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ARTICLE DE RECHERCHE

Healthcare service innovation based on information technology: The role of social values alignment

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ABSTRACT

The electronic personal health record (ePHR) is an information technology (IT) designed for patients' empowerment in health self-management. Its actual implementation remains less than expected due to two main barriers that must be addressed by ePHRs' providers: lack of trust in providers with regards to data privacy and lack of flexibility of the tool. In this study, we suggest that to potentially overcome these two challenges, ePHRs could be provided by health cooperatives (co-ops) in collaboration with open source development communities that share similar values. Based on the concept of social alignment that focuses on values, we explore the potential social bi-alignments between the values underlying the mission of health co-ops and the purpose of ePHRs, and between the foundational values of health co-ops and open source development communities. We also explore the effect of such potential social values alignments on health co-ops' interest in innovating with an ePHR-based service. To achieve our research objectives, 17 interviews were conducted in health co-ops in Quebec, a province of Canada where the network of health co-ops is particularly active. Our findings show that the concept of social values alignment is useful in the context of ePHR-based service innovation in health co-ops. However, our data analysis shows that social values alignment is not sufficient for healthcare service innovation to happen. Indeed, our findings lead us toward the concept of organizational readiness to better understand what is required to increase the likelihood of ePHR-based service innovation in health co-ops. This study culminates with the undertaking of theoretical development where we propose a conceptual model of IT-based service innovation in healthcare organizations by expanding on our findings and on insights from the literature.

Keywords: *Social values alignment, Organizational readiness, Healthcare service innovation, Electronic personal health record (ePHR), Open source community.*

RÉSUMÉ

Le dossier de santé personnel informatisé (DSPI) est une technologie de l'information (TI) conçue pour l'autonomisation des patients en matière d'autogestion de la santé. Toutefois, son déploiement réel reste moindre que prévu en raison de deux barrières principales que doivent adresser les fournisseurs de DSPI : manque de confiance envers le fournisseur dans la confidentialité des données et manque de flexibilité de l'outil. Pour outrepasser ces barrières, nous envisageons la possibilité que les DSPI soient offerts par les coopératives de santé en collaboration avec la communauté de développement open source *partageant des valeurs similaires. En mobilisant le concept d'alignement social qui met l'accent sur les valeurs, nous explorons d'abord la possibilité d'alignements sociaux entre les valeurs sous-jacentes à la mission des coopératives de santé et celles sous-jacentes à la finalité des DSPI, et entre les valeurs fondamentales des coopératives de santé et celles des communautés de développement* open source*. Nous explorons aussi l'effet de ces alignements potentiels sur l'intérêt des coopératives de santé à innover avec un service de santé basé sur le DSPI. Pour atteindre nos objectifs de recherche 17 entrevues ont été menées dans des coopératives de santé au Québec, une province du Canada où le réseau des coopératives de santé est particulièrement actif. Nos résultats montrent que le concept d'alignement des valeurs sociales est utile dans le contexte de l'innovation de service basé sur un DSPI dans les coopératives de santé. Toutefois, notre analyse des données montre que l'alignement des valeurs sociales ne suffit pas pour qu'une telle innovation se produise. En effet, nos résultats nous ont conduits vers le concept de prédisposition organisationnelle afin de mieux comprendre ce qui est nécessaire pour augmenter la probabilité que l'innovation de service basé sur un DSPI se produise au sein des coopératives de santé. Cette étude se termine par l'amorce d'un développement théorique où nous bâtissons sur nos résultats et sur la littérature pour proposer un modèle conceptuel de l'innovation de service basé sur les TI dans les organisations de soins de santé.*

Mots-clés : *Alignement des valeurs sociales, Innovation de service de santé, Dossier de santé personnel informatisé (DSPI), Communauté open source, Prédisposition organisationnelle.*

INTRODUCTION

The electronic personal health record (ePHR) is an information technology (IT) designed to support patients in health self-management (Johansen & Henriksen, 2014). This emerging tool has been defined as "an electronic application through which individuals can access, manage and share their health information, and that of others for whom they are authorized, in a private, secure, and confidential environment" (Markle Foundation, 2003, p. 14). EPHRs promote patients' empowerment by allowing patients to re-appropriate and control their personal health information and to stand at the forefront of their health information management. An ePHR therefore has the potential to transform the role of patients and their relationship with healthcare professionals (Tzeng *et al.*, 2015).

While many applaud the possibility of access to an ePHR, the actual implementation of such tool remains less than expected (Ant Ozok *et al.*, 2014; Kerns *et al.*, 2013; Nazi, 2010). Two main challenges need to be addressed by any ePHR provider. The first challenge is related to the patients' lack of trust in the ePHR provider itself. The risk of malicious misappropriation of health data stored in ePHRs constitutes a major barrier for patients (Andrews *et al.*, 2014; Lafky & Horan, 2011). The second challenge refers to the lack of ePHRs' flexibility. Most ePHRs do not meet patients' expectations and evolving needs in terms of features (Monkman & Kushniruk, 2013; Johansen & Henriksen, 2014).

In this study, we suggest that to potentially overcome these two challenges, ePHRs could be provided by health cooperatives (co-ops) in collaboration with open source development communities. First, collective ownership in health co-ops offers the advantage of protecting the interests of members (Novkovic, 2008), thus limiting the likelihood of a malicious use of health information stored in ePHRs. Second, the communal open source development approach brings an inherent flexibility to open source software (Kopanitsa & Taranik, 2014; Yackel, 2001). EPHRs created by open source communities are believed to be more flexible and anchored in the reality of personal health information management (Yackel, 2001). Moreover, the idea of innovating with a service based on open source ePHR in health co-ops is reinforced by the potential fit of values, or *social values alignment*, between health co-ops, open source communities, and ePHR. In fact, there are many similarities between open source development communities and non-profit organizations like health co-ops in terms of values, such as sharing access to resources and information (Eynaud, 2006). Moreover, patient empowerment is a shared value of health co-ops (as reflected in their mission) and of ePHRs (as reflected in their purpose) (Girard, 2014; Novkovic, 2008; Tzeng *et al.*, 2015). We suggest that fit of values or social values alignment could play a particularly important role in IT-based service innovation in healthcare.

Therefore, our two research objectives are: 1) to specifically assess the interest of health co-ops in innovating with an open source ePHR-based service; 2) to explore the role of social values alignment on IT-based service innovation in healthcare organizations more generally. To attain our first objective, a qualitative study is conducted to source certain answers through interviews conducted in 17 health co-ops in Quebec, a province of Canada with a particularly active network of health co-ops. Our second objective is

achieved by expanding on our findings and insights from the literature to propose a conceptual model for IT-based service innovation in healthcare organizations that could guide further research. Indeed, the usefulness of the *organizational readiness* concept has surfaced from our data analysis as a way to better understand IT-based service innovation in healthcare organizations. Overall, our study answers recent calls for the development of new ideas and frameworks on IT-based service innovations in general and in healthcare in particular (e.g. Barrett *et al.*, 2015; Lusch & Nambisan, 2015).

The remainder of this article is organized as follows. We begin by presenting the ePHR as a service innovation as well as the important challenges and solutions enumerated in the academic literature with respect to innovating with ePHRs within healthcare organizations. Then, we describe the potential social values alignment between health co-ops and open source development communities, and between health-co-ops and ePHRs. The theoretical basis, the methodology and our research findings are then described, followed by the proposition of a conceptual model expanding on our empirical findings and insights from the literature. Finally, a discussion of the findings and proposed model for IT-based service innovation in healthcare organizations is presented along with some limitations and research avenues.

1. CONTEXT FOR OPEN SOURCE EPHR-BASED SERVICE INNOVATION IN HEALTH CO-OPS

In the last ten years, developments in IT, growth in citizens' expectations for personal services, and evolving interest in services among industries have fostered service innovation, including in healthcare provision (Barrett *et al.*, 2015). Researchers have consistently theorized that IT plays a fundamental role in such innovation, proposing that IT-based service innovation is a critical and timely area of study in Information Systems (IS) (Lusch & Vargo, 2014; Barrett *et al.*, 2015). Much IS research examines the role of IT in improving services or creating new ones (Barrett *et al.*, 2015). Typologies of IT-based service innovations have also been proposed (e.g. Lyytinen & Rose, 2003) and used for examining the impact of specific types of innovations on firm performance (e.g., Ordanini & Rubera 2010).

Service innovation in healthcare organizations can take multiple forms including "new services in the local market, services that are completely new to the health care facility, new information dissemination channels, refinements to existing services, services to increase economies of scale in existing markets, and expanded services for existing patients" (Thambusamy & Palvia, 2011, p. 16). Healthcare service innovation refers to "the development of new healthcare services that favor proactive, preventive and personalized primary care services (e.g. vaccination, genetic testing) and focuses on the patient's quality of life and well-being" (Raymond *et al.*, 2015, p. 4). Healthcare service innovation based on IT refers more specifically to healthcare services "delivered or enhanced through the Internet and related technologies" (Chen *et al.*, 2014, p. 514). As such, we consider ePHR service as an IT-based service innovation in healthcare.

A service innovation is being "created with a particular value proposition in mind, which enables the user of the

service to create value for themselves or their community" (Cullen, 2008, p. 255). Such types of innovation should benefit the organization that has implemented it by adding value to its clients (Toivonen & Tuominen, 2009). In our study, the clients are the members-patients who use such IT-based services offered by health co-ops. To better understand the context for open source ePHR-based service innovation in health co-ops, we first describe the challenges related to the implementation of ePHRs that any provider must address. This is followed by a description and comparison of health co-ops and open source development communities that could collaborate together to allow ePHR-based service innovation in health co-ops.

1.1. Challenges to ePHRs' implementation

As introduced earlier in this article, two main implementation challenges exist for ePHRs and must be addressed by any ePHR provider, i.e., any organization where the personal health data of the ePHR users is stored. The first challenge is related to the patients' lack of trust in the ePHR provider itself. Most notably, ePHRs users fear their health information falling into the hands of their employers (Lafky & Horan, 2011). It is recognized that the risk of malicious misappropriation of health data constitutes a major barrier for ePHR use (Andrews *et al.*, 2014; Lafky & Horan, 2011). The deeply sensitive nature of personal health data and the associated privacy issues discourage the adoption of even the most functionally and technically perfect system (Dinev *et al.*, 2016).

The second challenge refers to the lack of ePHRs' flexibility. Users are seeking tools that can constantly adapt to their individual needs; in other words, ePHRs should be fully customizable (Ant Ozok *et al.*, 2014). However, potential users "of health technology will be less likely to accept the technology when they perceive it as disadvantageous or functionally incompatible with their needs, existing values, or past experiences" (Or *et al.*, 2011, p. 57). Most ePHRs available on the market do not meet the expectations and evolving needs in terms of features (Monkman & Kushniruk, 2013; Johansen & Henriksen, 2014).

1.2. Health co-ops providing ePHRs

One avenue to deal with the issue of trust in ePHR provider is to use member-owned organizations, such as health co-ops (Marsan & Pascot, 2014). According to the *International Cooperative Alliance* (ICA), a co-op is "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise" (ICA, 2015, p. 1). Co-ops across the world share three main characteristics (Dunn, 1988; Zeuli & Cropp, 2009). First, co-ops are user-owned, which implies that those who use the co-op (i.e., members) help finance the co-op and therefore own the co-op. Members are responsible for providing at least some of the co-op's capital. This shared financing creates joint ownership. Second, co-ops are user-controlled, which means that members of the co-op govern the business directly by voting – usually one member = one vote – on significant and long-term business decisions and indirectly through their representatives on the board of directors. Voting rights are tied to membership and not to the level of investment in or patronage of the co-op. Third, co-ops are user-benefiting,

which means that the co-op's main purpose is to provide and distribute benefits to its users on the basis of their use. A co-op is a business venture, and as such is not precluded of making a profit, but one that aims primarily to answer the needs of its members, may they be customers, producers or employees. Hence, a co-op has limited uses for its excess revenues; specifically, a limited part of the excess can be returned to its members and the rest is reinvested in the co-op.

Health co-ops are present throughout the world. Almost 5,000 health co-ops exist in 43 countries, in greatest number in the Americas, followed by Europe, Asia, Africa and Pacific, and have more than 81,000,000 members (Girard, 2014). Health co-ops have a mission of patients' empowerment and the main service offered is access to a family physician (Girard, 2014). However, many health co-ops struggle to retain members-patients over the years (Girard, 2014; Hébert & Prémont, 2010). The added-value that members of health co-ops find compared to what they would normally obtain in traditional health facilities is not merely based on the access to a family physician, but on complementary services such as walking clubs and discussion groups (Girard, 2014; Hébert & Prémont, 2010). Therefore, offering a trustworthy ePHR-based service in health co-ops could help health co-ops realize their mission, retain their actual members and attract new ones. Only a few health co-ops, such as *Group Health Cooperative* in the United States, *Health Connex* in Canada and *Taltioni Cooperative* in Finland, are offering ePHRs to their patients (Girard, 2014; Wynia *et al.*, 2011).

Health co-ops appear to be welcoming structures, propitious to the diffusion of ePHRs, since their mission focuses on patients' empowerment (Girard, 2014). Moreover, storing patients' health data in health co-ops could encourage the adoption of ePHRs (Marsan & Pascot, 2014). Indeed, collective ownership offers the advantage of protecting the interests of members (Novkovic, 2008), thus limiting the likelihood of a malicious use of health information. Because the interests of co-ops are linked to those of their members, an atmosphere of trust should be present naturally and alleviate concerns over the misuse of health information.

1.3. Open source communities developing ePHRs

To meet the need for flexibility and customization of ePHRs, the open source approach for developing software is a promising avenue (Marsan & Pascot, 2014). Open source software adheres to technical standards that bring an inherent flexibility to computerized systems (Kopanitsa & Taranik, 2014; Yackel, 2001). It has been used even in industries such as the military where the quality, stability, and security are critical components of software developed and used amongst partners (Benkeltoum, 2016). Moreover, the open source approach draws upon globally distributed collaborative communities bringing together dedicated developers and users who share their knowledge to better meet the expectations of the latter (Aksulu & Wade, 2010; Fitzgerald, 2006; Lee & Davis, 2003). Indeed, the open source development process allows any individual to propose improvements to the software, and even to participate in their development (Janamanchi *et al.*, 2009). This is usually done through online forums and increasingly through small service enterprises bridging users and developers in open source communities (Fitzgerald, 2006).

The flexibility of open source products paves the way for steady progress that will come from the patients themselves. Valdez and Brennan (2015) insist on the relevance of methods which "leverage patients as full partners in the design process" (p. 372) of IS. It is highly recommended that developers and service providers involve potential users as early as the tool design stage in order to identify their needs and respond adequately. Patients' involvement early in the development process of ePHRs should be accompanied by greater flexibility downstream (e.g., Kerns *et al*., 2013; Archer *et al*., 2011; Huba & Zhang, 2012; Somner *et al*., 2013). Some open source communities are already developing open source ePHRs, such as *MyOSCAR*, *Tolven*, *Indivo* and *HealtheMe* (Krukowski *et al*., 2014). EPHRs created by open source communities are believed to be more flexible and anchored in the reality of personal health information management, which is a major drawback in current ePHR systems (Yackel, 2001).

1.4. Similarities between open source communities and health cooperatives

Open source communities and health co-ops share many characteristics. First, some open source communities are organized as non-profit organizations such as co-ops (Zhang *et al.*, 2010). Second, open source communities are often composed of volunteering coders, documenters and bug reporters, and rely almost exclusively on donations, either in money or in kind (e.g., source code or documentation contributions) (Jin & Robertson, 2008; Choi *et al.*, 2015; Choi & Chengalur-Smith, 2015). Similarly, health co-ops depend heavily on a voluntary workforce and rely mainly on external funding sources such as grants and donations (Umapathy & Huang, 2015; Richardson *et al.*, 2011; Gutierrez & Zhang 2007). Third, the development process of computerized systems by open source communities involves a "free, independent, and indiscriminate redistribution of software, source code and reuse licenses" (Aksulu & Wade, 2010, p. 577). This process allows anyone to propose improvements to the systems, and even to participate in their development (Janamanchi *et al.*, 2009). Similarly, health co-ops are autonomous associations that are user-owned, user-controlled and user-benefited (Dunn, 1988; Zeuli & Cropp, 2009). Raymond (1999) insisted on the importance of getting the developers engaged and excited about the software that they are working on. He also mentioned that the coordinator of a group should have very good communication skills. The regulation of open source communities is autonomous and intuitive (Stewart & Gosain, 2006). Yet, such regulation evolves over time and ends up mirroring the social construction that individuals experience in their regular lives. Participants of those communities behave in a certain way that becomes the social norm that ends up structuring the behaviours of the same participants (Gosain, 2003). Fourth, open source communities offer a way to re-appropriate computer science via free access to software source codes (Aksulu & Wade, 2010). Similarly, co-ops offer a way to re-appropriate means of production (Novkovic, 2008). Both have the desire to escape from the alienation of market incentives and corporate hierarchies (Bauwens, 2008).

Last but not least, there are many similarities between open source development communities and non-profit

organizations like health co-cops in terms of values emphasizing co-operation (Eynaud, 2006). Open source communities rely on deeply-held common values, including sharing and helping (Gosain, 2003; Stewart & Gosain, 2006). Similarly, health co-ops reflect the values expressed by the International Co-operative Alliance, such as equity and solidarity (ICA, 2015).

In sum, open source communities seem in tune with health co-ops' spirit and daily reality and thus they could be natural collaborators for implementing ePHRs. Thus, collaboration between health co-ops and open source communities could be an interesting approach to implement ePHR-based service innovation in healthcare (Marsan & Pascot, 2014). However, to our knowledge there is no health co-op offering an ePHR that is open source.

2. SOCIAL BI-ALIGNMENT APPROACH FOR OPEN SOURCE EPHR-BASED SERVICE INNOVATION

Typically, "alignment" is understood as the compatibility between two organizations, entities, or concepts, and can be applied to a wide range of domains, including IS research (Ullah & Lai, 2013; Chan & Reich, 2007; Tan & Gallupe, 2006). IS researchers and practitioners have insisted on the importance of the business-IT alignment concept for the success of transformations involving IT (El-Mekawy *et al.*, 2015; Croteau & Bergeron, 2001). Researchers argue that business-IT alignment helps organizations to be more focused on their strategic use of IT and become more competitive (Kearns & Lederer, 2003; Chan *et al.*, 2006).

Karpovsky & Galliers (2015) report that the topic of business-IT alignment has drawn the attention of academics and practitioners for more than three decades starting with McLean & Soden (1977) who have developed the notion of strategic planning for an effective use of IT. The following milestone was the alignment framework proposed by Henderson & Venkatraman (1993) who were among the firsts to suggest that the organization should align elements from both domains of business and IT (i.e., business strategy, IS strategy, business structure and IT infrastructure) in order to achieve business performance. To be more specific, business-IT alignment refers to "the degree to which the mission, objectives, and plans contained in the business strategy are shared and supported by the Information Technology (IT) strategy" (Reich & Benbasat, 1996, p. 56). The alignment framework inspired several empirical studies with findings that indicate that well-aligned organizations see their performance increases (Chan *et al.*, 1997; Croteau & Bergeron, 2001; Sabherwal & Chan, 2001; Bergeron *et al.*, 2004; Oh & Pinsonneault, 2007; Yayla & Hu, 2012; Gerow *et al.*, 2014; Coltman *et al.*, 2015). Research on business-IT alignment distinguishes between alignment in terms of intended strategic plans (e.g. Kearns & Lederer 2003) and alignment in terms of realized strategy (e.g. Sabherwal & Chan 2001). However, most research focus on realized alignment (Croteau & Bergeron 2001; Coltman *et al.*, 2015).

Alignment of IT and business can also take multiple forms: strategic, structural, cultural, and social (Chan & Reich 2007). Strategic alignment refers to "the degree to which the business strategy and plans, and the IT strategy and plans, complement each other" (Chan & Reich

2007 p. 300). Structural alignment relates to "the degree of structural fit between IT and the business" in terms of "structures, processes, and accommodations that evolve when organizing IT" in the organization (Chan & Reich, 2007 p. 300). Cultural alignment describes the degree of fit between the IS planning process and cultural elements such as the business planning approach (Pyburn, 1983). Social alignment was originally defined as "the state in which business and IT executives within an organizational unit understand and are committed to the business and IT mission, objectives, and plans" (Reich & Benbasat, 2000, p. 82).

More recently, Cram (2012) offers a definition of social alignment that focuses on IS values: "the degree to which the cultural values of an individual or group are consistent with the core values embedded in the IS processes and procedures conducted in pursuit of an organization's IS strategy" (p. 713). Cram (2012) showed that social values alignment between project team's organizational values and the values of the systems development approach influenced the project team's performance and the satisfaction of the project team members of the systems development process. In the context of our research, *the social form of business-IT alignment* proposed by Cram (2012) is the most relevant one because of its focus on values.

2.1. Intra-organizational social alignment

Since a health co-op's mission is to empower members-patients (Girard, 2014; Novkovic, 2008) and an ePHR's purpose is similarly to empower patients (Tzeng *et al.,* 2015), we suggest that there is a natural internal social alignment between a health co-op and an ePHR. Empowering the patient is an integral part of the ePHR tool, since it allows individuals to control their personal information and, thus, to place themselves in the forefront of the management of their own health records (Tzeng *et al.*, 2015). Similarly, health co-ops contribute to empowering their patients and members through their democratic functioning (Girard, 2014; Novkovic, 2008).

In the case of both ePHRs and health co-ops, patient empowerment is an intrinsic goal and becomes a shared value that guides the developers' behaviors in their programing choices (Stewart & Gosain, 2006) and transforms the ePHR as a powerful tool to reach such goal. Any product can be seen as a carrier of values that are embedded in the purpose of the product itself (Lerdahl, 2008; Sahlins, 2013). IT products are no exception according to DeSanctis and Poole (1994) in that any IT supports a set of values and promotes specific goals. In this specific context, we define *intra-organizational social alignment* as *the degree to which the values underlying the mission of health co-ops is coherent with the values underlying the purpose of ePHR tools.*

2.2. Inter-organizational social alignment

Given that we also want to explore the alignment between the health co-ops and open source development communities, it seems appropriate to broaden the study of alignment between distinct organizations, a concept called inter-organizational alignment (Pijpers *et al.,* 2012). Business-IT alignment can occur internally and also between organizations, for example the client and the IT vendor (Palvia *et al.,* 2011). This type of alignment occurs within networked value constellations, which are "sets of organizations

which collaborate to jointly satisfy a complex customer need" (Pijpers *et al.*, 2012, p. 203). From this angle, inter-organizational social alignment takes place between organizations dedicated to fulfilling a given need and focuses on the interactions that exist between them to generate an optimal alignment with respect to IT (Palvia *et al.,* 2011).

Open source communities and non-profit organizations like health co-ops are recognized to be based on strong values or even ideologies and to share values emphasizing co-operation (Stewart & Gosain, 2006; Eynaud, 2006). Open source development communities and the open development process that they use and promote are characterized by values such as sharing, helping and cooperation (Gosain, 2003; Stewart & Gosain, 2006). For their part, health co-ops reflect the values expressed by the International Co-operative Alliance, such as equality, equity and solidarity (International Co-operative Alliance, 2015). Thus, the equality and the equity values that characterize co-ops can be found in open source communities through the value of sharing. Similarly, such values of solidarity for co-ops and those of helping and collaboration for open source communities are notions that are comparable in their propensity to encourage individuals to regroup and move the organization forward. In this specific context, we define *inter-organizational social alignment* as *the degree to which the foundational values of health co-ops are consistent with the core values embedded in the processes and procedures of the ePHRs developers*.

2.3. Social bi-alignment

With the help of the concept of business-IT social alignment, we therefore determine two *a priori* essential components for the development of an approach for open source ePHR-based service innovation in health co-ops: 1) an intra-organizational social alignment between the mission of a health co-op and the purpose of the ePHR as a tool; 2) an inter-organizational social alignment between the foundational philosophies of health co-ops and of open source development communities. Figure 1 captures the social bi-alignment approach that we propose in order to better understand how and why ePHRs would be offered by health co-ops to their members-patients and developed by open source development communities.

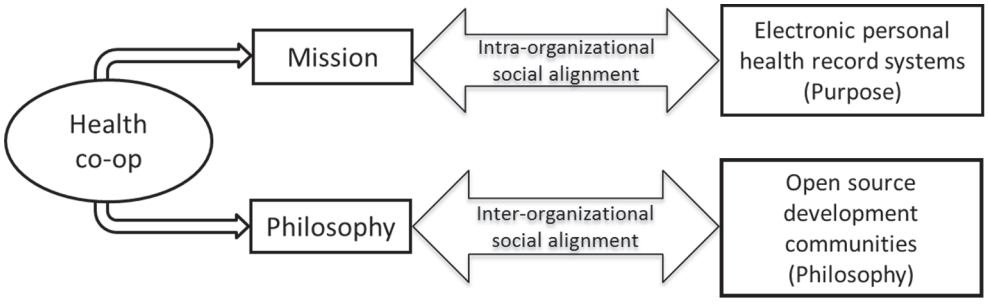

Figure 1: Social bi-alignment approach for open source ePHR-based service innovation in health co-ops.

3. METHODOLOGY

Given the novelty of our research topic and our exploratory stance, we have decided to use a qualitative approach (Yin, 2003). We have applied the guidelines of Dubé and Paré (2003) for exploratory multiple-case study to the greatest extent possible, given certain practical limits imposed by the reality of our participants' setting and the nature of our research objectives.

3.1. Selection of the setting and cases

A qualitative study involving interviews with key informants about IT and service innovation decisions in their respective health co-ops was conducted in the Canadian province of Quebec. We chose to collect data in this setting for two reasons. First, the sector of health co-ops is particularly active in Quebec. Health co-ops have existed there since the beginning of the 1940s. In 2014, at the time of our data collection, there were 37 health co-ops in operation in Quebec according to Girard (2014). Most of these health co-ops are members of the *Fédération des co-opératives de services à domicile et de santé du Québec* (FCSDSQ). This federation's mission is to ensure the promotion and development of co-ops in the health sector in Quebec. The sphere of activity of the FCSDSQ extends to 70,000 members-patients of health co-ops. These few statistics are a good indication of the vigor of the sector of health co-ops in Quebec, and reveal a fertile ground for reaching our research objectives. Another reason for choosing this setting is that no health co-op was offering an ePHR to its members at the time our data was collected, which made it a fertile ground to assess interest for innovating with ePHR-based service.

In order to optimize the initial contact and reach a maximum of health co-ops in literal replication logic (Yin, 2003; Dubé & Paré, 2003), we appealed to the FCSDSQ itself. Thus, the federation assisted the researchers in the process of recruiting health co-ops by sending an email to the 37 health co-ops located in Quebec at the beginning of September 2014. A first email invited the co-ops to participate in the study and a reminder was sent three weeks later. In this way, we were able to conduct interviews at 17 health co-ops, almost 46% of the health co-ops active in Quebec in 2014. Two of them were not current members of the FCSDSQ, but were on its mailing list.

3.2. Data collection

The 17 interviews were conducted during the September-December 2014 period in health co-ops of various sizes, some with a few more than a hundred members, and others with thousands of members, and in various locations, twelve in rural areas, and five in cities. The oldest one was created in the mid-1990s' and the youngest had less than one year at the time of our data collection. The unit and level of analysis being the healthcare organization, each co-op had to identify a key informant who is responsible for deciding what new services are brought up to members of the co-op during the annual assemblies. In 15 co-ops, a single individual was identified as being able to answer our questions, either a representative of the medical team (i.e., physician or nurse) or more often a representative of the administrative team (i.e., president, general manager or coordinator). In one co-op three individuals were identified and in another one there were four individuals. In each of these two co-ops, the group was composed of representative(s)

Health Coop	Foundation	Localization	Size (# of members)	Key Informant(s)
A	c. 2000	Urban	6000-6999	General Manager
B	c. 2005	Rural	3000-3999	General Manager
C	c. 2010	Rural	4000-4999	General Manager
D	c. 2005	Rural	1000-1999	Coordinator
E	c. 2010	Rural	1000-1999	Coordinator
F	c. 2010	Rural	5000-5999	President of the Board
G	c. 2000	Rural	3000-3999	President of the Board
H	c. 2010	Rural	1000-1999	General Manager
I	c. 2005	Rural	1000-1999	Coordinator
J	c. 2010	Urban	1-999	Coordinator
K	c. 2005	Urban	6000-6999	General Manager; Administrative Employee; Physician; Nurse
L	c. 2005	Rural	1000-1999	General Manager
M	c. 2010	Rural	1000-1999	Coordinator
N	c. 2005	Urban	4000-4999	General Manager
O	c. 2005	Rural	1000-1999	Nurse Practitioner
P	c. 2005	Rural	1-999	General Manager
Q	c. 2010	Urban	1-999	Vice-President of the Board; Coordinator; Nurse

Table 1: Profile of participating health co-ops.

of the administrative team and representative(s) of the medical team. These persons were together responsible, as a group, for service innovation organizational decisions. Table 1 presents the details about the profile of each co-op.

As mentioned earlier, we had to relax Dubé and Paré's (2003) guideline concerning the use of multiple sources of data for each case in order to be consistent with the reality of our participants' context and the nature of our research objectives. Since our research objectives are prospective, that is we were studying the *eventual* offering of a new IT-based service and the potential business-IT alignments, we needed to have the view of the person or entity responsible for deciding what new services to bring up to members during the annual assemblies. Since many health co-ops are small in terms of number of employees, this entity is often a single individual, and therefore limited our access to a large number of points of view. This is due to the non-profit nature of health co-ops. Contrary to for-profit organizations, non-profits have

the mission to create social values instead of maximizing profits and they rely mainly on external funding sources such as grants and donations (Umapathy & Huang, 2015; Richardson *et al.*, 2011). Consequently, non-profits depend heavily on a voluntary workforce and usually do not have any full-time or part-time technology staff (Umapathy & Huang, 2015; Gutierrez & Zhang, 2007). A large portion of non-profits are very small organizations with only 2 to 10 staff members, either full-time or part-time, and technology-related decisions are mostly made by the CEO or executive director solely (Umapathy & Huang, 2015).

The key informants were encountered during face-to-face interviews. The interviews were conducted jointly by the first two authors to ensure a common understanding of the interview guide and to standardize the interview protocol. A semi-structured, open-ended interview guide was developed before data collection (Dubé & Paré, 2003; Yin, 2003) and is presented in the appendix. The average length of each interview was 45 minutes. Each interview was recorded by the interviewers and then transcribed by a professional transcriber. Immediately after each interview or no later than the day after the interviewers discussed the gathered data in order to share understanding and identify new insights brought by the newly collected data (Dubé & Paré, 2003).

3.3. Data analysis and validation

We applied Dubé and Paré's suggestion to have "different roles by different investigators including research assistants" (2003, p. 612). These diverse roles assumed by the three researchers and the research assistant allowed us to develop and contrast diverse views, thus capturing greater richness and fostering higher confidence in the findings and theoretical development we have undertaken (Dubé & Paré, 2003; Patton 2002; Eisenhardt, 1989).

A coding scheme was developed (Yin, 2003) with three main categories: 1) interest for ePHR-based service innovation; 2) intra-organizational social alignment; 3) inter-organizational social alignment. The first and last authors both coded the same two interviews, and subsequently met to discuss and resolve differences in the coding. This meeting also involved the second author in order to have a third view in case of discrepancies. The interrater reliability between the two coders was 89.4% and all disagreements were resolved by the creation of a new category: *barriers to ePHR-based service innovation*. An example of a disagreement that has brought the creation of this new category is the following: One coder put the interview extract "Yes we are interested in providing an ePHR, but not now because the employees are too occupied" in the category *interest for ePHR-based service innovation.* However, the other coder considered the extract as meaning the contrary, i.e., that the co-op is uninterested in innovating with ePHR-based service. Such a disagreement was resolved in deciding that the extract in fact demonstrated an interest to innovate, but that an impediment or barrier also existed. Therefore, the extract was split and coded in two categories: "Yes we are interested in providing an ePHR" was coded in the category *interest for ePHR-based service innovation*; and "the employees are too occupied" was coded in the new category *barriers to ePHR-based service innovation*. We followed the recommendation by Agarwal *et al*. (2010) and Robinson (1951) that in order to permit the discovery of unforeseen interpretations, a coding scheme should not be constraining for researchers.

Once the coding scheme had been stabilized with the final four categories, Nvivo software was used to analyze the transcripts in three steps (Yin, 2003): (1) examining the transcripts; (2) categorizing the pieces of evidence or extracts of transcripts along categories in the coding scheme; and (3) comparing the pieces of evidence across co-ops in each category to check if potential alignments exist, if co-ops are interested in innovating with ePHR-based service and if barriers to such innovation exist. The last author performed steps 1 and 2 for all the interviews. The coding period for these two steps started after the 12th interview was transcribed and concluded with the codification of the 17th interview. Afterwards, the first and second authors performed step 3 together. Again, this was done with an open mind to allow new interpretations to emerge (Agarwal *et al*., 2010; Robinson, 1951).

The findings were summarized, accompanied by the most "substantive" quotations from interviews (Gillham, 2000) and presented to the FCSDSQ during a meeting at their office. Findings were subsequently presented to health co-ops during a theme day organized by the federation for its members. Those present, both those who had participated in the study and those who had not, confirmed that the findings were an accurate reflection of their co-ops' reality. According to Hartley (2004), this last step increases the validity of research findings.

4. FINDINGS

The findings of this research are based on 17 health co-ops. Twelve are located in rural regions whereas five operate in urban areas. Three have less than a thousand of members, three have more than five thousands of members, and the eleven others are of mid-size. Despite this diversity, all the participating co-ops share a common feature of being under-resourced with regards to staff and money, which is typical of health co-ops in the province of Quebec (Brassard, 2012). This explains why at the time of the data collection and analysis no health co-op was yet offering an ePHR to its members-patients. This being said, each and every of the 17 co-ops were interested in ePHR-based service innovation.

In referring to the two forms of business-IT social alignment developed earlier in this article, we bring together the information gathered and assess the interest of co-ops in innovating with ePHR-based service in the next subsections. We hope to provide insightful findings regarding this proposed IT solution in the healthcare environment. The most substantive quotations from the interviews are provided below for each category in our coding scheme.

4.1. Interest in innovating with ePHR-based service

This first category aims to determine the interest of co-ops to innovate with ePHR-based service. In general, respondents were interested in offering a new service to their members by becoming provider of access to an ePHR. Some substantive quotations of interviews on this theme are presented in table 2.

In sum, there is a strong consensus among health co-ops about ePHR being an interesting base for a new service to offer to members-patients.

4.2. Intra-organizational social alignment

This second category aims to determine the intra-organizational social alignment

Interview quotation	Source
"One of the elements we think that has added value is precisely providing patients [...] a personal health record. This is obviously the element that seems to us the more interesting to develop. […] It's a project that I hope to advance."	General Manager (Co-op A)
"I think ePHR could have its place [in our service offering]. It could be interesting."	General Manager (Co-op B)
"Yes, we would be interested in providing an ePHR service."	General Manager (Co-op C)
"Yes, the ePHR, I think it's absolutely great... I think it should have been done for a long time. […] I find it absolutely fantastic. […] I think the co-op could play the role of a distributor, it might be the point of transmission of this system to the members, the patients ... we could offer them the ePHR. […] Yes, I'm all for the implementation of that service."	Coordinator (Co-op E)
"Offering an ePHR is something that would interest us. […]. It is very interesting."	President (Co-op F)
"Yes, ePHR could be something interesting for the co-op to offer to the members."	President (Co-op G)
"At one point, we had the idea of offering an ePHR and went: Wow! That's interesting! […] It will eventually become a new service."	Coordinator (Co-op J)
"We ask nothing more than to offer an ePHR to our patients. This would be an additional service for our members."	General Manager (Co-op K)
"An ePHR would absolutely be advantageous for our members. It is something that would be interesting."	General Manager (Co-op L)
"For sure ePHR would be an interesting additional service for our members."	Coordinator (Co-op M)
"An ePHR is something that will probably end up a foothold in the co-op over the next few years. […] We know we are heading toward that."	General Manager (Co-op N)
"An ePHR would interest me and my colleagues. We are open to that. Sure it may interest us."	Nurse (Co-op O)

Table 2: Evidence of interest in innovating with IT-based service.

with ePHRs in health co-ops. In general, respondents consider that their co-ops have a mission of prevention as much as of care, and that ePHRs could encourage the involvement of members-patients in their own health, that is empowering them. Some substantive quotations of interviews on this theme are presented in table 3.

Interview quotation	Source
"Basically, the mission of a health co-op is to oversee everything that pertains to prevention. We must better equip members who are increasingly interested in managing their health. It is the patient's responsibility, I think, to have full control, possession of her/his personal health record. It is completely consistent with our mission. That's what I like about this idea of ePHRs. Co-op members should truly be more interested in their health than the average patient because they are looking for something more. EPHRs, it's the democratization of the medical record… that is, whose record is it, the physician's or the patient's? And from my perspective, the medical record should belong to the patient."	General Manager (Co-op A)
"We do prevention. All that is connected to prevention is appreciated [in health co-ops]. I think that ePHRs could empower the patients very much with respect to their state of health."	General Manager (Co-op C)
"If it allows people to improve their quality of life, their health, then there you go! Basically, what I am telling you is that if this responds to the co-op's mission, I have no problems with [offering an ePHR]."	General Manager (Co-op H)
"This co-op is a project that involves members taking control of their own health. […] People here have a big sense of ownership. The ePHR emerged quickly as a way to be in control and to provide us with an appropriate tool.	Coordinator (Co-op J)
"I think that the ePHR is really a tool which would help us increase patient's empowerment. I think that's really the most important element. That's the philosophy of health co-ops. We see some alignment with the mission of co-ops."	General Manager (Co-op N)
"What stands out for me about ePHRs is the benefit that the patient could have, in the sense of the empowerment of the patient. We like to help patients to take control of their own health."	General Manager (Co-op P)
"The ePHR is interesting because we face two major challenges, prevention and health promotion. The ePHR fits well with regard to these two issues there. […] For sure ePHR would be super interesting. This is really going with [...] the empowerment of people."	Coordinator (Co-op Q)

Table 3: Evidence of intra-organizational social alignment.

In general terms, participants judge that the purpose of ePHRs corresponds to the mission of health co-ops. There seems to be a certain degree of intra-organizational social alignment between the mission of health co-ops and the purpose of ePHRs, with both aiming to empower patients.

4.3. Inter-organizational social alignment

This third category aims to determine the inter-organizational social alignment of health co-ops with the open source ePHR development communities.

Overall, the choice of a business partner to provide the ePHR is very significant because it comes back to favoring a type of philosophy. Some substantive quotations of interviews on this theme are described in table 4.

Interview quotation	Source
"The open source development community would be better because it would be familiar with the co-op philosophy and so it could perhaps help us more readily."	Coordinator (Co-op D)
"For sure, we would prefer an open source development community. We believe in the co-op solution."	President (Co-op G)
"It is certain that if we can promote cooperation, we favor an open source community. [...] I think they are ... much in the same boat as the rest of us. [...] They have the same issues as the rest of us."	Coordinator (Co-op I)
"A danger of having a private firm developing the ePHR is that after it might be sold or suddenly disappear. In this world, there are many private companies that offer services and new products appearing and disappearing. It may be important that the ePHR remains collective ownership. It belongs to the people. It can't be resold in the market to a higher bidder. There is an alignment between the values of co-ops and open source communities. For example, the fact that need takes precedence over the company's profitability. I think that in terms of values, it keeps the member at the center of decision-making. There are some important parallels there. There is the fact that you cannot resell the asset to a higher bidder because you make sure that the system, the mission is always preserved. There is a form of guarantee in that. We ourselves identify with those values of open source communities that match the values of health co-ops. The open source approach provides the opportunity of being more in control and being less subject to market logic, of being more subject to the reasoning of needs."	Coordinator (Co-op J)
"For sure, I am leaning toward the co-op option. Because we are a co-op. [...] We have a will to help, to participate in the development of a community project more than about how much money it will bring the end of the week. [...] An open source development community would have like the same philosophy as us. We work on the non-profit, to be able to render service to the surrounding community at a lower cost. [...] So, basically, this is really the philosophy behind the business model."	General Manager (Co-op L)
"An open source community to develop the ePHR, like a health co-op is not there to make money. We share the same philosophy. It is there to provide a service. It is really a service for citizens."	Coordinator (Co-op M)
"We will choose the open source development community because they are our equals. We will go for something closer to our co-op values."	General Manager (Co-op N)
"Ideologically, our reaction would be to adopt a solution coming from an organization with a similar spirit. Sure, we would choose to work with an open source development community."	Coordinator (Co-op Q)

Table 4: Evidence of inter-organizational social alignment.

This preponderance of values and of the philosophical aspect in the choice of provider shows that health co-ops would prefer to collaborate with an open source development community, rather than other potential partners. Therefore, there is a form of inter-organizational social alignment between health co-op and open source development communities.

4.4. Barriers to the bi-alignment approach or evidences of structural "unreadiness"

Findings from the interviews with the health co-ops suggest that they would be favorably disposed both to offer an ePHR-based service to their patients, and to collaborate with a provider with a common philosophy. However, important barriers that we had not foreseen exist in health co-ops and have emerged from our data. Some interview quotations on this matter are described in table 5.

In general, health co-ops do not have the resources, in terms of time or money, to develop, implement and manage an ePHR-based service and a partnership with an open source ePHR development community.

5. DISCUSSION

The two main objectives of this research were to assess the applicability of ePHR-based service innovation in health co-ops and explore the effects of business-IT social alignment on IT-based service innovation in healthcare organizations. Before discussing our findings, some limitations inherent to qualitative studies need to be addressed. We acknowledge the fact that some biases may have been introduced due to the perceptual, as opposed to factual, nature of the data collected. Relying on the perceptions of key informants in health co-ops could also imply cognitive biases. However, the unavailability of factual data as well as a constructionist view of organizational life – given that health co-ops base their decisions and actions on subjective internal and external environments rather than on non-existing objective ones – explain the choice of perceptual data in the present study (Weick, 1979). Moreover, as mentioned earlier, we were studying an *eventual* as opposed to actual reality.

5.1. Applicability of open source ePHR-based service innovation in health co-ops

The results of our analysis support the interest of the health co-ops for some innovation realized with IT-based service such as ePHR application. The interviewees have reported that such application would empower co-ops' members in order to better manage their own health, which is well aligned with co-ops' key mission. Thus, the intra-organizational social alignment that we initially thought of has been revealed by our findings.

The choice of an open source development community for the development and evolution of IT on which services could be based also fits very well with the health co-ops because of their shared values. The results of our interviews indicate that there is a high potential for a viable partnership between health co-ops and open source development communities to offer an innovative ePHR-based service. Our findings have revealed the inter-organizational alignment that we thought could exist and be needed to facilitate IT-based service innovation in health co-ops.

Interview quotation	Source
"It always depends on the time that would be required. It's absolutely certain that the more you add on things like ePHRs, to administration, it takes time. More people to manage all that, that whole business. You'd have to see… you'd have to see if it was all worth it."	General Manager (Co-op H)
"This new service must not increase the workload. […] But again, it is all a question of funding. If I need someone full-time to do that, presently, I don't have the funding for that."	General Manager (Co-op B)
"There is no time to add new tasks. There is a lack of money for new projects."	General Manager (Co-op C)
"We don't have enough employees, we don't have time."	President (Co-op G)
"As we are in deficit since our opening, we can't add additional costs in terms of staff. [...] It would depend on the load that would be incurred for this project. That's what will make the difference. Because we are small and operate with limited means, there is no staff that has time for that."	Coordinator (Co-op I)
"The concern would be that it adds work. [...] We already have plenty of projects. [...] The costs of such a new service frighten us because like it or not, it takes money to develop it."	General Manager (Co-op K)
"It must not increase the workload. We do not have time. Everyone is already working at maximum capacity."	General Manager (Co-op N)
"Time and money are still barriers. Anyway, in our current state, an ePHR would be something that would be superfluous. We already have difficulty providing basic services so something more, now, that would be too much. […] We are lacking time. […] One could say that I only see the extra work that such a new service would entail."	General Manager (Co-op P)
"Before developing new things, we must ensure the survival of the co-op. Because we are really in ... we are quite precarious. It works, but there is nothing that ensures sustainability. [...] We are in an area where sometimes the sources of funding can be a little hard to find. [...] We must go according to the reality in which we are. Putting many things in place that we are no longer able to ensure in the future ... it is not desirable."	Coordinator (Co-op Q)

Table 5: Evidence of barriers to innovating with open source ePHR-based service in health co-ops.

However, this IT-based service innovation can only be realized by overcoming some structural obstacles. The respondents insisted on the fact that they operate on limited financial and human resources and they do not necessarily have the time or money to embark into such service and partnership development given their current situation. These results are in line with the situation of non-profit organizations more generally: "The availability of free, reliable, and functional open source software has helped ease budget constraints [Fitzgerald and Kenny, 2004],

one of the leading obstacles for many non-profits to adopt IS" (Zhang *et al.*, 2010). This is a very important indication of the opportunity for health co-ops to partner with open source software development communities that not only have similar values, but that also relate to profit generating in comparable ways. Such opportunity is important to seize in order to foster the implementation of IT tools by co-ops themselves and to develop new IT-based services for members-patients. This could notably help attraction and retention of members in health co-ops. IT can be used by innovative non-profit organizations to offer new services in order to reach a wider public and to gain capability of action and influence (Eynaud, 2006).

We used a social bi-alignment approach for assessing the interest of health co-ops for innovating with open source ePHR-based service. Despite some limitations, our findings reveal that health co-ops are interested in offering to their members-patients access to an ePHR that would be developed by an open source community. The viability of the partnership approach between health co-ops and open source ePHR development communities seems to be possible, at the condition of lowering some structural barriers.

5.2. Effect of business-IT social alignment on IT-based service innovation

Because our second research objective is the exploration of the effect of business-IT social alignment on IT-based service innovation in healthcare organizations, we applied analytical induction to further exploit our data (Ragin, 1994; Robinson, 1951). An exemplar of analytical induction application is the work of Lapointe and Rivard (2005) that was awarded Best Paper in MISQ in 2005.

We have chosen analytical induction since it permits to unearth new constructs and/or new links among constructs that could further the understanding of a new phenomenon and assist the theory-building process (Patton, 2002; Lapointe & Rivard, 2005). It provides an alternative to more classic grounded theory and phenomenological inquiry (Patton, 2002). It is an iterative process that starts from a general theoretical model that will be refined successively based on emerging interpretation of the data. When using analytical induction, there is no need to provide a priori hypotheses or propositions. A framework alone will be sufficient and a good start to guide data collection or, in cases where data are already collected, guide data analysis. Although key constructs are identified, the potential links between them in a particular context need to be discovered (Patton, 2002; Pozzebon *et al.*, 2009). Early identification of possible constructs is only tentative in theory-building; a construct included early may be excluded in the resulting conceptual model (Eisenhardt, 1989; Dubé & Paré, 2003).

When we started the empirical research, we had in mind three constructs that we have introduced in the two previous sections: intra-organizational social alignment, inter-organizational social alignment, and ePHR-based service innovation. We collected the data having the first goal of validating our suggested practical approach to open source ePHR-based service innovation in health co-ops and a secondary goal of discovering potential links between IT-based service innovation and the two types of alignment. Based on the outcome of the meeting to resolve interrater disagreement, i.e. the creation of the new category *barriers to ePHR-based service innovation*, the first two authors identified a mediator

variable between IT-based service innovation and the two types of alignment, namely *organizational readiness for IT-based change*. Moreover, the distinction between *psychological readiness* for IT-based change and *structural readiness* for IT-based change was introduced in the model under development since it became clear that the new category *barriers to open source ePHR-based service innovation* contains evidences of strong barriers of the structural type. Finally, on the basis of the results of data codification by the last author and of theoretical explanations available in the literature, the other three authors identified a missing variable in the model, namely *radicalness of change to values*.

5.3. Toward a conceptual model of IT-based service innovation in healthcare organizations

Given our research findings, we now propose a conceptual model that could be used for further research that not only includes IT-based service innovation and the two notions of alignment already discussed, but also considers the level of readiness of a healthcare organization to innovate with an IT-based service and the radicalness of the change in terms of values (see Figure 2).

The dependent variable in the proposed model is *IT-based service innovation in healthcare organization* and it refers to *the ability of the health care provider to use IT to come up with new services* (Thambusamy & Palvia, 2011).

The notion of *organizational readiness* was brought up during our interviews with key informants in health co-ops although it was not part of our initial framework. We therefore propose to include this important notion into our emergent conceptual model. Organizational researchers and practitioners alike have long acknowledged that organizational readiness is an important antecedent of successful organizational change (Shahrasbi & Paré, 2015; Eby *et al*., 2000). This

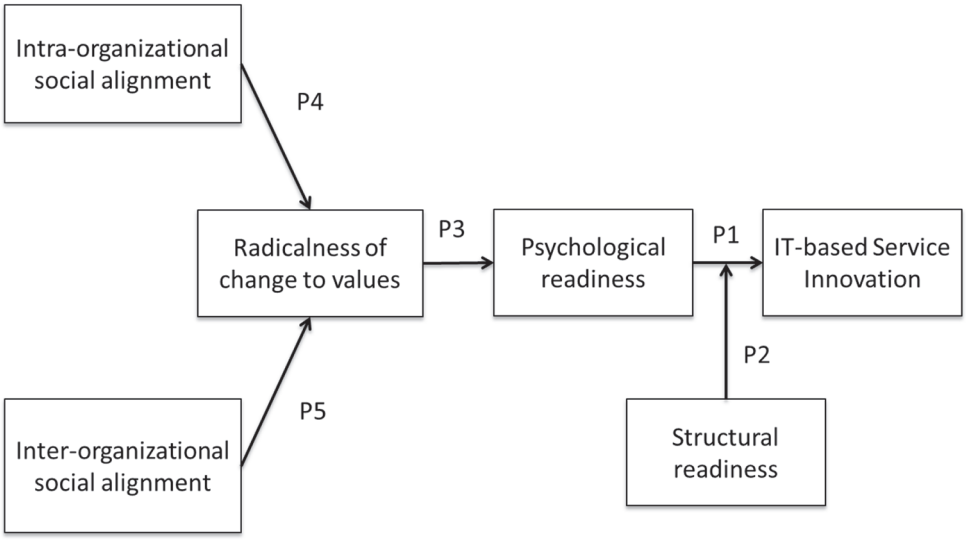

Figure 2: Proposed conceptual model.

concept refers to the extent to which organizational members are psychologically and behaviorally prepared to implement organizational change (Weiner *et al.,* 2008). The IS discipline has borrowed and adapted the organizational readiness concept and has used it in the IT context. Some studies suggest a positive and direct link between organizational readiness and IT implementation success (e.g., Zhu *et al.,* 2010; Gargeya & Brady, 2005), some suggest that this link may be mediated by other variables (e.g., Shahrasbi & Paré, 2015; Croteau & Li, 2003). In all cases, organizational readiness is considered an important concept in the IT transformation context and in any organizational transformation context, including in non-for-profit and healthcare sectors.

The concept of organizational readiness for innovation in health care has been introduced to analyze the general attitude of organizations that are evolving in the health sector vis-à-vis the implementation of innovations (Paré *et al.*, 2014; Williams, 2011). A reconceptualization of organizational readiness was recently proposed by change management and IS scholars (Shahrasbi & Paré, 2014; Holt & Vardaman, 2013). They suggest that organizational readiness has two dimensions, *structural* and *psychological*. In an IT context, psychological readiness refers to "the extent to which the employees of an organization are confident that they have the collective ability and commitment to successfully implement and adopt the proposed organizational transformation" (Shahrasbi & Paré, 2015, p. 3). Structural readiness refers to "the extent to which the required conditions to ensure a successful IT implementation are available and in place or the organization has the capacity to put them in place timely, [namely] essential resources, infrastructure, knowledge, and competencies that are required to undertake the change successfully" (Shahrasbi & Paré, 2015, p. 3).

During our data collection, we quickly realized that the health co-ops were not capable to innovate with open source ePHR-based service even if they were willing to do so. We therefore propose that the two types of organizational readiness for IT-based service innovation are important variables to include in our proposed conceptual model and that they are distinct from IT-based service innovation. We adapt Shahrasbi and Paré's (2015) definitions to our context where the *psychological readiness* for IT-based service innovation is *the extent to which employees in a healthcare organization are confident that they have the collective ability and commitment to successfully implement and adopt the proposed IT-based service innovation*. Going back to the results of our data analysis, this concept is reflected in some parts of evidences of interest in innovating with IT-based service (see table 2), with claims such as "the co-op could play the role of a distributor, it might be the point of transmission of this [ePHR] system to the members" (Coordinator, Co-op E) and "[w]e are open to [innovating with ePHR]" (Nurse, Co-op O). *Structural readiness* for IT-based service innovation is *the extent to which the required conditions to ensure a successful IT-based service innovation implementation are available and in place or the healthcare organization has the capacity to put them in place timely*. Going back to the results of our data analysis, this last concept is completely represented in barriers to innovating with open source ePHR service in health co-ops as presented in table 5.

Organizations must be ready to successfully implement a planned organizational change (here the offering of a new IT-based service), but this "potential

does not automatically translate into action" (Weiner *et al.*, 2008, p. 425). Consequently, these authors suggest that organizational readiness reflects both "willingness" (psychological readiness) and "capability" (structural readiness) to change. According to them, both elements are necessary for change to be undertaken. Based on our findings, we found that not only are they both necessary, but that structural readiness acts as a moderator of the relationship between psychological readiness of the co-op and ePHR service innovation. This moderating effect was identified based on the fact that the interviewees spoke first about the high willingness of the actors involved in their co-op to successfully innovate with ePHR, but as the interview progressed they gradually lowered their enthusiasm when they brought structural limitations in the discussion. Many respondents told us that they are willing to innovate, but that as long as the time and budget are lacking, they can't and won't. Therefore, we propose the following:

P1: Psychological readiness for IT-based service innovation positively influences IT-based service innovation.

P2: Structural readiness for IT-based service innovation moderates the strength of the influence of psychological readiness for IT-based service innovation on IT-based service innovation.

Organizational readiness has its roots in the change management literature (Shahrasbi & Paré, 2015). It has long been stated that creating readiness for change is difficult because change generally requires unlearning existing ways of doing things and adopting new approaches and behaviors (Schein, 1996; Lewin, 1947). An innovation can be radical or incremental. Radical and incremental are the two extremes of a "theoretical continuum of the level of new knowledge embedded in an innovation" and where an innovation falls on this continuum depends upon "the degree of departure of the innovation from the state of knowledge prior to its introduction" (Dewar & Dutton, 1986, p. 1423). Here, the state of knowledge pertains to the healthcare organization's values or philosophy before the introduction of the new IT-based service innovation. Thus, we define *radicalness of change to organizational values* as *the degree of departure of the IT-based service innovation from the healthcare organization's values prior to its introduction*. Based on Lewin (1947) and subsequent work such as Schein (1996), we suggest that the more the planned change is radical, the more psychological readiness is difficult to build. We therefore propose the following:

P3: Radicalness of change to organizational values negatively influences psychological readiness for IT-based service innovation.

We have presented a contextual definition of *intra-organizational social alignment* earlier in this article. For the sake of theoretical development, we generalize it here as *the degree to which the values underlying the mission of a healthcare organization is coherent with the values underlying the purpose of an IT on which a service innovation is based in this organization.* Similarly, we generalize the definition of *inter-organizational social alignment* as *the degree to which the foundational values of a healthcare organization are consistent with the core values embedded in the processes and procedures of the developers of the IT on which a service innovation is based in this organization*.

If intra-organizational alignment is high, then potential challenges to the

current organizational values should be low. Similarly, if inter-organizational social alignment is high, challenges to current organizational values should be low. In fact, the gap between the established system of values and the post-change system of values will be lower if alignment is already achieved or almost achieved before the change. This should lower the extent or radicalness of unlearning of existing values and adoption of new ones that Lewin (1947) and Schein (1996) state as necessary for change to occur. This leads us to propose the following:

P4: Intra-organizational social alignment between the healthcare organization and the IT for service innovation negatively influences radicalness of change to organizational values.

P5: Inter-organizational social alignment between the healthcare organization and the developers of the IT for service innovation negatively influences radicalness of change to organizational values.

Here, it is important to mention that these two types of social alignments can exist even before the IT-based service is implemented by the healthcare organization. It can be potential alignments before becoming actual alignments in the organization, similar to Swanson and Ramiller's (1997; 2004) idea that IT innovations can exist as concepts for potential adopters before existing as material artifacts or being acknowledged as such.

CONCLUSION

The originality of this article stems from the joint study of four elements rarely seen together in the academic literature and, we concur with others (e.g. Girard, 2014; Shahrasbi & Paré, 2014; Cram, 2012; Jones *et al*., 2010) each merit more attention in itself: health co-ops, open source ePHR, social values alignment, and the psychological and structural dimensions of organizational readiness. A limitation of our study is in the depth of the findings that could have been enhanced with a multi-theoretic lens and a more interpretive stance. This is a future research avenue that could unveil a more processual than variance model (Markus & Robey, 1988; Paré *et al.*, 2008) of IT-based service innovation in healthcare organizations.

Through this exploratory qualitative research, we nevertheless contribute to practice by showing that health co-ops are well-suited structures for offering IT-based service innovation such as ePHR. Moreover, our findings indicate that open source development communities would be a well-suited partner for health co-ops in innovating with IT-based service. Thus, a second research avenue would be to reflect on how to establish the infrastructures, notably the technical ones, to support ePHRs through the partnerships that could emerge between healthcare organizations and open source development communities. Such a new and innovative service could help to attract and retain members in health co-ops, therefore maximizing their chance of growth and survival. Business and IT managers must nevertheless keep in mind that business-IT alignment and organizational readiness, two important elements for the success of transformation involving IT in the eyes of researchers and practitioners alike (Eby *et al.*, 2000; El-Mekawy *et al.*, 2015), should be attended to when innovating with ePHR-based services and other mission-critical healthcare services based on IT.

Our study contributes to the academic literature on business-IT alignment and organizational readiness. We have shown

the potential for intra- and inter-organizational social alignment, and the existence of the structural and psychological dimensions of organizational readiness for an IT-based change initiative. The organizational readiness construct is relatively new to IS (Shahrasbi & Paré, 2015). Social alignment based on information systems values is also a concept that was very recently developed by Cram (2012). Moreover, while business-IT alignment was often studied a posteriori and measured as realized strategy on the basis of initial expectations (Croteau & Bergeron, 2001; Coltman *et al.* 2015), we focus on potential alignment of, or compatibility between, the organization and the not yet implemented IT innovation (and its surrounding community).

Our research also contributes to the literature on IT-based service innovation. We have theorized on the role of social values alignment in service innovation based on open source IT by offering a new model also involving organizational readiness. This is a response to a call "for a broader conceptualization of service and the development of new ideas and frameworks to explain the potential impact of IT capabilities on how people experience and innovate with service." (Lusch & Nambisan, 2015, p. 156). One research avenue to pursue would be to validate the proposed model with a large number of health co-ops, in other types of healthcare organizations such as hospitals, in non-profit organizations in other sectors, and in organizations in general. We concur with Zhang *et al.* (2010) that non-profit organizations such as the health co-ops we have studied in this article are fruitful research contexts for studying phenomena related to IT and open source software within and beyond non-profit organizations.

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REFERENCES

Agarwal, R.; Angst, C.M.; DesRoches, C.M.; Fischer, M.A. (2010), "Technological viewpoints (frames) about electronic prescribing in physician practices", *Journal of the American Medical Informatics Association*, vol. 17, n° 4, p. 425-431.

Aksulu, A.; Wade, M. (2010), "A Comprehensive Review and Synthesis of Open Source Research", *Journal of the Association of Information Systems*, vol. 11, n° 11, p. 576-656.

Andrews, L.; Gajanayake, R.; Sahama, T. (2014), "The Australian General Public's Perceptions of Having a Personally Controlled Electronic Health Record (PCEHR)", *International Journal of Medical Informatics*, vol. 83, n° 12, p. 889-900.

Ant Ozok, A.; Wu, H.; Garrido, M.; Pronovost, P.J.; Gurses, A.P. (2014), "Usability and Perceived Usefulness of Personal Health Records for Preventive Health Care: A Case Study Focusing on Patients' and Primary Care Providers' Perspectives", *Applied Ergonomics*, vol. 45, n° 3, p. 613-628.

Archer, N.; Fevrier-Thomas, U.; Lokker, C.; McKibbon, K.A.; Straus, S.E. (2011), "Personal Health Records: A Scoping Review", *Journal of the*

American Medical Informatics Association, vol. 18, n° 4, p. 515-522.

Barrett, M.; Davidson, E.; Prabhu, J.; Vargo, S.L. (2015), "Service Innovation in the Digital Age: Key Contributions and Future Directions", *MIS Quarterly*, vol. 39, n° 1, p. 135-154.

Bauwens, M. (2008), "Class and capital in peer production", Capital & Class, vol. 97, n° 1, p. 121-141.

Benkeltoum, N. (2016), "Adoption de l'open source pour la conception de systèmes d'information critiques : le cas Thales", *Systèmes d'Information et Management*, vol. 21, n° 4.

Bergeron, F.; Raymond, L.; Rivard, S. (2004), "Ideal Patterns of Strategic Alignment and Business Performance", *Information & Management,* vol. 41, n° 8, p. 1003-1020.

Brassard, M.-J. (2012), "Portrait des coopératives de santé au Québec", Conseil québécois de la coopération et de la mutualité, Lévis, QC, Canada.

Chan, Y.E.; Huff, S.L.; Barclay, D.W.; Copeland, D.G. (1997), "Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment", *Information Systems Research*, vol. 8, n° 2, p. 125–150.

Chan, Y.E.; Reich, B.H. (2007), "IT alignment: What Have We Learned?", *Journal of Information Technology*, vol. 22, n° 4, p. 297-315.

Chan, Y.E.; Sabherwal, R.; Thatcher, J. (2006), "Antecedents of Strategic IS Alignment: An Empirical Investigation", *IEEE Transactions on Engineering Management*, vol. 53, n° 1, p. 27-47.

Chen, S.-H.; Wen, P.-C.; Yang, C.-K. (2014), "Business concepts of systemic service innovations in e-Healthcare", *Technovation*, vol. 34, n° 9, pp. 513-524.

Choi, N.; Chengalur-Smith, I. (2015), "Characteristics of Open Source Software Projects for the General Population: Reciprocity and Network Effects", *The Journal of Computer Information Systems*, vol. 56, n° 1, p. 22-30.

Choi, N.; Chengalur-Smith, I.; Nevo, S. (2015), "Loyalty, Ideology, and Identification: An Empirical Study of the Attitudes and Behaviors of Passive Users of Open Source Software", *Journal of the Association for Information Systems*, vol. 16, n° 8, p. 674-706.

Coltman, T.; Tallon, P.; Sharma, R.; Queiroz, M. (2015). "Strategic IT alignment: twenty-five years on", *Journal of Information Technology*, vol. 30, n° 2, p. 91-100.

Cram, W.A. (2012), "Aligning Organizational Values in Systems Development Projects", *Management Research Review*, vol. 35, n° 8, p. 709-726.

Croteau, A.-M.; Bergeron, F. (2001) "An Information Technology Trilogy: Business Strategy, Technological Deployment and Organizational Performance", *Journal of Strategic Information Systems,* vol. 10, n° 2, p. 77-99.

Croteau, A.-M.; Li, P. (2003), "Critical Success Factors of CRM Technological Initiatives", *Canadian Journal of Administrative Sciences,* vol. 20, n° 1, p. 21-34.

Cullen, J. (2008), "Catalyzing Innovation and Knowledge Sharing: Librarian 2.0", *Business Information Review*, vol. 25, n° 4, p. 253-258.

DeSanctis, G.; Poole, M.S. (1994), "Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory", *Organization Science*, vol. 5, n° 2, p. 121–147.

Dewar, R.; Dutton, J. (1986), "The Adoption of Radical and Incremental Innovations: An Empirical Analysis", *Management Science*, vol. 32, n° 11, p. 1422-1433.

Dinev, T.; Albano, V.; Xu, H.; D'Atri, A.; Hart, P. (2016), "Individuals' Attitudes Towards Electronic Health Records: A Privacy Calculus Perspective", In Gupta, A. *et al*. (Eds), *Advances in Healthcare Informatics and Analytics*. Springer: Switzerland.

Dubé, L.; Paré, G. (2003), "Rigor in Information Systems Positivist Case Research: Current Practices, Trends, and Recommendations", *MIS Quarterly*, vol. 27, n° 4, p. 597-636.

Dunn, J.R. (1988), "Basic Cooperative Principles and their Relationship to Selected Practices". *Journal of Agricultural Cooperation*, vol. 3, n° 1, p. 83-93.

Eby, L.T.; Adams, D.M.; Russell, J.E.; Gaby, S.H. (2000), "Perceptions of organizational readiness for change: Factors related to employees' reactions to the implementation of team-based selling", *Human relations*, vol. 53, n° 3, p. 419-442.

Eisenhardt, K.M. (1989). "Building Theories from Case Study Research", *Academy of Management Review*, vol. 14, n° 4, p. 532-550.

El-Mekawy, M.; Rusu, L.; Perjons, E. (2015), "An evaluation framework for comparing business-IT alignment models: A tool for supporting collaborative learning in organizations", *Computers in Human Behavior*, vol. 51, October, p. 1229-1247.

Eynaud, P. (2006). "La gouvernance des organisations à but non lucratif et les technologies de l'information et de la communication", *Systèmes d'Information et Management*, vol. 11, n° 1, p. 23-44.

Fitzgerald, B. (2006), "The Transformation of Open Source Software", *MIS Quarterly*, vol. 30, n° 3, p. 587-598.

Fitzgerald, B.; Kenny, T. (2004), "Developing an Information Systems Infrastructure with Open Source Software", *IEEE Software*, vol. 19, nº 1, p. 50-55.

Gargeya, V.B.; Brady, C. (2005), "Success and failure factors of adopting SAP in ERP system implementation", *Business Process Management Journal*, vol. 11, n° 5, p. 501-516.

Gerow, J.E.; Thatcher, J.B.; Grover, V. (2014), "Six Types of IT-Business Strategic Alignment: An investigation of the constructs and their measurement", *European Journal of Information Systems*, vol. 24, n° 3, p. 1–27.

Gillham, B. (2000), "Case study research methods", Continuum, London, UK.

Girard, J.P. (2014), "How are Co-ops and Mutuals Boosting Innovation & Access Worldwide? An International Survey of Co-Ops and Mutuals at Work in the Health and Social Care Sector," *The Canadian CED Network*, Montreal, QC, Canada.

Gosain, S. (2003), "Looking through a Window on Open Source Culture: Lessons for Community Infrastructure Design", *Systèmes d'Information et Management*, vol. 8, n° 1, p. 11-42.

Gutierrez, O.; Zhang, W. (2007), "Information Systems Research in the Nonprofit Context: A New Frontier", Proceedings *of the Americas Conference on Information Systems*, Keystone, Colorado, USA.

Hartley, J. (2004), "Case Study Research", in: C. Cassell, G. Symon (Eds.), *Essential Guide to Qualitative Methods in Organizational Research*, Sage, London, UK, p. 323-333.

Hébert, R.; Prémont, M.C. (2010), "Les coopératives santé: entre compétition commerciale et solidarité sociale", Revue juridique Thémis, vol. 44, n° 3, p. 273-323.

Henderson, J.C.; Venkatraman, N. (1993), "Strategic Alignment: Leveraging Information Technology for Transforming Organizations", *IBM Systems Journal*, vol. 32, n° 1, p. 4-16.

Holt, D.H.; Vardaman, J. (2013). "Toward a comprehensive understanding of readiness for change: The case for an expanding conceptualization", *Journal of Change Management*, vol. 13, nº 1, p. 9-18.

Huba, N.; Zhang, Y. (2012), "Designing Patient-Centered Personal Health Records (Phrs): Health Care Professionals' Perspective on Patient-Generated Data", *Journal of Medical Systems*, vol. 36, n° 6, p. 3893-3905.

International Co-operative Alliance (2015), "Co-operative Principles", *ICA Review*, vol. 88, n° 4, http://www.uwcc.wisc.edu/icic/orgs/ica/pbs/review/ICA-Review-Vol--88-No--4--19951/Co-operative-Principles--ICA-Review-19951.html. [last accessed February 19, 2016]

Janamanchi, B.; Katsamakas, E.; Raghupathi, W.; Gao, W. (2009), "The state and profile of open source software projects in health and medical informatics", *International Journal of Medical Informatics*, vol. 78, n° 7, p. 457-472.

Jin, L.; Robertson, B. (2008), "Lessons learned from the development and marketing of Mozilla Firefox browser", Proceedings of the Americas Conference on Information Systems, Toronto, ON, Canada.

Johansen, M.A.; Henriksen, E. (2014), "The Evolution of Personal Health Records and their Role for Self-Management: A Literature Review", *Studies in Health Technology and Informatics*, vol. 205, n° 1, p. 458-462.

Jones, D.A.; Shipman, J.P.; Plaut, D.A.; Selden, C.R. (2010), "Characteristics of Personal Health Records: Findings of the Medical Library Association/National Library of Medicine Joint Electronic Personal Health Record Task Force",

Journal of the Medical Library Association, vol. 98, n° 3, p. 243-249.

Karpovsky, A.; Galliers, R.D. (2015), "Aligning in practice: from current cases to a new agenda", *Journal of Information Technology*, vol. 30, n° 2, p. 136-160.

Kearns, G.S.; Lederer, A.L. (2003), "A Resource-Based View of Strategic IT Alignment: How knowledge sharing creates competitive advantage", *Decision Sciences*, vol. 34, n° 1, p. 1-30.

Kerns, J.W.; Krist, A.H.; Longo, D.R.; Kuzel, A.J.; Woolf, S.H. (2013), "How Patients Want to Engage with their Personal Health Record: A Qualitative Study", *BMJ Open*, vol. 3, n° 7, e002931.

Kopanitsa, G.; Taranik, M. (2014), "Applying Open Source Data Visualization Tools to Standard Based Medical Data", *Studies in Health Technology and Informatics*, vol. 200, n° 1, p. 155-157.

Krukowski, A.; Barca, C.; Vogiatzaki, E.; Rodríguez, J. (2014), "Patient Health Record (PHR) System", in: K. Maharatna, S. Bonfiglio (Eds.) *Systems Design for Remote Healthcare*, Springer, New York, NY, p. 173-200.

Lafky, D.B.; Horan, T.A. (2011), "Personal Health Records: Consumer Attitudes Toward Privacy and Security of their Personal Health Information", *Health Informatics Journal*, vol. 17, n° 1, p. 63-71.

Lapointe, L.; Rivard, S. (2005), "A Multilevel Model of Resistance to Information Technology Implementation", *MIS Quarterly*, vol. 29, n° 3, p. 461-491.

Lerdahl, E. (2008), "Staging for Creative Collaboration in Design Teams: Models, tools and methods", VDM, Saarbrücken, Germany.

Lee, M.L.; Davis, J. (2003). "Evolution of Open Source Software: A Study on the Samba Project", *Systèmes d'Information et Management*, vol. 8, n° 1, p. 43-62.

Lewin, K. (1947), "Frontiers in Group Dynamics: Concept, Method and Reality in Social Science; Social Equilibria and Social Change", *Human Relations*, vol. 1, n° 1, p. 5-41.

Lusch, R.F.; Nambisan, S. (2015), "Service Innovation: A Service-Dominant Logic Perspective", *MIS Quarterly*, vol. 39, n° 1, p. 155-175.

Lusch, R.F.; Vargo, S.L. (2014), "Service-Dominant Logic: Premises, Perspectives, Possibilities", Cambridge University Press, Cambridge, UK.

Lyytinen, K.; Rose, G. (2003), "The Disruptive Nature of Information Technology Innovations: The Case of Internet Computing in Systems Development Organizations", *MIS Quarterly*, vol. 27, n° 4, p. 557-595.

Markle Foundation (2003), "Connecting for Health", New York, NY, USA, p. 58.

Markus, M.L.; Robey, D. (1988), "Information technology and organizational change: causal structure in theory and research", *Management Science*, vol. 34, n° 5, p. 583-598.

Marsan, J.; Pascot, D. (2014), "Le dossier de santé personnel informatisé: Une conceptualisation communautaire multi-niveau (Abridged version)", *Annual Conference of the Administrative Sciences Association of Canada*, Muskoka, ON, Canada, p. 101-106.

McLean, E.R.; Soden, J.V. (1977), "Strategic planning for MIS", Wiley, New York, USA.

Monkman, H.; Kushniruk, A. (2013), "Considerations for Personal Health Record Procurement", *Studies in Health Technology and Informatics*, vol. 183, n° 1, p. 308-313.

Nazi, K.M. (2010), "Veterans' Voices: Use of the American Customer Satisfaction Index (ACSI) Survey to Identify my Healthevet Personal Health Record Users' Characteristics, Needs, And Preferences", *Journal of the American Medical Informatics Association*, vol. 17, n° 2, p. 203-211.

Novkovic, S. (2008), "Defining the Co-Operative Difference", *The Journal of Socio-Economics*, vol. 37, n° 6, p. 2168-2177.

Oh, W.; Pinsonneault, A. (2007), "On the Assessment of the Strategic Value of Information Technologies: Conceptual and analytical approaches", *MIS Quarterly*, vol. 31, n° 2, p. 239-265.

Or, C.K.; Karsh, B.T.; Severtson, D.J.; Burke, L.J.; Brown, R.L.; Brennan, P.F. (2011), "Factors Affecting Home Care Patients' Acceptance of a Web-Based Interactive Self-Management Technology" *Journal of the American Medical Informatics Association*, vol. 18, n° 1, p. 51-59.

Ordanini, A.; Rubera, N. (2010), "How Does the Application of an IT Service Innovation Affect Firm Performance? A Theoretical Framework and Empirical Analysis on E-Commerce", *Information and Management*, vol. 47, n° 1, p. 60-67.

Palvia, S.C.; Palvia, P.; Xia, W.; King, R.C. (2011), "Critical Issues of IT Outsourcing Vendors in India" *Communications of the Association for Information Systems*, vol. 29, n° 1, p. 204-220.

Paré, G.; Bourdeau, S.; Marsan, J.; Nach, H.; Shuraida, S. (2008), "Re-examining the causal structure of information technology impact research", *European Journal of Information Systems*, vol. 17, nº 4, p. 403–416.

Paré, G.; Raymond, L.; Ortiz de Guinea, A.; Poba-Nzaou, P.; Trudel, M.-C.; Marsan, J.; Micheneau, T. (2014), "Barriers to Organizational Adoption of EMR Systems in Family Physician Practices: A Mixed-Methods Study in Canada" *International Journal of Medical Informatics*, vol. 83, n° 8, p. 548-558.

Patton, M.Q. (2002), "Qualitative Research & Evaluation Methods", 3rd ed.; Sage Publications, Thousand Oaks, USA.

Pijpers, V.; deLeenheer, P.; Gordijn, J.; Akkermans, H. (2012), "Using Conceptual Models to Explore Business-ICT Alignment in Networked Value Constellations: Case Studies from the Dutch Aviation Industry, Spanish Electricity Industry and Dutch Telecom Industry" *Requirements Engineering*, vol. 17, n° 3, p. 203-226.

Pozzebon, M.; Diniz, E.; Jayo, M. (2009), "Adapting the Structurationist View of Technology for Studies at the Community / Societal Levels", In Dwivedi, Y.K. *et al*. (Eds), *Handbook of Research on Contemporary Theoretical Models in Information Systems*. Information Science Reference: Hershey, NY, USA.

Pyburn, P.J. (1983), "Linking the MIS Plan with Corporate Strategy: An exploratory study", *MIS Quarterly*, vol. 7, n° 2, p. 1–14.

Ragin, C.C. (1994), "Constructing Social Research: The Unity and Diversity of Method", Pine Forge Press, Thousand Oaks, USA.

Raymond, E. S. (1999). The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary. O'Reilly Media, Sebastopol, CA.

Raymond, L.; Pare, G.; Maillet, E. (2015). "IT-enabled Knowledge Management in Primary Care Settings: An Absorptive Capacity Perspective", *Proceedings of the International Conference on Information Systems*, Fort Worth, TX, USA.

Richardson, S.M.; Parrish, J.L.; Rosenthal, D.A. (2011), "Toward a Theory of Emergent Leadership for Collaborative Information Systems Development among Social Enterprises", *Proceedings of the Americas Conference on Information Systems*, Detroit, Michigan, USA.

Robinson, W.W. (1951), "The Logical Structure of Analytic Induction", *American Sociological Review*, vol. 16, n° 6, p. 812-818.

Reich, B.H.; Benbasat, I. (1996), "Measuring the Linkage between Business and Information Technology Objectives", *MIS Quarterly*, vol. 20, n° 1, p. 55-81.

Reich, B.H.; Benbasat, I. (2000), "Factors that Influence the Social Dimension of Alignment between Business and Information Technology Objectives" *MIS Quarterly*, vol. 24, n° 1, p. 81-113.

Sabherwal, R.; Chan, Y.E. (2001), "Alignment between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders", *Information Systems Research*, vol. 12, n° 1, p. 11-33.

Sahlins, M. (2013), "Culture and Practical Reason", University of Chicago Press, Chicago, IL, USA.

Schein, E.H. (1996), "Kurt Lewin's Change Theory in the Field and in the Classroom: Notes Towards a Model of Managed Learning", *Systems Practice*, vol. 9, n° 1, p. 27-47.

Shahrasbi, N.; Paré, G. (2014), "Rethinking the Concept of Organizational Readiness: What Can IS Researchers Learn from the Change Management Field?", *Proceedings of the Americas Conference on Information Systems*, Savannah, GA, USA.

Shahrasbi, N.; Paré, G. (2015), "Inside the 'Black Box': Investigating the Link between Organizational Readiness and IT Implementation Success", *Proceedings of the International Conference on Information Systems*, Fort Worth, TX, USA.

Somner, J.E.; Sii, F.; Bourne, R.; Cross, V.; Shah, P. (2013), "What do Patients with Glaucoma Think about Personal Health Records?", *Ophthalmic and Physiological Optics*, vol. 33, n° 6, p. 627-633.

Stewart, K.J.; Gosain, S. (2006), "The Impact of Ideology on Effectiveness in Open Source Software Development Teams", *MIS Quarterly*, vol. 30, n° 2, p. 291-314.

Swanson, E.B.; Ramiller, N.C. (1997), "The Organizing Vision in Information Systems Innovation", *Organization science*, vol. 8, n° 5, p. 458-474.

Swanson, E.B.; Ramiller, N.C. (2004), "Innovating Mindfully with Information Technology", *MIS Quarterly*, vol. 28, n° 4, p. 553-583.

Tan, F.B.; Gallupe, B.R. (2006), "Aligning Business and Information Systems Thinking: A Cognitive Approach", *IEEE Transactions on Engineering Management*, vol. 53, n° 2, p. 223-237.

Thambusamy, R.; Palvia, P.C. (2011), "IT-based Capabilities, Service Innovation, and Quality in Health Care", *Proceedings of the International Conference on Information Systems*, Shanghai, China.

Toivonen, M.; Tuominen. T. (2009), "Emergence of Innovations in Services", *The Service Industries Journal*, vol. 29, n° 7, p. 887-902.

Tzeng, H.M.; Yin, C.Y.; Fitzgerald, K. (2015), "Engaging Patients in Their Care Versus Obscurantism", *Nursing Forum*, vol. 50, n° 3, p. 196-200.

Ullah, A.; Lai, R. (2013), "A Systematic Review of Business and Information Technology Alignment", *ACM Transactions on Management Information Systems*, vol. 4, n° 1, Article no. 4.

Umapathy, K.; Huang, H. (2015), "A Preliminary Study of Information Technologies Usage in Nonprofit Organizations", *Proceedings of the Americas Conference on Information Systems*, Puerto Rico.

Valdez, R.S.; Brennan, P.F. (2015), "Exploring Patients' Health Information Communication Practices with Social Network Members as a Foundation for Consumer Health IT Design", *International Journal of Medical Informatics*, vol. 84, n° 5, p. 363-374.

Weick, K.E. (1979), "The Social Psychology of Organizing", 2 ed., Addison-Wesley, Reading, MA, USA.

Weiner, B.J.; Amick, H.; Lee, S.Y.D. (2008), "Conceptualization and Measurement of Organizational Readiness for Change: A Review of the Literature in Health Services Research and Other Fields", Medical Care Research and Review, vol. 65, n° 4, p. 379-436.

Williams, I. (2011), "Organizational Readiness for Innovation in Health Care: Some Lessons from the Recent Literature", *Health Services Management Research*, vol. 24, n° 4, p. 213-218.

Wynia, M.K.; Torres, G.W.; Lemieux, J. (2011), "Many Physicians are Willing to Use Patients' Electronic Personal Health Records, but Doctors Differ by Location, Gender, and Practice", *Health Affairs*, vol. 30, n° 2, p. 266-273.

Yackel, T.R. (2001), "How the Open-Source Development Model Can Improve Medical Software", *Studies in Health Technology and Informatics*, vol. 84, n° 1, p. 68-72.

Yayla, A.A.; Hu, Q. (2012), "The Impact of IT-Business Strategic Alignment on Firm Performance in a Developing Country Setting: Exploring moderating roles of environmental uncertainty and strategic orientation", *European Journal of Information Systems*, vol. 21, n° 4, p. 373–387.

Yin, R. (2003), "Case Study Research: Design and Method", Sage, Thousand Oaks, CA, USA.

Zeuli, K.A.; Cropp, R. (2004), "Cooperatives: Principles and Practices in the 21st Century", University of Wisconsin Extension, Madison, USA.

Zhang, W.; Gutierrez, O.; Mathieson, K. (2010), "Information Systems Research in the Nonprofit Context: Challenges and Opportunities", *Communications of the Association for Information Systems*, vol. 27, n° 1, p. 1-12.

Zhu, Y.; Li, Y.; Wang, W.; Chen, J. (2010), "What leads to post-implementation success of ERP? An empirical study of the Chinese retail industry", *International Journal of Information Management*, vol. 30, n° 3, p. 265-276.

APPENDIX

Interview Guide

First, introduce yourself and explain your role within the co-op.

You may know that some healthcare organizations offer electronic personal health records (explain if necessary) to their patients. Would your co-op be interested to offer such an IT-based tool to the members? If yes, why? If not, why?

If the interviewee has not talked about the fit between the purpose of ePHRs and the mission of health co-ops, then ask:

Could an ePHR help your co-op to fulfill its mission? If yes, why? If not, why?

Would your co-op prefer a private organization, governmental organization, non-profit organization, open source community (explain if necessary), or other type of organization (ask to specify), to be the developer and maintainer of the ePHR, and why?

If the preference is for an open source community and the interviewee has not talked about the fit between the values of such a community and the values of health co-ops, then ask:

Do open source communities and health co-ops share the same or similar values? Does it influence your co-op's preference for an open source community to develop and maintain the ePHR?

What values does your co-op look for in partners in general? In suppliers in general? In information technology supplier(s)?

What values would your co-op look for in a developer and maintainer of the ePHR?

Do you wish to share any reminding thoughts about the themes addressed during the interview?