost all societies, for example between the men and women, between old and young or between cities and rural areas.

As is seen in Figure 1, a quite reduce amount of world population has access to Internet.



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Figure 1. Internet usage statistics

On the Internet and in other environments where knowledge creation and distribution have already been democratized, knowledge quality levels can often be

unreliable or degraded.

Experience has shown that the success of democratizing the access to knowledge in a particular country depends highly on the existing political will to do so. Governments, therefore, have a major role to play in creating enabling regulatory and policy environments and formulating appropriate ICT policies. Efforts are also necessary on the international level and certain infrastructure projects and cost considerations may warrant regional or sub-regional ICT development.

The democratization of knowledge and access to it might generate new less stratified social models but also advanced forms of marginality.

C. Limits of Democratization

Democratization of the access to knowledge should not be confused with the democratization of knowledge itself. And this is where the Internet, or any system of electronic networking, may be misleading and even pernicious. In cyberspace, every source seems as authoritative as every other.

The Internet is an equal opportunity resource; it recognizes no rank or status or privilege. In that democratic universe, all sources, all ideas, all theories seem equally valid and pertinent.

There are lots to do and improve in order to obtain a real democratization of access to knowledge because some content is still expensive to be produced, the search engines are very important, many people are unable, afraid, not-tempted to use the Internet or they miss the skills to do that etc.

D. Consequences of Democratization

The Internet was praised as the key to democratizing knowledge and making information available to anyone with access to a computer. It improved the quality of life for of millions of people by providing them with new freedoms and liberties, and it laid the groundwork for a continuous education and information.

The knowledge available in the Internet is there thanks to the gradual addition of efforts made by individuals and social groups that express their interests.

Democratic approaches to knowledge can work well when the goal is only an approximate, convenient answer. Google, for example, employs a democratic approach to deciding what Web page you are seeking when you do a search. It ranks pages primarily on the basis of the degree to which other pages have linked to a page. The page-ranking algorithm may yield the site you seek, but it is usually just an approximate result. Similarly, while Wikipedia may have a lower definition accuracy level than Encyclopaedia Britannica, the encyclopedia is free and convenient to use, and it usually provides a generally correct answer.

Wikipedia might represent the democratization of knowledge itself, on a global scale, something possible for the first time in human history. Wikipedia allows everyone equal authority in stating what is known about any given topic and ensures a democratic access to the comprised

knowledge.

A real democratization of access to knowledge implies a broader access to education, also in the health domain. Health education is represented by all learning and teaching experiences that lead to improve and maintain the state of health and the development of ICT have had a strong effect on it

III. STUDY CASE: THE HEALTH INFORMATICS SYSTEM “INFORMATIONAL CENTRE OF DERMATOLOGY” (CID)

Health education is a process by which individuals and groups of people learn to behave in a manner conducive to the promotion, maintenance or restoration of health [2]. Health education is the most efficient mean to prevent the diseases, to improve and maintain the state of health. Adopting a healthy lifestyle is the main objective of the health promoting campaigns.

The health system depends more and more on informatics systems. There are three factors that strongly influence the development of processing the health information: the increasing number of the population, the medical discoveries and the development of Information and Communication Technology (ICT).

The complex integrated system “Informational Centre of Dermatology” (CID) belongs to the newest types of health educational applications that comprise the users’ motivation concerning educational content and its new promoting methods, obtaining better results in the learning process, developing new capacities (as the communication capacities), cognitive skills determined by digital information, like observing, viewing, a systematically approach and the information processing.

CID has as main users the Romanian citizen, the dermatologists, the organizations and stakeholders from the dermatology domain.

A. Aim

CID is a health education informatics system that aims to promote and preserve the state of health of the population by informing this one about how to create an attitude and a healthy behaviour able to prevent the dermatological disease.

CID is an efficient tool for promoting health, which facilitates the co-operation between the dermatologist and the patient by making the latter becomes aware about the implications of dermatological diseases, the risk factors for getting ill, how to avoid the illnesses and how he can maintain and improve his own state of health. The implementation of the system leads to change the people’s ideas about how to live and to understand that it is more efficient to prevent the disease than to treat it from the financial and social point of view.

The information offered by CID aims to supply, not to replace, the existing relation between a patient/user of this Internet application and his/her doctor.

In the same time, CID can be a modern tool that facilitates the access of the dermatologists to the updated information and knowledge in the domain, in order to

make them familiar with the latest approaches and trends of dermatology. Having at their disposal an informatics system with authorized access and reliable information, the physicians can establish efficacious dialogues and collaborations

B. Methods

CID is a web-accessible informatics product which comprises an inter-connected database system in the dermatology domain, having a modular structure that offers a variety of services and information addressed to specialists and patients.

The way in which the system was structured puts into value the educational approach adapted in accordance with the targeted user. The component applications aim the education concerning specific issues of promoting a healthy way of living for avoiding dermatological diseases, the awareness of the fact that health is an important chapter both for a person and the society, the identification and hierarchization of the health problems in the dermatology domain, the dissemination of the information regarding the illnesses and the prevention methods for avoiding these, the centralization of dermatological information needed for improving and updating the specialists’ level of knowledge.

The information is collected in a single point of stratified access and its safety is ensured due to a hierarchical access. It respects the main tendencies of developing informatics solutions for the health system, emphasizing the inter-operability as a must be demand to have an efficient exchange of health data and knowledge. It respects the quality criteria established by European Commission applied to health informatics products. These have been synthesized in 6 main groups: transparency and honesty, authority (sources of information), confidentiality and data safety, updating information, receptivity and responsibility, accessibility [3].

The used architecture is a Client Server type organized in three tiers and it has a structure organized into modules, being composed from elements that can function autonomously, and which architectural requirements were developed both for non-specialized users and health professionals. Each module was qualitatively evaluated for its ability to be linked with the others and for its coverage.

It is an open system that allows the interface with other applications addressing different medical domains. CID is a flexible health informatics system that can be adapted to the users’ demands and to the new trends from the dermatology domain.

The implemented solution has as its main objectives the performance, scalability, platform independence and accessibility of the complex integrated system. The performances of this system take into consideration the user-friendly interface, safety functioning and data, high response time. The problem of the 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.

Security controls are a part of the integrated system

design. Information technology security is used in order to control the access to the database and so to maintain a high quality of health information. Users must register with the authentication procedure and obtain a login ID and password to access the system.

C. Results

Dermatologists need to provide their patients with written health education materials that are patient-orientated and designed according to the best practice principles in written health education material design. They also need to be informed, to get in touch with each other and to improve their knowledge.

On the other hand, there is an increased need of the citizens for obtaining new knowledge and information about how to identify earlier their health problems or to prevent getting ill.

Health informatics systems are becoming more and more used for health education and "Informational Centre of Dermatology" is a useful tool that respects all the above desiderata.

Due to the health topic areas and discussion forums that are associated with the dermatology domain, a considerable information dissemination capability has been developed, adapted to the type of user, i.e. health professionals or non-specialists.

The user interface has an intuitive, ergonomic and friendly feature; it has a unique structure it allows an easy access to the functions and applications of the system.

All authorized users can easily add content to CID database (text, web links).

CID contains the following applications:

- "**For Patients**" – provides information for the ordinary citizen, concerning the novelties in dermatology, dermatological organizations and specialists;
- "**Preventing Dermatological Diseases**" – aims to foster the knowledge, the comprehension and the habits that encourage a person to change his behaviour. It presents the aggravating factors for health, the clinical and paraclinical investigations, a healthy behaviour.
- "**Correlation with Other Medical Specialties**" – monitors the correlation of dermatology with other medical specialties;
- "**For Specialists**" – creates an environment for information and collaboration, dedicated to the specialists so that they can find out the news in dermatological medication, scientific events, clinical cases;
- "**Leaflets for Patients**" – offers leaflets with dermatological information that can be used by the specialists to increase their patients' level of health education;
- "**Cosmetic Dermatology**" – contains information from this field of dermatology, like types of cosmetic, major mistakes in taking care of one's skin, hair, nails;

- "**Encyclopedia of Diseases**" – gives information about the main dermatological diseases;
- "**Medical Publications**" - a library with articles, reviews and books for the specialists and another one for non-specialists;
- "**Knowing better our...**" – a library with primary medical information about the anatomy of the skin, hair and nails;
- "**Legislation**" – presents the actual medical Romanian legislation;
- "**Forum**"- allows an interactive dialogue among users, one for the dermatologists and another one for non-specialists;
- "**Campaigns**" – promotes the preventing dermatological diseases campaigns;
- "**Glossary**" – put at the users' disposal a glossary with dermatological terms.

Furthermore, the system provides the following auxiliary functions: the possibility that the specialized institutions could apply on-line, presenting their specific and services; promoting EU initiatives in health education and prophylaxis domain.

Implementing CID solves the aspects concerning:

- the integration and fortifying of the knowledge and information coming from multiple sources;
- the setting up of the access rights so that the proper user might receive the proper information, at an opportune moment, with the help of the tools used everyday;
- a better understanding of the users' needs that will ultimately lead to make them stand to and to a better anticipation of the coming necessities.

IV. CONCLUSION

The Knowledge Society should embrace features guaranteeing that the effective democratization of knowledge, information and empowerment are at the core of development. However, in the Internet, democratization does not exist without free access and free software.

The tremendous development and use of the ICT in the health domain have demonstrated how easy, fast and cost-effectively the knowledge and information needs of patients and health professionals can be offered using interactive web-based applications like "Informational Centre of Dermatology".

A significant narrowing of the gaps appeared due to the spreading of the Internet shall need a large mobilization of civil society, governments and key economic actors involved in the development strategies.

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