ITC SOLUTIONS TO ACHIEVE PERFORMANCE AND EFFICIENCY OF HEALTH SERVICES: ONLINE VIRTUAL CLINIC

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Abstract:
The digital era modified the way people work, how the information and the informational resources are defined and organized. The organization which holds, uses and correctly reproduces the piece of information, the knowledge, the intellectual capital, becomes a leader in the proper field of activity. Following the actual tendencies in the digital era connected to the exchange of professional information, I can say that the exchange and sharing of digital information in a global multitude of interconnected computers are essential instruments that can contribute to the development and consolidation of the intellectual potential of the organization. This is why, the access of the individuals to information is an actual requirement of the development of the Romanian society in the context of globalization and world implication o contemporary processes and phenomena. The Digital integration eliminates the barriers that traditionally suppress the circuit of the medical information, lets the goods and services circulate to and from Romania by promoting efficiency as final purpose. Performance is needed in the health system, the transformation of the system of medical services by bringing the benefits of the medical science and technology to all individuals from every community. In order to accomplish these expectations it is needed that all the components that form the health system look at it as a whole and subscribe to modern solutions for improvement so that the quality of health should raise to an unprecedented level. Even if health systems differ from country to country from the organizational and financial point of view, they face the same challenges and problems, respectively the supply of medical care of better quality and keeping under control the health expenses. The use of information and communication technology in the field of medical assistance in order to stock, share, transmit and analyze clinical data and knowledge is more necessary than ever.

Keywords: Internet, communication in real time, health system, medical information system, digital integration, virtual medical assistance, virtual clinic, shared medical information

Introduction

A healthy population lays at the basis of economic growth and community prosperity. The last decade registered the expansion of Internet at main modality to communicate between various organizations. In the wide world the health systems are in crisis situations. Either in the form of public or private medical assistance, the populations confront the aging phenomenon, so that the health expenses reached to an unprecedented level, the financial pressures being felt on the contributors, or the result is the diminishing of the quality of the medical service.

Fundamental changes, that happen in the way the medical service is administered, can be found in the

health state of the patient and implicitly in the cost of the human capital, so that the health systems must be centred on the patient. This change is possible through technological progresses, having as an effect the reduction of the costs of medical care.

The health care organization, placed in an internal and international environment, dynamic and unpredictable, in order to survive, must have the capacity to notice the transformations appeared, the opportunities to adapt to the requirements of an environment which is not always favourable.

If it will know how to value the change, to adapt to the environment in which its sources coexist (patients, suppliers, finances, technologies), then its success and performances certainly become a reality in a society based on knowledge.

TIC solutions in the health industry

In continuous developing, the information and communication technologies (ITC) fundamentally changed the nature of global relations, the opportunities for economic and social development, transformed the whole world in a global network of individuals, organizations, schools and institutions, which communicate and interact between them through a variety of channels. *The explosion of this global network technologically mediated produces a world in which anyone can virtually benefit from the advantages of the Digital Integration (*http://www.cid.harvard.edu/ciditg).

The most inciting subjects in the field of health refer to adopting TIC solutions in the whole health system by implementing the correlation and validation applications of medical data, the reporting applications, the computerised management of the insured, the electronic health file of the patient or the unitary and coherent administration of medical resources. The resolution of these aspects, with great social impact, is in the spotlight of the experts in the development and implementation of informatic solutions.

The ongoing process of collecting and using standardized information to assess progress towards objectives, resource usage and achievement of outcomes and impacts. It usually involves assessment against agreed performance indicators and targets. In conjunction with evaluation information, effective monitoring and reporting should provide decision-makers and stakeholders with the knowledge they need to identify whether the implementation and outcomes of a project, programme or policy initiative are unfolding as expected and to manage the initiative on an ongoing basis. (Dal Poz, Gupta et all, 2009).

If the health care organizations want to deliver qualitative, certain, efficient, efficacy and opportunistic health care services in order to optimize their work, the medical personnel must resort to the correct electronic registration of the patient's data in an open, integrated and interoperable system.

Thus, an important requirement in computerization is that physicians should accept computerization as an integrant part of their activity, fact that supposes the change of the entire organization of medical care.

The ways to reach the desired purpose are:

- ☞ *Systems implementation from the global and shared point of view for each patient;*
- ☞ *Placing the patient in the center of the information system;*
- ☞ *Encouraging the cooperation between professionals in the health field;*
- ☞ *Using the internet as a means of communication between physician and patient;*
- ☞ *Measuring and administering the activities being essential possibilities for modernization.*

The Internet – means of global and shared connection of the participants to the health system

A new hopeful society of information begins to develop, but more and more unorganized because it is known the fact that a deficit of knowing the possibilities offered by electronic networks is ascertained.

Suddenly, the communication frame widens, there are no more frontiers between organizations, people communicate with the entire world, people collaborate with new teams and new conceptions regarding society are discovered, the communication action being extended to a planetary scale.

If the Internet offers the access to impressive information sources, the huge informational device formed of millions of Web sites, multiple forums, numerous sites of computerized files, new virtual libraries, I can say that never did human kind benefit from such a richness of information, data and documents.

But there is also the risk of a big failure in the field of informing the individuals about information and especially about information connected to health without knowing their interpretation.

According to a study made by the professor Thomas K Houston from the General Division of Internal Medicine of the University of Birmingham from the state Alabama, USA, *very few persons used the Internet from a portal to communicate with their health suppliers, most of them using free information connected to health using search engines after a key on the Internet, without consulting online the specialized supplier of medical services. Thus, professionals in the field of health should be aware of the fact that their patients with a precarious health condition are among those who used the internet for health information* (Houston and Jeroan, 2002).

The impact of the Internet on the society will depend on its capacity to administer very well the favourable effects of the new instrument, already existing through "intelligent agents, robots or search engines of any type which are able to skim almost instantaneously millions and millions of documents" (http://www.info-portal.ro).

And because the information circulates smoothly on this world cloth of sites named Web, the organizations must rethink their future and structures in front of the evolution of the Internet.

For the patients`access to specialized medical information, health virtual networks are necessary which should connect the professionals in the system, so that the services cannot exist or cannot be developed without rapid and safe methods to exchange information, and the development and efficiency of electronic public services bring benefits both at public level (administration, health, education) and private level. (Bălan, 2008a).

Starting from the fact that only 16% of the general physicians have access to the Internet from their medical office, that only 5% use the Internet to interchange medical files of the patients, it can be said that the weak penetration of TIC in the medical sector (33% of the clinics have access to the Internet) is mainly due to insufficient budgets, having negative consequences on the efficiency of treatments, quality of medical services and communication between organizations of medical assistance.

According to the CE report, in Romania only 22% of the general physicians use computers to make examinations, and for diagnoses and recipe prescriptions the computer is used only in 11% of the cases. In comparison, the average of UE shows that about 66% of the European physicians use computers to make examinations". Romania is one of the countries positioned at the back. Thus, among the family physicians in

Denmark, the Internet with broadband has a penetration of 91% towards Romania with only 5%. Another statistic of this report shows that 2% of the primary physicians in Romania communicate through the Internet with laboratories, 1% with hospitals, clinics and pharmacies and only 0,3% with patients, as a whole these numbers are once more the smallest in the entire European Union.

"The volume of medical knowledge had and still has an explosive evolution. If at the beginning of the XXth century there were traced 3.000 affections, today their number exceeded 10.000. Each year minimum 300 new medicines appear, and the number of those currently used exceeds 10.000. The number of medical terms that a physician must know is of about 250.000, and the specialists must know over a million medical facts" (http://viorelciobanu.blogspot.com/2009/05/informatica-pentru-nursng-note-de-curs.html)

The Information and Communication Technology can facilitate the storage, the recovery and optimum use of medical data, information and knowledge, necessary to take the best decisions.

More than ever, the administration of medical information through the modern information and communication technologies needs instruments in order to control processes, to take decisions and analyze scientifically the medical knowledge (Shortliffe,1984).

The information administration implies the entire qualified medical personnel because it refers to the cognitive processing of information, to the communication of aspects of medical practice, to the technology that supports these tasks.

Today, a new generation of communication systems and instruments can be made available for physicians, managers and professionals in the health system in order to take decisions (Greenes and Shortlife, 1990).

"The medical informatics contains theoretical and practical aspects of processing and communicating the information, based on the knowledge and experience derived from the processes in medicine and from health care." (Van Bemmel, 1984, pp. 175-180).

The information and communication technology gives the possibility to professionals in the system to take the best decisions regarding the way the patients are aproached, the way treatments are defined, selected or elaborated. It is the only way to generate, outline, apply and share the medical knowledge (Coiera, 2003).

Every decision, clinical action, the choice of any treatment and of an investigations depends on the availability of information and the efficiency of their being communicated.

Enrico Coiera, in „*Informatics skills*"- the second part of the book „*Guide to Health Informatics"focuses on the idea that taking a decision can happen when :*

- *All the necessary available information have been put together using information and communication instruments;*
- *The best alternative was chosen in order to select a treatment;*
- *The decision is based on scientific tests, on the individuals desires and needs;*

Using applications on Web platforms, the structuring of the information focused on the electronic registration of the patient is the most handy modality to transmit the information through the communication channels between transmitter and receiver.

It is important for the organizations of medical assistance to find essential information of clinical practice to permanently fill the gaps of medical knowledge regarding each individual, ao that all these information available be

used in the management of a patient`s disease.

The management of a patient`s disease refers to "the coordination of a set of interventions of medical assistance and the communication to patients that the efforts of self care are significant" (http://www.dmaa.org/definition.html), having as a purpose the improvement of the patient`s health condition thorugh continous evaluation of the clinical results.

The objectives of disease management are those of administering medical affections in time, in order to improve the results, lower costs, the support of the patient-supplier interaction and its monitoring.

An efficient system of disease management will significantly reduce the medical and administrative costs, will enrich the physician – patient communication and will raise the quality of the medical service.

But the implementation of the information technologies in this field supposes high costs and a long implementation cycle, so that the diffusion through internet of an informational potential which could support patients eliminates many obstacles by furnishing flexible Web applications, with shorter cycles of put into practice (Demeris and Eysenbach, 2002).

The Internet technologies must allow the connection of the patient to all the suppliers of health services (hospital, ambulatory), must facilitate communication, the information exchange and the collaboration between patients and suppliers of medical assistance.

The electronic medical files based on Web services represent another way of consolidating the communication between the parties interested in coordinating the care, as well as the accessibility of the patient to the electronic health record, in order to improve the health condition through new ways of communication (Personal Digital Assistant (PDA-s)), mobile phones.

The mobile medical technologies, integrated in an IT infrastructure, serve to increase physicians` efficiency and professionalism, helping them to think, to research and take critical measures more rapidly, bringing a vast volume of relevant and indispensable information (Bălan, 2008b).

Information technology can bring a vital contribution to the organization of the health care process, which must be based *on the concept of e-health, on the use of electronic communications at all levels of the health system* (Bălan, 2008b)*, and the potential of the e-health technologies* to supply services of quality and efficient medical assistance has as an effect the reduction of distance and time between various actors involved in the health system" (Bălan, 2008a).

This way, the medical system becomes safer, more efficient. Having the information and the data base available in the network, the physicians have permanently available the patients` data, being thus easier for them to take a medical decision about a patient's treatment or when its file is also available for other physician, the reduction of losses and of an excellent work flux being assured.

PDA-s together with VOIP (Voice over IP) applications reduce a great amount of the dead time, they assure a communication in real time, fewer medical and human errors. The traditional human effort to treat and cure various diseases will be improved and will evolve with the help of digital equipments and artificial intelligence.

At the same time with the development of medicine, (finding new types of drugs and new branches like the genetic medicine), the specialists` effort to find the symptoms of a disease and to find the antidote, will be replaced with the collaboration between the

medicine of tomorrow and artificial intelligence.

Certainly, the new technologies in the ITC field play a more and more important role in the field of health, remodelling the medical practices, improving the competences of physicians and the life conditions of patients for the diagnosis and adequate treatment right from the first moments.

"The localization and supply of information about the health state in real time can lead to the optimization of the decisional process and, on the other hand, the fact that we can transmit a few parameters of the patient's health state, can put us in front of the access to complete information which will certainly influence in a positive way the medical act" (Bălan, 2008b).

The centre of the health informatics system is not necessarily the patient, but the interaction between the patient and those who supply his care, which offers the possibility to each specialty physician to access all the available information about a certain patient, in the sense of being as efficacious as possible during the care process and of course, this condition is especially important when the emergency services are involved (Bălan, 2008a).

Taking this into account, *the global record in a patient's chart* is the central piece of the informatics system, and interoperability is a paramount requirement.

Interoperability means *the ability of communication and clear, reliable, real data exchange* and also consistent with various technological systems of information, software applications, networks in various states and data exchange like those of clinical or operational purpose, must be preserved and unaltered (Bălan, 2008b); it is the possibility that the information in an application be able to be used by other applications. "*It can allow for instance, to a symptom in a file of the patient to be directly "served" in an expert system for assisting a decision and to an European epidemiologic data base*" (Bălan, 2008), and the components of the medical registration have to be homogenous (Katehakis, Lelis et all, 2000) to allow their integration into the patient's electronic health file.

Integration supposes the interconnection of several different, specialized applications, in a wider system, allowing the synergy between various levels. As examples can be considered the integration in a hospital computer system of medical charts from various specialties (neurology, endocrinology, obstetrics), services (radiology, biochemistry) or the interoperation within a network of primary care and the hospital systems from various regions, with further connections to a network of insurances and damages (Bălan, 2008b).

The Patient's Health Electronic File generates the efficiency and performance of medical services

Health protection must be a cooperative and collaborative process involving medical staff with various qualifications (physicians, nurses, pharmacists and other professionals) who, among other various activities, use health files, write abstracts of the chart, letters to the patient, etc. Some of them make tests and analyses, register the results in the file and sign, others execute specific treatments or are preoccupied with the mental and social state of the patient and introduce information related to him.

In this climate of continuous change, I consider that the correct use and the maintenance of the health file should be the task of the clinic physician responsible for the patient. The clinic physician writes entirely some parts of the health file (clinical history, the diagnosis logic, the clinical examination and the state of the patient, recipes and prescribed treatments, diagnoses and abstracts of the chart). Other parts are

only partially written by the clinic physician (results and reports of the examinations and consulting, like: the results of laboratory investigations, protocols of radiographies and of other imagistic investigations, reports of other clinic physicians, dietetics physicians and social assistants, surgical details, like the *care plan and observations of the care team,* for instance of nurses).

If the role of the physician is decisive in the practice of establishing a diagnosis as precise as possible, in interpreting data, laboratory information and a treatment way as adequate as possible, the computer systems with high precision and use degree in distinguishing the most various ways of manifestation of a symptom, will obtain *a more efficient use of time, the hasten of the act of establishing the diagnosis, as well as a qualified and opportunistic intervention of the specialist.*

The only instrument that administers in a performant and efficient way the information necessary to the physician is the one that contains data related to the patient's history and those regarding past and future investigations, information stocked and processed by the *Electronic Health Record of the Patient.*

It is noticed that information concerning clinical investigations are few, others than those of identifying the patient, so that it is necessary that the clinical information written in the past, the unpleasant and laborious clinical transcriptions be recorded electronically, be archived in an adequate manner so that all this information be found, be useful also to other clinic physicians in taking correct decisions to establish the diagnosis (Bălan, 2008b).

Today's medical practices will not survive without the global electronic recording of the information connected to the patient's health, to his medical file and will not survive without software solutions for the management of documents in order to reduce the work volume, to eliminate paper, to improve the flux of information and the care given to the patient.

The rapid access to digital information collected in the health electronic record of each patient, the high degree of availability of documents in electronic format will raise the quality of the medical act, will transform the medical office in a *virtual organization* in which the medical service can be offered from a distance. The patient can receive its medical evaluation from the curative physician in the form of graphics or diagrams in various time periods through a simple remote from home, from the portal on which he previously authenticated himself with the user name and password.

If the organizations of medical assistance add to this administration solution of the health electronic file also bases of knowledge related to the medical practice and treatment plans, then I can truly say that information and communication technology will continue to play an important role in the raise of efficiency of the medical service.

The software solution to manage the health electronic file brings efficaciousness if the information and medical decisions connected to patients would serve to the thousands of physicians from all the medical specialties in the entire health national system.

The Online Virtual Clinic

If information mastering is the pin of the success of the XXIst century organization, because from the point of view of the consumer "*the value of services that we buy always depends on their degree of sophistication and on the information system that they put on profit, to the detriment of the materials and amounts of necessary energetic resources*" (Ettigoffer and Van Benden, 2000, pp 273-274), the same way the value of the virtual service will depend on the sophistication degree, on the

information and knowledge system that it contains.

A virtual service can only exist in a virtual network, “formed of one or more virtual machines, configured to access the local or external resources of the network” (Microsoft TechNet, 2009).

The virtual organization is "a group of individuals who interact through independent tasks, guided by a common purpose”, who “work in the space, time and organizational borders with links consolidated by communication technologies on the Web” (Lipnack and Stamps, 1997, p.7).

The virtual organization is an organization geographically distributed whose members have a common objective and a long term interest, who use Internet technologies in order to communicate and coordinate their activity to a common purpose. Very little is known about the way, in which these organizations function, that the virtual organizations, besides the fact that they use the information technology to communicate, are decentralized and non-hierarchical (Ahuja and Carley, 1998).

The performance of virtual medical services given to patients can be evaluated through the health state, through the raise of the satisfaction degree of patients.

The online virtual clinic is a virtual organization that manages a *network of information and parallel relations where the patients (clients) and the suppliers of medical services (physicians, hospitals, clinics, medical offices), the teams of the entire health system coexist in order to create virtual medical services.*

Realized based on an architecture oriented towards services SOA (Services Oriented Architecture), with resources distributed on the Internet, projected by using development environments which could assure the efficiency of the teams of technicians, programmers, analysts, integrators as well as the simple, safe use, at the level of the expectations of health professionals and patients, who need not know the details of the implementations, *the interoperable, integrated, standardized and open health systems,* will be able to offer to the end-consumers of medical services, as well as to professionals in the health field quality, efficient and real time medical services (Bălan, 2008a).

Starting from the necessity of the patient’s Health Electronic File, we noticed that the health system should be reconfigured from the base, decentralized and interconnected to the other European systems, adapted to changes produced by the society of knowledge. For this purpose, the concept *Online Virtual Clinic is necessary to be considered by all the organizations of health care,* by the whole health system.

The Online Virtual Clinic (CVO) presented in figure 1, in my vision, is a system of computerized management destined to all the medical organizations, which offer to patients the possibility of following in real time the evolution of their health state.

Basically, CVO keeps the record of patients, personal data, analyses, services of family medicine; it can offer permanent and personalized access to data of major importance for the substantiation of medical decisions, like the diagnosis of the patient, the reason of the hospitalization, the evolution of his disease, the integral set of medical analyses made until a certain moment.

CVO can function on a Web platform like this:

- The physician introduces the personal data and analyses made by the patient using a secured web portal;
- Another physician of the same clinic introduces another set of medical analyses;
- The medical data are saved on a central server;
- A physician from another clinic has the possibility to visualize the medical

history of a patient using the same secured web portal.

Because a portal offers at least four essential services : search engine, e-mail, links to other sites connected and personalized content, the most efficient communication solution between physician – patient is the portal because it holds more facilities (chat, members list, free downloads).

In order to access the CVO portal, the physician needs only a connection to the Internet. CVO preserves all the medical data of the patients on a central server and the access to these data happens with the help of a password. Each office / organization of health care can have access to available analyses, can search and find in real time relevant data regarding the health state of the patient, according to various criteria: surname, first name, reason of hospitalization, date of hospitalization (the information is distributed).

This means that any medical staff member from any hospital could access this system and could find in real time information about a certain patient. Let's suppose patient **X** makes a series of medical analyses at **B** hospital, of **O1** city and after a period of time he makes other analyses to **A** hospital from **O2** city and, obviously, the patient has already forgotten what analyses he had previously made. In this case the physician at A hospital from **O2** connects to the application, searches the patient according to the criterion which is most handy to him and finds what results did the X patient have at the analysis made by **B** hospital from **O1** city, without being forced to repeat it through clinical exam, with the possibility to add observations to the patient's electronic chart, to modify the analyses already introduced in the patient's file. Moreover physicians can collaborate within this network, in permanent extension, in order to find some treatment solutions that, for many patients, can prove to be vital.

Let's assume that a certain physician wishes to be notified about affection or about the evolution of a patient, on whom he needs more information. He introduces in the system an alert with the name of that particular affection or the patient's personal numeric code; if another physician introduces in the data base a patient with the affection defined or a patient with the name defined, the physician that introduced the alert receives an email and an internal notification in this sense.

The Online Virtual Clinic can be seen as a virtual organization from the health system with more specialties, through which patients can benefit from online counselling, from various medical offices. It is needed that the information which describes problems, the symptoms that are introduced in the system be in a standardized form, in the form of a quiz.

This ***virtual clinic***:

- Can facilitate drawing the attention to the patient about his health state through messages, using his informational system which permanently evaluates the parameters of the patients that contribute to the patient's information;
- Can offer the patient the possibility to make and appointment for a medical examination without leaving home;
- Facilitates the communication with the medical staff;
- Can offer graphics and reports about the evolution of the laboratory analyses;
- The medical registration of the patient in electronic format and the entire content of the Health Electronic File can be available to the professionals in the health system.

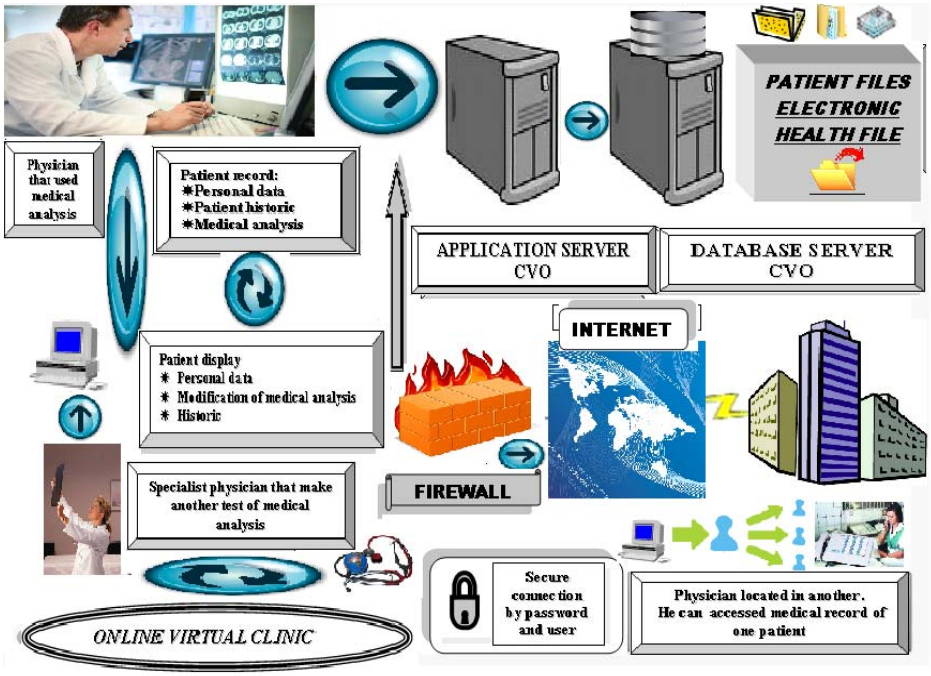

Figure 1. Modern management system for the health care organizations - Online Virtual Clinic -

All these facilities bring important contributions to the ***quality of the medical service***, so that the objective of this clinic is to supply health services in conditions of specialty ***virtual medical assistance*** for a large area of medical specialities: haematology, cardiology, radiology, endocrinology, dialysis, plastic and reparatory surgery, neural surgery, psychiatry, etc, but also rehabilitation after alcohol problems, the monitoring of the old people at home, or general medicine.

CVO is characterized by ***interoperability*** at European level, facilitates the ***information exchange*** between the participating regions, and the suppliers of medical services of Romania will be able to communicate in this ***virtual environment*** with physicians from an European hospital by accessing the same virtual platform on which the health electronic records of their patients will also be present.

Besides the supply of assisted services, CVO has as objective also the monitoring of the chronic persons at home, the rehabilitation after problems that may appear any time for the chronic patient, being a modern platform of interoperability for e-health solutions.

The impact of this CVO will directly reflex in the quality of medical assistance given to patients who are especially in difficultly accessible areas from the point of view of specialty services. Through telemedicine, decisions related to medical procedures can be taken in a short time because there are extreme cases of emergency in which time is a determinative factor.

This way time is spared, promptitude is offered and substantial economies are made from the health budgets, money that can be subsequently directed to other area of top importance for the sanitary system.

CVO can be used by specialty physicians in hospitals, who can benefit of support in taking certain critical decisions or in rare clinical cases, general physicians that can establish a difficult diagnosis or can decide whether a patient needs specialized assistance, but also to medical nurses. In the *center of this system are the patients*, they are the ones who benefit through the rapid and less expensive access of high quality care virtual services, regardless of the location. *By using telemedicine services* the work fluxes in the hospital units are optimized, the costs of medical care are reduced, efficiency raises and at the same time with it the productivity of the organization.

The Online Virtual Clinic represents an interoperability, telemedicine and teleconsulting solution – in the sense of accessing the information in the health electronic record of the patient wherever a European citizen is at a certain time. We are talking now about globalization, about a European Union in which borders disappear and in which the citizen moves from one country to another unhindered, but he also moves with the health problems he has.

The problem of the patient of Romania is totally unsolved, regarding the availability degree of medical information about him. If we consider the previous example, the X patient can be included in a different scenario (Bengulescu, 2007) and this is:

„The **X** Patient is a 50 years old woman, employed at **Y** company; she suffers besides of a chronic disease of: ischemic cardiopathy and affections of the digestive tract. The respective patient has a private health insurance at a **Z** private clinic, but she was also hospitalized in an **A** hospital for the cardiac affection and in **B** hospital for the digestive affection.

A week before, **X** was hospitalized in **B** hospital, at discharge she received treatment for the cardiac affection, a **C** medicine was prescribed to her, medicine that also has some counter indications, fact that obliges the **X** patient to make periodic laboratory analyses at the **Z** private clinic.

The **X** Patient is registered in the medical portal of the three organizations of medical care (Z, A, B).

Saturday, the patient has a symptomatology similar to a biliary crisis so that she takes the decision to consult the medic by logging in to the medical portal using a medical electronic card from the **Z** private clinic, but she encounters a message that brings to her knowledge the appointment date for a new laboratory analysis **A1** from **Z** clinic, and in the message inbox the **MI** physician from **A** hospital communicates to her the **A2-A7** analyses made before discharge, which prove to be good.

The **X** Patient continues the appointment process for a gastroenterological examination at **Z** clinic, where she pays the medical insurance. She activates the module on the portal which offers her the appointment of the examination; she selects the day, the hour, the name of the physician **M2** from a rolling list and adds in the symptoms field a short description of the symptomatology.

At the same time she transmits to the physician **M2** that she was hospitalized in the past in **B** hospital for a digestive affection, attaching to the message all her medical information connected to her hospitalization in **B** hospital. Of course the physician **M2** will read the entire medical data (medical history) of the **X** patient registered in **B** hospital.

Returning to Saturday, the **X** patient must take a **D** medicine in order to attenuate the biliary crisis, so that for her safety she checks the counter indications and the list of her medicines for the chronic affection: ischemic cardiopathy, which contains the **C** medicine prescribed by **A** hospital. She sends all this information to a decision module, from which she receives the

message: "*The combination between the two medicines C and D determines internal bleeding*".

Her decision is a favourable and opportunistic one due to her subscription on the portal of the three organizations of medical assistance.

Thus, technology, the collaboration between the health care organizations (in our scenario A, B, Z), the information exchange, the transfer of opportunistic medical data and knowledge must be the support for quality medical services, so that the health care organizations will have to transfer their *services online, in real time, observing a standardized informational architecture*.

Conclusions

The Online Virtual Clinic is a solution of online medical services management, in real time, which uses communication Internet technologies, keeps all the medical data, information and knowledge related to the patient, the clinical information written in the past, the unpleasant and laborious clinical transcriptions in electronic format, adequately archived and apportioned by all the professionals in the system who give health cares to the patient.

Romania lacks standards for collecting, stocking, communicating, processing, analyzing and presenting the health information and the challenges of ITC application in the health care system should not be underestimated, health being without a doubt one of the most if not the most complex sector of economy, in which the number of various types of transactions (the needs of the patients, the interactions, the medical services) is very big.

The implementation of the applications of the information technology will need behaviour adjustments of the patients, physicians and organizations and the Internet will rapidly transform many aspects of the society and many processes connected to health. The level of the technologies of collecting and distributing medical data using applications of the type Health Electronic File combined with interconnection architectures based on the access to the Internet must be reached in Romania.

The concept of online virtual clinic will change the structure and organization of medical services that the Romanian health system promotes, they will succeed in reconfiguring the health system through the implementation of the Internet technologies, in a way based on the services oriented architecture on a global market.

The use of telemedicine services will optimize the workflows in the health care organizations, will reduce the costs of medical care, will raise the organization efficiency, while the medical service will prove to be certain, centred on the patient, efficacious, opportunistic and efficient. If the system of medical services will use the new information and communication technologies and the flow of information and medial knowledge is apportioned, with unlimited access to their own medical information, then patients will try a safer system, more trustworthy, more receptive, more integrated and much more available.

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