

Designing a Framework to Develop eLoyalty for Online Healthcare Services¹

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Abstract: In an attempt to enhance their effectiveness, public health institutions are making a great effort to develop online health care services targeted to all citizens. The initial acceptance of these services by patients is important but their success depends on its continued use, that is, on patients' electronic loyalty (eLoyalty). In this research, an integrated model combining the Technology Acceptance Model (TAM) and the Seddon's Model is developed to test online health care services success from a sample of 256 healthcare end users. The results obtained suggest that quality perception dimensions (i.e. information quality and system quality) are antecedents of perceptual dimensions of individual benefits (i.e., perceived usefulness and satisfaction) and of organizational impact dimensions (i.e. eLoyalty). In other words, by promoting the idea that citizens can become more aware of health care services success and respond to them, they will benefit themselves and others.

Keywords: eLoyalty, satisfaction, technology acceptance model, health care, patient, information system success models

1. Introduction

Descriptive overview of the changes: In this version we have included a new section reinforcing the conceptual framework of the paper. In that section we use two concepts that will allow us to assess the value of healthcare services being provided to patients: organizational memory and exploitation of knowledge. Through these concepts we develop a framework to develop eLoyalty for online healthcare services. We have also added new contributions of this work and we have included new references to update literature review

In an attempt to enhance their effectiveness, public health institutions are making a great effort to develop online health care services targeted to all citizens. These services are more convenient to the healthcare end users because they save their time, require less effort from them and are more accessible. In addition, they offer faster methods of communication between health care professionals and patients. In this way, health care personnel can save patient support hours and can also be employed in performing other tasks. In short, the use of online health care services can lead to cost savings and patient satisfaction increments.

However, those improvements are possible only if patients use online health care services regularly, by integrating them into their daily lives. If their use of the services is discontinued, public health institutions would be wasting their limited resources. According to Bhattacharjee (2001), the initial acceptance of a technology is an important first step; however, the eventual success of the technology depends on its continued use. Hence, patients' electronic loyalty (hereafter eLoyalty) is the key for online health care services success. According to the marketing literature, loyalty is present when favorable attitudes for a brand are manifested in repeat buying behavior (Keller, 1993). Adapting that definition to the health care sector, eLoyalty can be defined as the favorable attitude of the healthcare end user (e.g. patients and carers) towards an online health care service that results in repeat use behavior.

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Despite the opportunities the health sector will offer as a result of the creation of eLoyalty, the fact is that health care providers have been slow to build eLoyalty to health websites largely because very few organizations are prepared to face this challenge (Brakensiek, 2002). For example, several state members of the European Union have already established the failure in the application of certain technologies in their health systems. The role of the people in the introduction of new technologies is increasingly becoming a major focus of research (Arntzen and Nkosi, 2009). The initial stages of the implementation of online services in the health care environment can be difficult, but considering that most technical obstacles are gradually eliminated, the question that arises is whether people are willing to use these new technological achievements (Aggelidis and Chatzoglou, 2009). Acceptance of information technology by users is deemed a necessary condition for its success (Davis, 1989).

In the information system (IS) domain, we find a considerable amount of academic research examining the determinants of information technology acceptance and utilization among users. Some theoretical models have been developed to explain the relationships between user's beliefs, attitudes and behavioral intentions. Among these models, the Technology Acceptance Model (TAM), first introduced by Davis (1989), is one of the most widely accepted models for research into new information technology acceptance. Another significant area of IS research is user's satisfaction because it is considered an important determinant in measuring IS success and use (Roca et al., 2006). Among the models developed to measure IS success, the model proposed by DeLone and McLean (1992) has emerged to be a dominant framework for system evaluation research. An important refinement of this model is the respecification proposed by Seddon (1997).

Whereas these theories add substantially to our understanding of why technologies are adopted and used, they do not explicitly focus on the continued use of the technology (Eriksson and Nilsson, 2007). Furthermore, despite the amount of academic research dedicated to examining the determinants of information technology acceptance and success, very little research has been conducted on health-related research areas (Aggelidis and Chatzoglou 2009). In addition, while eLoyalty has been widely studied in the information technology area, research has largely concentrated on customer responses to online retailers (e.g. Anderson and Srinivasan, 2003; Reichheld and Scheffer, 2000; Wang, 2007). The few studies focus in health care sector are limited to the analysis of health information websites (e.g. Gummerus *et al.*, 2004; Kim and Chang, 2007) or of off-line services (Chahal and Kumari, 2011; Moliner, 2009).

Hence, the primary aim of this research is to use the core concepts of TAM and Seddon's model to test the eLoyalty of patients towards online health care services offered by public health institutions. To achieve this goal, an integrated model is developed. To build our framework we initially make use of concepts of information quality, perceived usefulness, system quality, satisfaction and eLoyalty. Then we suggest that the development of satisfaction in practice can help patients to convert information related to online healthcare services into knowledge. Moreover, developing such satisfaction can be helped by using a variety of systems methodologies. In this way we expect to help citizens and also hospital administrator by enabling joined up thinking, cooperation and collaboration, in other words to improve existing relationships to give a variety of benefits to parties. In the following section we investigate the development of our model as to how the TAM and the Seddon's core variables contribute to eLoyalty.

2. Conceptual background

2.1 Technology acceptance model

The Technology Acceptance Model (TAM), first introduced by Davis (1989), is one of the most frequently employed models for research into new information technology acceptance. The TAM suggests that when users are presented with a new technology, a number of factors determine their decision about how and when they will use it (Davis, 1989). In TAM, user acceptance is evaluated by assessing the user's beliefs, attitudes and intentions.

Attitude toward using a technology (A) was defined by Davis (1989) as "the degree of evaluative affect that an individual associates with using a system in his or her job". Attitude is determined by a function of two beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). PU was defined as "the degree to which a person believes that using a particular system would enhance his or her job performance". PEOU is "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989). PU and PEOU create belief among potential users and sub-

sequently form their attitude. A user that believes the new technology will be useful and relatively easier to implement may be expected to have a more positive attitude towards that particular technology.

On the other hand, perceived ease of use has a direct effect on perceived usefulness. Between two systems that perform an identical set of functions, users find the one that is easier to use more useful. Perceived usefulness has no impact on perceived ease of use, however. As Davis (1993) explained, perceived usefulness concerns the expected overall impact of system use on job performance, whereas ease of use pertains only to those performance impacts related to the process of using the systems per se. Moreover, TAM postulates that Behavioural Intention (BI) is viewed as being jointly determined by the person's attitude towards using system (AT) and PU (Davis, 1989). Finally, actual system use is determined by BI.

2.2 Seddon IS success model

DeLone and McLean (1992) proposed a taxonomy and an interactive model as frameworks for conceptualising and operationalizing IS success based on a revision of the the existing definitions of IS success and their corresponding measures. Seddon (1997) believes that DeLone and McLean's model is too encompassing and introduces some confusion because it mixes process and casual explanations of IS success. Therefore, Seddon respecified and slightly extended a version of the DeLone and McLean's model to provide a clearer, more theoretically sound conceptualization of the relationships between the various IS success constructs.

Seddon's model considers three classes of variables: measures of information and system quality, general perceptual measures of net benefits of IS use (i.e. perceived usefulness and user satisfaction), and other measures of net benefits of IS use. Net benefits is an idealized comprehensive measure of the sum of all past and expected future benefits, less all past and expected future cost, attributed to the use of information technology application. To measure net benefits, one has to adopt some stakeholder's point of view (individuals, organizations and society) about what is valuable and what is not. Seddon (1997) claims that IS use is a behavior, not a success measure, and replace DeLone and McLean's IS use with perceived usefulness, which serves as a general perceptual measure of the net benefits of IS use. Measures of information and system quality and other measures of net benefits of IS use have a direct connection with perceived usefulness and user satisfaction. In turn, perceived usefulness has a direct connection with user satisfaction.

2.3 An integrated model

In this study both research streams are integrated by developing an online health care services success model based on the TAM and the Seddon's model variables, and their relationships. Our model included three classes of variables:

(1) *Measures of information quality and system quality*: Information quality refers to the desirable characteristics of the system outputs. For example: relevance, understandability, accuracy, conciseness, completeness, currency, timeliness, and usability (Stacey et al., 2008). On the other hand, system quality concerns the desirable characteristics of an information system. For example: system flexibility, system reliability, ease of learning or system features of intuitiveness. These characteristics reflect the conceptualization of the TAM's variable PEOU. Davis (1989) defined PEOU in his TAM as the degree to which a person believes that using a particular system would be free from effort. In fact, system quality has been represented in prior research by ease of use (Rai et al., 2002). Thus, in our model system quality was conceptualized as PEOU.

(2) *Perceptual measures of individual benefits of online health care services use*: In these measures we include PU and satisfaction. PU was defined by Davis (1989) as the degree to which a person believes that using a particular system would enhance his or her job performance. Seddon (1997) uses this Davis' PU measure in his model but, while Davis's measurement is future oriented, Seddon's model relates to perceptions derived of past system use. Therefore, the words "would enhance" are replaced by "has enhanced". Satisfaction represents the degree to which a user's perceived personal needs and the need to perform specific tasks satisfactorily are met by an information system (Goodhue and Straub, 1991).

(3) *Perceptual measures of organizational benefits of online health care services use*: In this research the goal pursued is eLoyalty. eLoyalty is not as generally employed for measuring IS success as per-

ceived usefulness or satisfaction. Notwithstanding this, in a volitional-use setting as online health care services, continued use (by individuals, organizations, or society) is clearly an important indicator of organizational benefits. Even in a mandatory-use setting, eLoyalty would be still a valid measure of success if it is used to summarize the person in power's overall expectations about the benefits of continued use of the online health care services (compared to benefits of changing to any alternative system).

The Seddon's model specifies the causal relationships between Information Quality, System Quality, PU, and Satisfaction. Davis (1989) also suggests in his TAM that PEOU (System Quality) is an antecedent of PU.

The relationship between satisfaction and loyalty seems almost intuitive, and several researchers have found that satisfaction leads to loyalty in their studies (e.g. Anderson and Srinivasan, 2003; Wang 2007). Satisfaction has a positive influence on user retention, likelihood of recommending, word of mouth and reuse/loyalty intentions (Van Riel et al., 2001; Taylor and Hunter, 2002; Yoon, 2002). User satisfaction associated with ICT usage can influence subsequent use of the technology (Menachemi et al., 2009). Moreover, Yang and Peterson (2004) and Yen and Gwinner (2003) found e-satisfaction exhibits a positive impact on eLoyalty. We understand that e-satisfaction is intrinsically coupled to the well-being of the patient. In other words, the prolonged use of online healthcare services depends on how satisfied the patient (user) is with the healthcare service.

Figure 1 provides a synopsis of the arguments above. In the next sections we present the concepts of organisational memory (OM) and the exploitation of knowledge (EK). These will allow us to link learning with online healthcare services as external sources of learning.

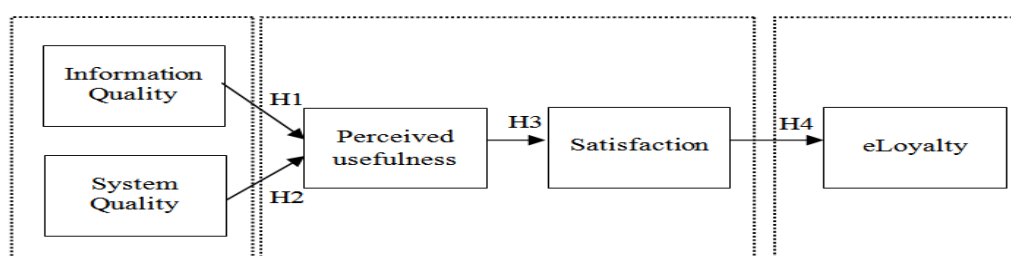


Figure 1: Areas of enquiry to improve online healthcare services for users.

3. Organizational memory (OM) and the exploitation of knowledge (EK)

We now use two concepts that will allow us to assess the value of healthcare services being provided to patients. These concepts are organizational memory and exploitation of knowledge. We choose them for two reasons. First, they allow us to assess and improve the use of knowledge by patients and their processes of learning. Second, they allow us to relate current healthcare services provision to users (e.g. patients and carers) activities by considering the former as external sources of knowledge to be used and exploited.

3.1 Organizational memory

'Organizational memory' (hereafter OM) is a shared and tacit cognitive map, a kind of collective mental model (Senge, 1999) that is used to guide decision making (Megill, 1997). There are many (and occasionally competing) definitions of OM, so we will start by briefly describing its usefulness and move on to detail OM general features. Megill (1997) for instance, defines OM as all active and historical information about an organization that is worth sharing, managing and preserving for later reuse. OM is also called 'corporate knowledge' by Hamel and Prahalad (1994), as it refers to the repository where knowledge that has been learnt is stored for future use and advantage. Davenport and Grover (2001) confirm the usefulness of OM by asserting that an organization's long-term success and growth become dependent on the successful use of its OM across its business processes.

OM includes not only 'hard-information' (e.g. numbers, facts, words and figures) but also 'soft-information', that is, individual or social information with meaning (e.g. expertise, experiences, anecdotes, critical incidents, stories and details about strategic and operative decisions). Selnes and Sallis

(2003), for instance, suggest that relationship memory includes idiosyncratic routines in the form of encoded formal and informal procedures and scripts including how the parties have learned to do things. The goal of soft-OM is that all members of the organization are aware of where the useful complementary abilities (e.g., who knows what? Who can help with that? Who can exploit new information?) reside. In this regard, Walsh and Ungson (1991) assert that soft-OM is 'represented' by many diverse aspects of an organization including for example: the organization's culture, transformations (production processes and work procedures), structure (formal organizational roles), ecology (physical work setting) and information archives (both internal and external to the organization).

In online healthcare services, OM can take a variety of forms including operational systems, organizational structures and daily routines. The most obvious structures for encoding these memories include information systems such as corporate manuals, databases, filing systems, etc. These systems are continually being updated and analyzed and are thus capable of generating new streams of information, thereby expanding knowledge (Zuboff, 1988). Existing organizational memory (OM) on online healthcare services can be seen as usually based on what has worked in the past, in other words what has been proved to be (un) successful. In this regard, OM may be 'measured' by many diverse aspects of the information provided for example: the relevance, accessibility and reliability (Doll and Torkzadeh, 1988).

Users have a variety of purposes when engaging in knowledge management initiatives and their knowledge management strategies go through different stages of formality and informality (Sparrow, 2005). From the possibilities and benefits given by knowledge management practices, it can be said that using organizational memory (OM) can be enhanced by acquiring and incorporating 'know-how' that resides elsewhere, and use existing informal knowledge sharing strategies to complement more formal strategies. In the case of online healthcare services, their use can become a valuable source of learning. In this regard, studies on PU and PEOU have been well researched, especially in the context of TAM applications. Measures for these two constructs have also been developed, validated, and adopted in many technology adoption studies (Chau and Lai, 2003). Therefore, OM is useful when it allows for its practical exploitation, what Chau and Lai (2003) call transforming OM into PU and PEOU.

On the other hand, soft-OM might be difficult to elicit, renew or update in users because it operates unconsciously and is already embedded in routines and ways of thinking. Moreover, development of knowledge in users via formal training methods has not yet proven to produce positive results in the healthcare domain. This consideration can help us explaining why certain online healthcare services have difficulties in getting users formally engaged in using e-services (e-loyalty). It might be the case that they offer little possibilities for the integration of sources of knowledge into user processes, or that they do not accommodate flexibility to incorporate 'secondary' or 'informal' sources of knowledge. Therefore in order to develop PEOU in users via OM, more personal contacts (with users) rather than solely 'formal', ICT-based or more expensive mechanisms need to be considered.

3.2 Exploitation of knowledge

According to Carroll (1998), 'Exploitation of knowledge' (EK) supports learning because it reduces uncertainty. It tells employees about their learning – what is working (do more of this) and what is not (do less of this). Carroll (1998) combines four processes of organizational learning that form a EK cycle: (1) 'observing' (i.e. noticing, attending, heeding, tracking); (2) 'reflecting' (i.e. analyzing, interpreting, diagnosing); (3) 'creating' (i.e. imagining, designing, planning, deciding); and (4) 'acting' (i.e. implementing, doing, testing), where acting affects observing, and so forth. Carroll (1998) also claims that EK takes place through various kinds of work activities (e.g. meetings, peer visits and exchanges of best practices).

As noted above, EK can be fostered by re-arranging existing OM sources. It can also be fostered by making existing knowledge more explicit, and by building and reviewing situated knowledge-theories (Wenger, 1999). With processes of knowledge exploitation, users (e.g. patients and carers) could improve the use of their knowledge-in-action, reduce transaction costs and increase cooperative efficiency. The above rearrangement of knowledge sources needs as Malhotra (2000) suggest, focusing on individual processes of 'learning', or challenging our current use of existing sources of 'raw' data or perceptions and our subsequent (e.g. intersubjective) interpretations of it. To enable EK to occur via individual learning, we propose the following three enablers:

- Identification of problems.
- Changing cognitive patterns, and
- Incorporation of new measures of control.

These phases are similar to those used by Pan et al. (2006) to explain how an e-government initiative was taken to successful completion, where people had to be engaged in a process of 'unfreezing–changing–refreezing' their commitment in order to take alternative courses of action different to those leading to failure. These processes account for the different 'moments' or junctures in e-government projects, so that in those moments projects can be re-defined in terms of their scope, participants involved and the roles of ICT. The idea is to exploit knowledge sources that are available within projects in order to address current problems. Unfortunately, these frameworks seem still to be focused on the government end, and little is said about online healthcare services.

We then use Carroll (1998)'s classification to develop a framework to assess and develop eLoyalty via exploitation of knowledge (EK) by online healthcare services. With the framework users can exploit knowledge by: (1) Identifying issues that affect identification of problems and opportunities with online healthcare services; (2) Facilitating the changing of cognitive patterns towards online healthcare services, and; (3) Integrating new measures for user monitoring their exploitation of knowledge on online healthcare services. Figure 2 provides a synopsis of a process that could be used to enable better design and use of online healthcare services and provision to users via EK.

As shown in figure 3 below, there are three main areas of inquiry, and the arrows indicate levels of online healthcare services knowledge exploitation. Departing from an identification of problems (diagnosis), we establish ways of developing OM capabilities to address these problems. Such problems might be related—in principle, with the use of online healthcare services as an external source of knowledge. Development of eLoyalty requires changing individuals' cognitive patterns, and should be based on facilitating interaction between individuals as well as using formal and informal sources of knowledge on online healthcare services. This can result in hospitals establishing mechanisms for the continuous renewal of online healthcare services knowledge, as well as monitoring its acquisition, use and maintenance.

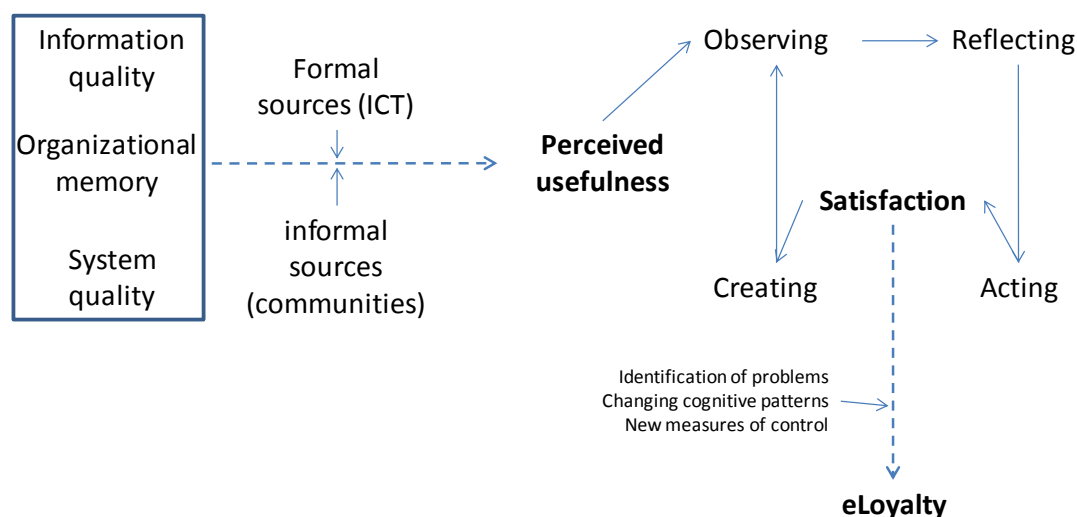


Figure 2: A framework to develop eLoyalty for online healthcare services

4. Discussion

Online health care services are a valuable tool for public health institutions to enhance their effectiveness. But since users of public health care services can choose between using technology-based services or a traditional face-to-face alternative, they need to perceive an advantage of using the technology and feel comfortable with it in order to select that option and build eLoyalty toward it. As the implementation of e-services implies a large investment, patients' eLoyalty is essential to avoid misspent resources. eLoyalty of the patient is important, and using an information systems theory to build patient loyalty will ensure the success of those services.

In our study, we proposed and empirically tested an integrated model of the TAM and the Seddon's model for understanding people's health technology services adoption behavior. Therefore, the first contribution of this research is to question those models and to integrate them to develop a model which relates technology and patient loyalty in online health care services. On the one hand, satisfaction is an antecedent of patients' behaviour, considered here as eLoyalty. Thus, the results support the belief, attitude, behaviour chain suggested by TAM. On the other hand, our model finds that quality perception dimensions (i.e. information quality and system quality) are antecedents of perceptual dimensions of individual benefits (i.e., perceived usefulness and satisfaction) and of organizational impact dimensions (i.e. eLoyalty), as Seddon's model suggests. We think that this is an important finding, as key criteria used in IS research can be also applied to the online healthcare services environment.

A second implication from our framework is that there could be key enablers leading to effective eLoyalty utilization by users. Although any new model that claims to be a new paradigm, idea or framework must be tested, the model shown in Figure 2 finds support on previous research (e.g. Carroll, 1998; Bhattacharjee 2002; Pan et al., 2006). The model denotes a perspective where valuable knowledge is conceived as being captured and codified from individuals, packaged and transmitted and processed through the use of three frameworks (i.e. identification of problems; changing cognitive patterns; and incorporation of new measures of control) and, hence, disseminated and used by users in other contexts. For managers, this means that in the case of an online healthcare service the company needs both to explore new possibilities and exploit old certainties (i.e. organizational memory) to help people to consider and access valuable sources of knowledge necessary to implement online healthcare services. Otherwise, we may end up with hospital administrators who often confuse "satisfaction" with believing that they always know better than anybody what online service does work and does not work. If this is the case, online services might then lose their appeal even before they are to be used by patients or carers. Hospital administrators can focus on enabling individuals to venture, innovate and challenge existing practices. They could well see online services as a resource to enable these activities to develop further.

As shown in Figure 1, in order to develop patient satisfaction, perceived usefulness plays a major role in creating a pleasant environment to facilitate the utilization of health technology services. This finding corroborates the notions of Guriting and Ndubisi (2006) that perceived usefulness is strongly associated with online healthcare services satisfaction. In this regard, Wu (2008) also found that the relationship between online service value and satisfaction was positively influenced by perceived usefulness. Results also indicate that Information Quality, and System Quality lead to perceived usefulness. Hence, it is very important to work to get the highest perception of usefulness in users by enhancing system quality and information quality.

From a managerial point of view, these findings suggest that since quality perception measures are the antecedents of benefits dimensions, managers should increase patients' eLoyalty by improving their beliefs of how online health care services can offer a quality experience. Policy-makers must instruct online services developers to focus on ease of use to increase system quality perceptions. Since population has different levels of technology readiness, reliable, user-friendly services, with good user interface consistency, should be designed. In addition, services should be pre-tested thoroughly and sufficiently across a wide range of users to see if they actually have been designed to be easy to use by the average patient. In failure to do so, implementation may prove unsuccessful and more resources have been spent than saved (Lanseng and Andreassen, 2007). In addition, information quality should be considered an important issue during the online services design because patients are more favourable inclined toward reuse them when they perceived that high-quality information is provided. Hence, policy-makers should establish mechanisms to provide clear, understandable, up-to-date, usefulness, completeness, customized and relevant information. Furthermore, it is essential to get a large part of the population to use the online services and to ensure eLoyalty of use in the majority of citizens. This way, adoption by the remaining parts of population could be a function of word-of-mouth and access to the internet. If so, the potential savings to society could be significant (Lanseng and Andreassen, 2007). Policy makers should develop promotional campaigns to publicize the online health care services between the users with potential interest in using e-services. These people could be the medium harnessed to increase the use of online health care services among the general public.

This research has several limitations. First, individual variables (such as age, gender or level of education) may affect the results. In futures studies, these variables could be incorporated into the research model. In addition, it could be interesting to explore what factors influence ease of use and information quality perceptions, such as system interface design, computer self-efficacy, social influence, resistance to change, and online instant guiding/helping (Al-Somali et al., 2009; Lai et al., 2009). Finally, the current model was designed with the research objective of integrating the TAM and the Seddon's model. Consequently, the rigor of the findings could potentially be enhanced through the inclusion of additional factors, such as trust.

5. Conclusion

Previous studies on eLoyalty have been focused on understanding why technologies are adopted (e.g. Davis, 1989, DeLone and McLean, 1992; Seddon, 1997) or exploiting knowledge processes (e.g. Carroll, 1998; Bhattacharjee, 2002; Pan et al., 2006) that do not provide for online healthcare services recognition of the needed knowledge processes. In addition, previous studies of conceptions of eLoyalty from the perspective of the organization have been conducted in a wide variety of contexts (e.g. Brakensiek, 2002). Overall, these studies do not provide conclusive evidence of how eLoyalty can be operationalised in the healthcare domain. In this paper, we made some suggestions on how to manage eLoyalty which will stimulate the innovation process. In summary, the model presented in Figure 1 suggests that satisfaction is a necessary step in eLoyalty formation.

In our framework, assessing online healthcare services requires users to continuously and appropriately 'learn', to think 'outwards', to acquire and exploit knowledge, and to use healthcare services as means to support knowledge exploitation. For those hospitals currently providing online healthcare services, our framework should encourage them to have a better and more flexible degree of involvement with end-users in the design of such services to facilitate continuous knowledge exploitation and eLoyalty formation. Thus, healthcare providers must continuously work at obtain satisfied users to encourage their continuing using of online services. In addition, this is an important finding, as loyalty is not an aim by itself, but a way to improve profitability. In the Reichheld and Scheffer's (2000) opinion the increase of 5 % loyalty rate supposes an increase between 40 and 60 % business performance. Therefore, eLoyalty can help public hospitals understand target market needs and, ultimately, recover the investment that has been done to get and maintain technologies (Zviran and Erlich, 2003).

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