

# An Initial Proposal for a Web 2.0 Information System that Supports a 360° Customer Loyalty Assurance Process in Private Healthcare Organizations

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**Abstract.** This study translates how the potential exists for ICT and Web 2.0 to promote and improve the quality and efficiency of the supply of health services. The segmented and personalized access to individual clinical records is considered in the context of basic support information which simultaneously facilitates an initial screening by a health professional, to all those who fit in a universe of clients and patients of Private Healthcare Organizations - PHO. The context is of excellent customized health care which builds trusting relationships with the target market. The project does however recognize barriers to this change namely by making the health system more transparent clinicians who hitherto have gone mainly unquestioned and unnoticed will subsequently possibly be subject to more scrutiny and possible judicial action in case of mal practice. Nonetheless, with this work we aim to present an initial position relative to the need for the existence of information systems which support the process of creation of customer loyalty in private organizations delivering health care services.

**Keywords:** Web 2.0 · Information system · Healthcare · Customer loyalty · Private healthcare organizations

## 1 Introduction

The Organization for Cooperative Economic Development, in a study done on information and communication technology in the health sector, states that if implemented efficiently, information and communication technology may facilitate and promote an improvement in the quality of health services delivered, as well as increasing the security in patient attendance while diminishing the costs due to the elimination of health care considered unnecessary [1, 2]. On the other hand, the health sector is challenged constantly by new surgical techniques, new medicine and therapy and surgical procedures, which are more modern, and require investment, updating and training with

regards to professionals in the sector, it still further having to be ensured that medical processes are followed in conformity [3].

Health is a business of organized information, based on trustworthy data, and dependent on professional knowledge [4, 5]. The difficulty in the obtaining of resources, allied to the aging of the population and tendency for chronic diseases to prevail, challenges health organizations to above all optimize their current resources. So, resource management must be considered, as well as quality and efficiency, the quality of information and the integration of information systems. Gradually the importance of technology in this sector will lead to important advances. Hospitals, in turn, face very significant pressure to control costs, improve the quality of their service to the customer, avoiding wastage and, at the same time, adapting to new business models and developing health service in general focused on the patient/customer. In view of these pressures, hospitals seek to focus on business processes which are considered to be more important, using information and communication technology to promote agility [6, 7]. The adoption and use of information and communication technology in health care has been gaining relevance over time and this growth results from the fact that its use brings with it a compromise for improving the quality of health assistance while at the same time increasing the security of patients [8].

With this work we aim to present an initial position relative to the need for the existence of information systems which support the process of creation of customer loyalty in private organizations delivering health care services.

## **2 Web 2.0, Social Media and Health Data**

### **2.1 Background**

Currently, worldwide, organizations exist that want to move forward to the digitalizing of their businesses. In reality, for some of the executives of these organizations, the issue is essentially about technology. For others, digital is new way to get connected with current and potential customers. And still yet for others, digital represents an entirely new way to promote and make business happen. None of these definitions is necessarily correct. Albeit, the different perspectives are oftentimes responsible for tripping-up leadership teams, due to the fact that they may reflect some lack of alignment and strategic vision about where the company needs to go in this domain. This often results in fragmented initiatives or mistaken efforts which lead to the loss of opportunities, slow performance, or even false starts. Adopting and integrating the digital era requires being open and re-examining all of the ways of doing business while simultaneously analysing the whole value chain of the firm. For some organizations, this option may represent the opening of new frontiers making possible the development of entirely new businesses in adjacent categories; for others, we may be talking of the identification of new business niches in the context of their own sector [9, 10].

On the other hand, we also witness that consumers are confronted with more opportunities and more information about products and services and very quickly and increasingly more informally, with the referred-to information coming from diverse sources which can be trustworthy or not, depending on each case [11]. Whether we are discussing

a good buyer of luxury products or a controlled and demanding consumer, both currently spend much more time doing research and analysing before arriving at the decision phase. In the social media environment, we today live with an immense amount of denominations, such as for example “social bookmarks”, “hashtags”, and “tag clouds”, which not only represent new words, but also emerging concepts and which are different from everything that was accepted as normal for organizations and users of Web technologies [12, 13].

We are thus naturally living in a digital era which is ever more dynamic. However, for many it is a question of being a confusing jungle and whose structure is everything but clear. Social networks and technologies transformed the way we communicate, and effectively modified society and the promotion of health, altering messages in the context of communication of one to many, from many to one, but also from many to many, at the same time that they reach all in real time [14]. Observing this theme from a health perspective, there are several international reports which reveal data about the behaviour of users of social networks (Facebook and Twitter currently have more than 1.5 billion users who share information on a daily basis), their diseases as well as about their attitudes concerning health, the perception and quality of health services and their information needs about health [15].

Even if this phenomenon is increasingly becoming something massive, the majority of user health data of the so-called social media users are stored, analysed, and oftentimes passed on to third parties, without the consent of users/patients. It is still curious that when in a hospital context these same patients present various fears relative to the use of their data by the same organizations which are giving them health care services, mainly fearing a violation of their privacy and indicating a significant discredit of the effective need to have data for medical and scientific research purposes [16]. On the other hand, some more recent studies indicate that, in specific circumstances, a substantial number of users exists who would consent to sharing data from their social networks with researchers and specialists. These indicators thus suggest that social networks can represent a promising path in the exploration of how patients conceptualize and communicate their specific health problems. Up until now little is known about the individual and social acceptability for the sharing of data on social networks for individual purposes of public health or for medical research and even for the building of a “Digital Health Data Bank” (DNA Banking) [17].

As with all communication pathways, social networks have advantages and problems, allowing for new voices to emerge in the social sphere, so that individuals may have such a significant presence on social networks, much as with big brands, researchers and rulers of nations. The openness of this double communication as compared to newspapers and articles gives the opportunity to connect and interact as if we were in a conference where we may directly question the researcher and the scientist.

Information may easily become available in multiple languages and adjusted to the characteristics of the group and in a low-cost format, in which case this becomes very important due to the speed of distribution, reaction and commentary which can contribute positively to the search process through interdisciplinarity. On the other hand, however, it may contribute negatively due to a loss of control, due to its democratic

nature, being able to rapidly distribute information meaning also that incorrect knowledge may be produced and shared.

Some health professionals already use social networks in order to evaluate public opinion, population studies, and the dissemination of information about health. Still, in recent studies it is possible to verify that only a small minority is currently interested in this professional space. Social networks are seen by most as being more useful in the sharing of information than in obtaining it [18]. The capacity for social networking through social networks provokes alterations in society and events associated to the Arab Spring were evidence of this, demonstrating very well how ideas can spread virally by and amongst the population without the need for personal contact and using social networks as a primary vehicle for transmitting messages.

A recent evaluation about the use of social networks by local health departments using mainly one-way communication from departments to the public shows that dialogue and involvement/commitment are growing [19].

Looking at the phenomenon of social networks from the perspective of the life cycle of a product (introduction, growth, maturity, and decline) we may infer that these are in a growth phase, so on their path to maturity we will still see much change and innovation for us to live through and experience. However, the health sector and in particular PHO should maintain special attention aimed at the opportunities that these platforms present in the context of developing one's business, naturally involving one's network of customers (current and potential).

The democratic nature which social networks present must be taken advantage of and used to its potential as concerns structural characteristics which create a new vision of digital or virtual democracy. On the other hand, it is essential that all types of security mechanisms and solutions, as well as rules for interaction and relations in this new world, be promoted, which will take on the form of traffic signage, much due to the necessity to serve the purpose of harmonizing this immense relational platform. In the context of the evolution of Web 2.0 in the core of PHO much ground needs still to be covered and the evidence of the advantages and benefits of social networks may above all bring a useful sharing of information – useful to the customer/patient, with all of the rigour and ethical and deontological criteria which needs to be in place, such as these elements help define the frontier in the process of health communication.

## **2.2 Perspectives on the Use of Web 2.0 in Healthcare**

So as to make possible an analysis of the most varied perspectives about the utilization of technology systems associated to Web 2.0 in the health sector, we did a scientific literature review related to the theme as well as a systematization of its contributions.

In agreement with Cimino, Patel and Kushniruk [20], clinical information is generally fragmented along the treatment process in the various locations where it occurs, creating obstacles from a clinical/therapeutic point of view, from a research perspective, as well as concerning the public health impact. Electronic medical records and the Internet made possible a technical infrastructure in which clinical data is longitudinally registered which can be integrated in the various locations of treatment. According to the authors, even if the integration of information and communication technologies

(mainly of a Web nature) with the activities and processes tied to the providing of health care is more essential as time goes by, a set of variables is necessary relative to this integration concerning: comprehensibility; accessibility; interoperability; confidentiality; accountability and flexibility.

The existing literature also presents examples of usage of information systems for the management of patient medical records and in this way making information accessible in several locations, to a number of professionals and to the patient him- or herself. In agreement with Barrows and Clayton [21], the technical challenges related to the implementation of an information system to manage medical records, despite being technically challenging, and having stimulated the enthusiasm of patients, the same does not occur with, in general, the doctors, as the typical implementation of these systems is assumed as being generic and inadequate to the specific reality of each clinician or health care providing unit. In sum, the clinicians present themselves as being generally concerned with disinformation and confusion relative to the results of an information system such as this. However, this same study reveals that Pandora's Box was previously opened by laboratories which give online access to patients so that they may consult their analyses results. The same authors assumed also that a set of questions exists to be taken into account for the implementation of an information system to manage medical records: (1) Will the patients be able to utilize the platforms?; (2) Will the patients be able understand and interpret their results?; (3) Will this usage affect the doctor-patient relationship; (4) Will the architectural support of the platforms support the rapid integration of the applications?; and (5) Will an adequate but not excessive security be provided?

When we discuss the access of data by patients, security appears as a primary discussion theme due to confidentiality reasons [21, 22]. The patients to whom access is given to their electronic clinical records via the Web use them for ever longer periods and feel that this type of access may increase their understanding of their health and improving also how they communicate with health care professionals. These advantages suggest the potential of these platforms of reaping benefits from the exchange of information between doctor and patient, resulting in a better overall communication and negotiation process.

In agreement with Kellermann and Jones [23], more informatization in health care has been useful in the increase of guideline adherence, the reinforcement of vigilance of pathologies and the diminishing of medication errors. The question of privacy regarding information acquired in the treatment process is necessary for many relevant reasons – economic, psychological and social which could damage the patients when it is not protected. With well-defined precautions or restrictions digital clinical records and their subsequent sharing may include very considerable levels of security. The authors indicate that various trade-offs exist between accessibility and security of electronic medical records as compared to paper records. The goal of privacy of information raises issues of control of access (authentication and authorization of who uses the information) and the application of cryptographic protocols to transmit and store clinical data. The goal of making data available, raises questions concerning the trustworthiness of the platform, control of access and backup mechanisms used.

### 3 Research Opportunities

After the above analysis of the existing literature about the adoption of technology and information systems associated to management and electronic medical records, it was possible to verify that even if the advantages were recognized as concerns their integration with health care services, these systems are still not interconnected with the existing infrastructure. The information systems associated to the health sector only now are starting to develop some interoperability, even if this characteristic may represent a problem as even when two organizations acquire the same I.T. Health System, the degree of local customization is so extensive that the systems cannot communicate between themselves without interface costs. This leads to the progress of interoperability being so accentuated that it leads to speculation and the opposition of the sales people as concerns operability [24].

Are the modern technology and information systems in the health sector largely adopted? The answer continues to be no [23, 25, 26].

There is a big difference between the small hospitals in the provinces and the non-school hospitals and the school-hospital units in the big urban centres [27]. The experience with the diffusion of technological information in other industries demonstrates that the value of this content increases in direct proportion to the number of people who use them, which is the network effect which also occurred in the past with the telephone and which recently was reaffirmed by the rapid proliferation of social media applications.

Today people can quickly access and manage their online information about their personal financial situation, however this is not possible with the majority of electronic health records. To achieve a true and competitive health market the locus of control of electronic health information must change to the patient instead of staying in the hands of an individual owner. The use of technological information systems should facilitate the work of clinicians using similar interfaces. For example, automotive manufacturers offer a large variety of brands and models, but there is an important control in so far as the customer is able to drive any vehicle without instructions [28]. The I.T. Health



Fig. 1. PHO integrated services model for delivering a 360° customer service.

Systems cannot be different as regards the ease of use of this information technology [29].

The implementation of health information systems will be a significant benefit, reducing the barriers between doctors and patients (Fig. 1). Thus, a total interoperability, centred on the patient and ease of use of this type of system are critical requisites, but insufficient to ensure its potential [17, 20].

## 4 Proposed Methodology

Naturally the exact definition of the methodological considerations is a fundamental issue in the development of any research project. We do know, however, that when the definition mentioned above is done according to high quality parameters and scientific rigour, the execution of the activities which the researcher addresses occurs in line with the best practices developed in the knowledge area [30, 31].

As a way to focus on the research opportunities previously identified a methodological approach was defined in phases and aiming at specific objectives, which should be truly attainable and measurable. As such, and as concerns this present project, we foresee the use of a mixed research methodology [32, 33], which is seen to be the most appropriate as it will allow for the solving of two main problems: a rigorous audit of the necessary requisites to fulfil the proposed customization objectives, for the PHO as well as for customers/patients/health care consumers, with the necessary identification of the implicit needs in this process.

In practical terms, the research project will start with a qualitative approach, represented by a study using the Delphi Method. The research team will try and identify the more relevant list of characteristics and factors not only for the information systems which support the loyalty process of customers in private health care organizations as a technological solution, but also regarding adoption and incorporation across the board in the functioning of organizations. Following this, a number of interviews will be performed with members of boards of directors and with technical, business, and functional management teams of Portuguese PHO so as to validate not only the results of the previous Delphi, but also to ensure a contribution by those who are really interested in a final solution, such as the one sought for here.

After this, and via a set of approaches supported by the Design-Science methodology, the components will be identified and characterized which should constitute an architecture of a Web 2.0 information system which allows for, in a 360° perspective, a loyalty promoting process in private health care service enterprises.

## 5 Expected Research Contributions

The organizational culture of hospital structures, in particular PHO, should integrate relationship marketing policies which dilute the frontiers between offices, services and departments. The patient, customer or consumer is very sensitive, due to his or her state of illness, but due also to the surrounding environment, and thus easily is aware of dysfunctional systems and actors who do not communicate effectively. The concept of



health service consumer brings a relatively recent opportunity to the market, considering also here that the PHO have a head start with regards to the installed public offering, due in effect to the consolidated investment in preventive medicine.

The better 360° customer loyalty and customization program performance of the PHO, is aligned with the subsequent improvement in the gains of the management and business processes of these sectoral health organizations [34, 35]. A strong increase in the customer positioning in the value chain of these structures of health care providers is witnessed.

From the perspective of the patient, customer, and consumer of health care, the recognition of advantages and benefits of Web 2.0 in the improvement of quality of life, improvement of health and life safety will directly link to the freedom of movement and the comfort of knowing that one's most precious gift is safe and well-informed – online, 24 h a day and 365 days a year.

As the health sector increasingly comes under attack, for on the one hand spending a tremendous amount of resources in developed but aging economies, while on the other hand customers, and in particular the millennial generation, become more technologically adept and efficient, information technology needs to bring a break-through in the quality of the health service offered. Indeed, we argue that it has to do so, it is only a question of time – and the sooner the better, for all of the stakeholders involved. What needs to be in place is a decentralized system where the end consumer has considerable power over decisions concerning what is, ultimately, his or her health care situation, regarding life itself. We do understand, however, that there are barriers to change. Clinicians do not like being evaluated and a more transparent system will make this possible, as they will come under additional scrutiny. At a time when lawyers in certain developed nations (e.g., the USA and UK) actively seek to win insurance claims for their clients, for clinical mal practice, we do understand the serious issues involved with making clinical information more accessible, but still see that it is worthwhile – given the greater good of providing for a better health care system, in which more lives are saved and better quality of life ensues.

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