INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) IN THE SERVICES OF HEALTHCARE SECTOR IN EUROPE

Pavel (El Baaboua) Florentina Ramona[1]

Abstract

Information and Communication Technologies (ICTs) consists of all technical means used to handle information and aid communication, including both computer and network hardware as well as necessary software. Information and Communication Technologies tools and services are used in many sectors like development, education, e-services, policy, health and medicine and so one. This paper links the ICTs tools and services for health. ICTs has the potential to impact almost every aspect of the health sector. Information and Communication Technologies (ICTs) have an important role in service engineering, improving medical knowledge and practice, and defining new fields of research.

Keywords: eHealth, healthcare sector, telemedicine services, health portals, health information networks, digital health infrastructure

Introduction

New information communication technologies (ICTs) are being developed every day and more and more people are gaining access to them.

Electronic communication comes in many different forms. These include:
- *Websites* - these are accessed via the internet and are like electronic brochures, with the text divided into pages. They can be categorised in different ways, for example according to their audience or subject. They usually provide summarised information that is either text-only or is accompanied by photographs, diagrams or video clips. They can be non-interactive (with the information just presented for the user to view) or interactive (enabling the user to communicate with the website and / or other users).
- *E-mail* this is accessed via the internet, it is like an electronic form of notes and letters, to which files and reports can be attached.
- *Databases and on-line resource centres,* they provide basic information about a variety of resources (such as articles, reports and manuals), including what subjects they cover and how they can be accessed.
- *CD-ROMs, VCDs* (video calling cards) in the form of a compact disc.
- *E-discussion groups* - conference calls that are carried out over the internet. They facilitate the exchange of experiences and opinions between different individuals, sectors and countries and focus on specific subjects, events or regions. They can be open (to anyone who wants to participate) or closed (accessible to members-only). They are usually moderated by someone who acts as a neutral facilitator.

[1] Ph.D. Candidate at the Academy of Economic Studies, Bucharest and assistant teacher at the Romanian-American university, Bucharest, e-mail: pav_florentina@yahoo.com

Electronic communication has a wide variety of uses and a great potential. However, electronic communication is not a magic solution and it has disadvantages as well as advantages. To be successful, it needs to be used strategically and planned carefully.

A major challenge, especially for the developing world, is to ensure that the benefit of ICTs experienced in the first world is not confined to these more privileged sections of our society, but spread throughout every sector and area of society. It is also not only the benefit that needs to be shared more equally. There is a need to change the developing world's participation in the knowledge-based economy from one of pure consumption to that of a full participant, encompassing both creation and consumption activities. The development of the information society and the wide-spread diffusion of Information and Communication Technology (ICTs) give rise to new digital skills and competences that are necessary for sectors like employment, education and training, self-development and participation in society.

Information and Communication Technologies have an ever-growing impact on our working and private lives so the healthcare sector is no exception.

Business processes in health care institutions are extremely complex and involve application of modern electronic health information systems. eHealth systems include tools for health authorities, the doctors access patiens medical records more easily, they have fast access at the results test from laboratory. The tools and services which contribute to eHealth provide more efficient healthcare services for all. The users of eHealth services can be from different cathegories of peoples and from different geographical location.

eHealth represent a big step in the healthcare sector. eHealth covers the interaction between patients and health-service providers, include health information networks, electronic health records, telemedicine services, wearable and portable systems which communicate, health portals, and many other ICT-based tools assisting disease prevention, diagnosis, treatment, health monitoring and lifestyle management. eHealth services promise to raise the quality of care in remoter and rural areas, thanks to modern communications infrastructure.

Technologies, especially ICTs, have a particular role to play in realising these changes. A number of international and local trends further indicate the need for a comprehensive national approach to ICTs and related innovation. Technology chains are increasingly more complex. As global markets expand and change, ICTs research and development are increasingly organised on an international scale as enterprises respond to new challenges.

What Is eHealth and the impact

Healthcare presents perhaps the most complex application of IT in any industry. eHealth (also written e-health) is a relatively recent term for healthcare practice which is supported by electronic processes and communication. The term can encompass a range of services that are at the edge of medicine/healthcare and information technology:
- *Electronic Health Records*: enable easy communication of patient data between different healthcare professionals (GPs, specialists, care team, pharmacy)

-*Telemedicine*: includes all types of physical and psychological measurements that do not require a patient to travel to a specialist. When this service works, patients need to travel less to a specialist or conversely the specialist has a larger catchment area.
- *Consumer Health Informatics*: both healthy individuals and patients want to be informed on medical topics.
- *Health knowledge management*: e.g. in an overview of latest medical journals, best practice guidelines or epidemiological tracking.
- *Virtual healthcare teams*: consist of healthcare professionals who collaborate and share information on patients through digital equipment.
- *mHealth or m-Health*: includes the use of mobile devices in collecting aggregate and patient level health data, providing healthcare information to practitioners, researchers, and patients, real-time monitoring of patient vitals, and direct provision of care (via mobile telemedicine).
- Medical research uses *eHealth Grids* that provide powerful computing and data management capabilities to handle large amounts of heterogeneous data.
- *Healthcare Information Systems*: also often refer to software solutions for appointment scheduling, patient data management, work schedule management and other administrative tasks surrounding health. Whether these tasks are part of eHealth depends on the chosen definition, they do, however, interface with most eHealth implementations due to the complex relationship between administration and healthcare at Health Care Providers.

The use of electronic patient records allows doctors to see much more of a person medical history than do paper files, which typically only include information on treatment in a single surgery or hospital. On-line tools can help patients to understand their conditions better and make it easier for them to find and talk to fellow sufferers, for example through on-line support groups which boost patients spirits in the face of serious illness.

Widespread implementation of eHealth will enable more “patient-friendly” healthcare services to be developed. This will offer healthcare providers a chance to become more flexible and better able to address the differing needs of individual patients.

The major impact of ICTs on *payers* will be the ability to manage the system in order to better account for expenditures, to manage the flow of funds and contain costs. There will be strong motivation to adopt systems which enable payers to track expenditures and exercise control over the processes of referral and prescription – the initiators of health services.

Electronic scheduling and patient management systems could improve scheduling of tests and procedures, and thereby reduce the length of hospital stays and reduce the need for multiple visits. Linking insurers, healthcare *providers*, financial institutions and consumers into claiming and payments systems also has the potential to reduce significantly administrative costs and improve quality of service.
From the perspective of individual medical *practitioners*, knowledge enrichment or education, practice administration, and clinical tools are among the most important ICT applications. Clinical tools hold significant promise, both in terms of direct efficiency and cost savings and in terms of influencing the behaviour and practices of doctors.

ICTs are altering the relationship and balance of power between *patients* and providers, leading to more empowered consumers and enhanced self, home and community care capabilities. Perhaps the greatest change in the patient-provider relationship will be brought about by the use of internet by patients.

Advantages of eHealth

ICTs and it's applications are increasingly, with demands for better healthcare, improvements in medical outcomes and maintenance of a relatively quality of life.

E-health tools and services enable more *efficient* organisation of resources and care provision leading to greater productivity. EHealth tools can help achieve much higher coverage, for example, ensuring that children receive the full programme of vaccinations at the correct ages.

Increasing efficiency involves at the same time improving *quality*.There can be no quality healthcare without the correct management of information and information flow. E-health may enhance the quality of health care for example by allowing comparisons between different providers, involving consumers as additional power for quality assurance, and directing patient streams to the best quality providers.

Another advantage it's the access to electronic *evidence-based* medicine libraries.

Encouragement of a new relationship between the patient and health professional, towards a true partnership, where decisions are made in a shared manner.

Education of physicians through online sources (continuing medical education) and consumers (health education, tailored preventive information for consumers).

Enabling information exchange and communication in a standardized way between health care establishments.

Extending the scope of health care beyond its conventional boundaries. E-health enables consumers to easily obtain health services online from global providers. These services can range from simple advice to more complex interventions or products such a pharmaceuticals.

Ethics - eHealth involves new forms of patient-physician interaction and poses new challenges and threats to ethical issues such as online professional practice, informed consent, privacy and equity issues.

Equity - to make health care more equitable is one of the promises of eHealth, but at the same time there is a considerable threat. People, who do not have the money, skills, and access to computers and networks, cannot use computers effectively, unless political measures ensure equitable access for all.

eHealth in Europe

Governments around the world hope that eHealth can contribute to increased safety, choice and productivity in the health care sector.

eHealth is an integral component of the EU's i2010 strategy set the aim of creating a single European information space, designed to strengthen a competitive internal market, increase investment and innovation in ICT research and better public services and quality of life through the use of ICT. eHealth has been identified as one of the key areas of focus in supporting better public services, and over the past four years, the EU has published a number of e-health studies and reports to support the objective as well as funding research in the area.

Technology is advancing at a fast pace and changing the complexion of our daily lives. Rapid and reliable ICTs have become a vital component of efficient and effective "health management systems" in Europe and their use in healthcare will grow strongly in the future.

ICTs can have a massive impact on all aspects of healthcare, from delivering the information people need to lead a healthy lifestyle to providing new tools to design tomorrow's medicines; from making healthcare systems more efficient and responsive to providing *in the home* and mobile healthcare technologies.

The EU's it's building a European eHealth Area coordinating actions and promoting the synergies between related policies and concerned parties in order to develop better solutions, to prevent the market fragmentation and to disseminate the best practices. Although ICTs have been revolutionising the healthcare sector in recent years, the EU has found that efforts across the continent have been fragmented. At European level, this fragmentation is even more pronounced. In a Union where citizens increasingly travel across borders, individuals should be able to find the highest standards of healthcare wherever they go. Building a European eHealth Area will facilitate this, a goal at the heart of the European Commission's strategy for the development of eHealth.

eHealth tools and services have been widely introduced, but too often health authorities, hospitals, or doctors have chosen and implemented their own individual systems. If these systems are able to communicate with each other, the potential benefits they can bring to patients will increase significantly.

eHealth systems are not just about replacing paperwork with smartcards, ICTs can make healthcare systems more cost-effective, allowing more funds to be spent on healthcare, and less on administering it, ICTs also enable healthcare to be personalised. This not only makes treatments more effective, it enables doctors to diagnose problems more quickly, and even predict them before they occur.
eHealth is emerging as an important new global industry - an opportunity Europe's healthcare and ICT industries must not miss. Europe's eHealth industry is fragmented, so action at the European level is essential to ensuring that European industry takes a leading position in this strategic field and bring these benefits to all Europeans.

Europe and the US may have very different ways of funding health, but they have much in common, too. A new program is exploring what we might learn from each other.

Microsoft has initiated a high-level research programme to search out and highlight the potential of ICT in healthcare, the low-carbon economy, education, and government and governance. Professor *Wendy Currie* from Warwick University in the UK is now working with her colleague David Finnegan and six researchers to apply a decision-making tool called TEMPEST to assess the status of eHealth adoption and diffusion at national, regional and hospital level, in 11 EU countries. The TEMPEST model with 84 indicators provides a means of evaluating eHealth from one country to another, helping to understand the issues in their entirety. eHealth – the application of ICT to the practice of healthcare – was the first fields to be tackled
Despite the largely private funding of healthcare in the US and the largely public funding in Europe, similar perspectives emerged of how ICT can drive much-needed innovation and transformation in healthcare.

Politicians talk of "meaningful change". Healthcare systems will offer it not by simply setting out to replace paper, but as a first step towards higher-performing practice – improving healthcare productivity at an appropriate cost for as many patients as possible. If we are going to make the change, the insurance companies and reimbursement agencies that meet the health bills, and government, have no choice: they must work with industry throughout the world to provide a consistent regulatory framework and incentives for healthcare providers to adopt broad-based and integrated healthcare IT.

The results from the eHealth strategies study underlined the maturity of eHealth and the significant learning processes that have taken place these past few years. Most member states have, in the past four years, moved from high level declarations to documents outlining concrete eHealth goals, implementation measures and past achievements. In some cases, for example Sweden, the policy documents now available are merely updates on the progress in the implementation of the national patient summary.

Translation of political goals into action on the ground is done across Europe through national competence centre which are overseeing the set-up of a national infrastructure and the specification of related services. National competence centres like Gematik, Germany's Society for Telematic Applications of the Health Card in Berlin; ASIP, France's Agence pour les Systèmes d' Information de santé Partagés in Paris; and THL, Finland's National Institute for Health and Welfare in Helsinki are increasingly used models of organisation.

At the core of ambitions across Europe are Electronic Health Record systems and ePrescription services. Electronic Health Record (EHR) systems are a consistent element in almost all strategies and roadmaps. However, EHRs are usually not well defined, and they often (implicitly) refer only to a kind of patient summary or similarly brief or basic patient record. It is also becoming apparent that clinicians' enthusiasm for comprehensive electronic health records, which may also connect patient data in diverse record systems at hospitals, community services etc., often relates more to perceived benefits on their immediate surroundings than to a geographically widespread sharing of patient data.

Conclusions

“Europe is leading the rest of the world in advancing towards modern eHealth infrastructures and implementations”, " was the conclusion of Dr. Karl Stroetmann of empirica Consultants at an eHealth Strategies Symposium in Brussels.
Empirica and its European partners have developed, carried out and evaluated a wide range of eHealth application projects, especially in the home care and hospital areas. In each case empirica works closely with both service providers in the health and social care sector and technology companies. The company has gained a strong profile not only in practical development, pilot-testing and market validation of IST-based healthcare services with industry and service providers, but also in studies of market trends and developments, including data bases of good practice case studies and foresight exercises, and involving representative surveys of both industry decision makers and citizens. A recent priority has been research on strategic issues (also for global industrial players) and eHealth policy topics involving not only the European Commission but also health ministry and other national representatives from all EU Member States and beyond.
More than 100 high level political representatives from European Ministries of Health, representatives of stakeholder associations and European policy institutions attended the workshop which showcased several good practice cases of Member States eHealth strategies and highlighted the overall trends across Europe with regards to eHealth initiatives and implementation.

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