

Through Technology and Shared Knowledge Social Capital of Resources Inspire Innovation

Anjum Razzaque^a, ^aAssociate Professor, MIS Department Chair, College of Business & Finance Ahlia University, Manama, Kingdom of Bahrain, Email: arazzaque@ahlia.edu.bh

Patients demand improved healthcare quality, which is possible through healthcare innovations. Although the literature reports ample healthcare innovations, these changes come with obstacles that complicate their adoption and use. The study's analyses the effect of social capital in a virtual environment on innovation mediated by sharing of knowledge and information and communication technology. Various journal articles were reviewed for this study. All industries, including the healthcare industry, were reviewed. We propose a conceptual model based on four proposition integrating social capital theory, knowledge sharing, technology, and innovation. No other published research critiques, or even examines the association between social capital, knowledge sharing, and innovation. Such relations have not, however, been empirically evaluated in the healthcare industry. Past literature evidences the need for this study's model in order to narrow the healthcare innovation-based barriers and improve healthcare quality.

Key words: *Social Capital, Knowledge Sharing, Innovation, Healthcare, Virtual Community.*

Introduction

This world is overwhelmed with long-term diseases. Since this industry is complicated by various stakeholders, such as patients, physicians, pharmacies or nurses (Thakur, Hsu, & Fontenot, 2012), there is a demand for improved healthcare services (Coccia, 2012). This industry requires products, systems or technological and service-based innovations (Janssen & Moors, 2013), which are vital, for example, in the case of drug discovery (Coccia, 2012). This is service-oriented, connecting information and communication technology (ICT). Innovation



also helps hyper-competition from their marketplace (Rosenberg-Yunger et al., 2008; van Riel et al., 2004).

Since a century ago, the healthcare industry (a 2.5 trillion-dollar service industry) has introduced medical innovations (Omachonu & Einspruch, 2010) like retail and wholesale, and in government, education, etc. (Oke, 2007). The healthcare industry has innovatively improved its service quality by (1) scientific advances in curing diseases which, twenty years ago, killed patients, and (2) the introduction of doctors to thousands of medications and technological devices for improving surgical policies thanks to the ICT. Nonetheless, ICT falls short as this industry was reported to use nineteenth century practices when delivering twenty-first century medicine. For instance, doctors still take handwritten notes, and patients still pass through multiple CT scans since images are negligently lost: which raises costs.. As a consequence, scholars demand innovative tools like the electronic health record (EHR) system (Jha, 2011).

In the healthcare industry, another problem is that, while it employs innovative systems, these systems do not interact with each other (Jha, 2011). Although innovation in the healthcare industry is deemed to be positive, it is still seen as too complicated when modified. The control of innovation is too complex to change the minds of physicians (Länsisalmi, Kivimäki et al., 2006). On the other hand, certain innovations that are quickly adapted to could get less valuable for others if slowly implemented. Rapidly adapted innovations could be usable by physicians when they want to enjoy them for their apparent validity without concern of associated risks. Such innovations are consumer fads and are aggressively marketed for only profit. Hence, they threaten service quality. Such innovations are adapted to avoid criticism. Innovation is a failure when it lacks clear efficiency (Dixon-Woods et al., 2011). If the healthcare industry is flourishing it is abundant with ample hospital beds making adaptations to innovation easier (Länsisalmi et al., 2006).

It is common in the healthcare industry to not attract market share for disruptive inventions, though they may be cost cutting. Such a move can be advantageous for all healthcare stakeholders (Christensen et al., 2000). For instance, the healthcare industry incurs lower costs through remote systems with less support staff (Larsen, 2008; Christensen et al., 2000; Janssen & Moors, 2013). IT can revolutionize the healthcare industry through virtual community-based knowledge management tools, as well as the application of EHRs: an alternative to the costly paper-based records (Razzaque et al., 2013). Thus, virtual communities like disruptive inventions to blend with EHRs in order to collectively recover the quality of the healthcare industry, in so far that it is practically and empirically evaluated.

The reason for this is that EHRs facilitate the healthcare industry with immediate access to patient records (Omachonu & Einspruch, 2010; Razzaque & Jalal-Karim, 2010) and, when integrated with virtual communities like knowledge management tools, could holistically lower



healthcare costs by one innovation supporting another (Jha, 2011). Moreover, the importance of the EHR being integrated with a knowledge management tool, like a virtual community platform, sets a relationship between the social capital of resources and a network of relations (Wu & Hsu, 2012) with ICT. For example: Wu and Hsu (2012), Rijn et al. (2012), Florida et al. (2002), and various other, have studied such relations, though not in the healthcare context. From another perspective, it is imperative to learn how the social capital of relations aids the individual capacity to invent in order to advance the adaptation to technology (Rijn, Bulte, & Adekunle, 2012). It is important to learn why virtual communities are effective initiatives for improving healthcare services from the prism of individual interaction in order to tap into the social capital of resources from professional networks. This is because future research should assess the effectiveness of healthcare networks (Cunningham et al., 2011; Länsisalmi, Kivimäki, Aalto, & Ruoranen, 2006). Thus, there lies the need to integrate virtual community platforms that are blended with EHRs for improving healthcare quality.

Even though an IT related invention plays a fundamental role in the healthcare industry by supporting diagnostics and treatment, there is scant amount of literature on healthcare innovations and in the service industry overall, despite the fact that the service or manufacturing industry significantly contributes in evolving economies worldwide (Petrou & Daskalopoulou, 2013; Omachonu & Einspruch, 2010; Yang & Hsiao, 2009; Oke, 2007), and the literature even reports an untested relationship between social capital, management style, and innovation capacity/performance (Martínez-Can˜as et al., 2011). Though the literature assesses the adaption of innovation, further assessment is needed on how ideas improve services (Länsisalmi et al., 2006). This is because there remains poorly understood properties of innovation research, which demonstrate an unclear understanding of how the social capital of resources affect innovation capacity (Rijn et al., 2012). It is, however, clear that innovation is knowledge-oriented and helps achieve competitive advantage where knowledge is tapped from the social capital of resources (Martínez-Can˜as et al., 2011). Thus, this study proposes its Figure 1 model depicting four relations: social capital theory → knowledge sharing, social capital theory → using ICT through the application of virtual communities, knowledge sharing → innovation capacity, and using ICT → innovation capacity. The Figure 1's four propositions are well discussed in the past literature (Wu & Hsu, 2012). Before elaborating on the methodology acquired by this study, it is important to grasp key terms as depicted in Table 1.

Table 2: Study's fundamental terms

Definitions of Terms		Implication of Terms
Data versus information:	Data is a codified in databases (Hicks et al, 2007; Riaño, 2009) but, information is organized data in meaningful patterns, for decision support systems (Riaño, 2009; Hicks et al, 2007; Hsia et al., 2006; Bate & Robert, 2002).	Healthcare data and information are patient centred therapies that form a complexly informed structure for use by healthcare professional (Riaño, 2009; Al Nawakda et al., 2008).
Knowledge:	Knowledge is information manipulated from multiple sources, such as physicians, via knowledge management processes (Mansingh, et al., 2009; Hsia et al., 2006). Knowledge, explicit in form is in books (Kalkan, 2008; Hara & Hew, 2007) or tacit knowledge like cultural knowledge (Mohamed, et al., 2006; Hara & Hew, 2007).	Information is shaped into knowledge during interactions and is stored in expert system (Alwis & Hartmann, 2008; Hicks, et al, 2007). Business tools like knowledge management sustain competitive advantage (Antonio & Lemos, 2010). The healthcare industry systematically creates, models, and shares knowledge to enhance patientcare during clinical workflows (Abidi, 2008).
Knowledge Management:	Knowledge management cracks data into information, and information into knowledge, in order to enhance competition (Hsia, et al., 2006). It is classified as: know-what, know-how, and (3) know-why (Riaño, 2009).	
Knowledge Sharing	Knowledge is shared when the benefits out-weigh knowledge loss (Chang & Chuang, 2011). Companies follow standards for sharing explicit knowledge through codification systems while personalization is applied for sharing tacit know-how and best practices (Antonio & Lemos, 2010).	Technology helps share explicit knowledge, but tacit knowledge is shared interpersonally in communities (Chang & Chuang, 2011; Bate & Robert, 2002. Tacit knowledge is acquired from personal experiences (Antonio & Lemos, 2010); through the existing social capital of resources.
Social Capital Theory	Scholars who study sociology, economic or political science apply a concept referred as " <i>Social Capital</i> " that explains why communities collectively resolve problems while bringing a community together on one	Physicians participate in VCs by sharing knowledge and in turn the VC stores the shared knowledge as the social capital of resources. These resources add value to the VC of physicians. Also, the shared

	common purpose (Putnam, 1993; Putnam 1995).	knowledge mediates in this phenomenon to facilitate medical decision making (Razzaque et al., 2013).
Virtual Community of Practice (VCs)	Virtual communities are knowledge management tools (Huysman and Wulf 2006) that stem from the specific community of practice: i.e., informal platforms where participants sharing knowledge through experience (Mones, Bautista and Rola 2015), and on virtual environment such as the Internet (Fiol and O'Connor 2005).	One means of knowledge sharing (KS) is in VCs where likeminded participants interact to collectively build the social capital (SC) of resources (Jansen et al. 2011). The HC industry, relies on community shared knowledge for improved patientcare and medical decisions (Lin 2008; Jansen et al. 2011
Medical Decision-Making	Medical decision making is a process of formulating a diagnosis or a treatment plan, based on the information from test, and with the preference of the patient (Razzaque et al., 2013).	In the HC context an, informed DM i.e. evidence based; not experience based. DM, a rational evidenced process drawing on clinical experience; physicians tend to share knowledge through experiences to support peers during clinical DM process (Ciccarese et al. 2005; Nemati et al. 2002; Foong and McGrouther 2010).

Methodology

A thorough review of literature was critiqued. At the outset of this study, the four depicted relations were proposed in the Figure 1 model, which relates social capital through the Social Capital Theory, knowledge sharing, ICT, and innovation capacity/performance, in order to express the notion that the social capital of resources and relation are capable of harnessing innovative capacity in so far that it is mediated by individual participation for the sharing of knowledge and the use of ICT. The use of ICT is predominantly referred in this study as the behaviour of an individual who shares knowledge in order to grasp new knowledge from the social capital of resources stored within a virtual community. As a result, the study's critique of the literature seeks to establish the just-mentioned relations for its on-going research agenda, that is, to mobilizd the four propositions of the Figure 1 of this study from literature. The entire review of literature was extracted from journal articles from ProQuest, Emerald, Science Direct, INDERSCIENCE, just to name a few. The significance of this research project is its motivation, which is, one, underpinned by the need of a holistic assessment of the four propositions of the Figure 1 model and, two, by both the lack of such a model and the ample

evidence in theoretical literature of the need for an empirical assessment of a holistic framework that integrates social capital theory, knowledge sharing, ICT, and innovation.

Literature Review

Innovation Influences the Healthcare Industry

An innovation is the introduction and application of a process, product or idea to the benefit of an individual or a group. An innovation is a novel belief or an application. In the healthcare industry, for instance, an innovation is possible through the introduction of new service/solutions for improved patientcare (Länsisalmi et al., 2006). An innovation is a systematic discipline that applies and creates knowledge for the invention of a new product/process/service, which is shaped by knowledge, and uses technology (Janssen & Moors, 2013). Firms possessing innovative characteristics enable innovation, while also stripping away the relevance of older products (Dombrowski et al., 2007). In the healthcare industry, innovation is in newer work procedures and newer services or technologies for the purpose of improving service quality of patientcare. It does this by balancing cost and quality (Rijn et al., 2012). For instance, medicine and technology can be combined in order to introduce radical and disruptive innovations. For 50 years, technology has revolutionized the healthcare industry through clinical practices, clinicians, and technological breakthroughs. Feedback loops and incremental inventions have improved healthcare efficiency and lowered costs (Coccia, 2012).

The drivers of innovation in the manufacturing and the healthcare industry vary. The healthcare sector fosters innovation through its communication infrastructure, for example, while the manufacturing industry relies on local competencies (Petrou & Daskalopoulou, 2013). Technological innovation facilitates product innovation by introducing new goods and services, as well as process innovation by improving internal processes that produce the goods and aid in improving quality. An innovation becomes an invention implementor of new/modified product/service/process/system/model for adding new customer value. There are four types of innovations: (1) product/service inventions that introduce a new product/service, (2) process invention, which presents a new delivery method, (3) market invention that present a new marketing procedure, and (4) organizational invention, which familiarises a new method to improve relations (Omachonu & Einspruch, 2010; Oke, 2007). Though ample literature discusses the economics of innovation, only a scant amount of literature raises awareness of the technological inventions for improving medicine (Coccia, 2012). Five factors define an innovation: people, ideas, transactions, context, and outcomes (Escalfoni et al., 2011). When people interact with their relations to inspire innovation, and manage the outcomes of an innovation in turn, old ideas can be applied in new contexts to create new solutions/inventions. (Escalfoni et al.,2011).



Virtual Community for Its Social Capital of Resources Ad Relations

The healthcare industry faces changing times. Thus, ICT is needed to keep up with these changes in order to) reduce cost and maintain quality, while also managing a shortage in skilled staff, like nurses. While the US healthcare industry faces changing structure and regulations, the European healthcare industry is facing structural changes by which healthcare professionals have to rely on networks in order to improve their service quality (Länsisalmi et al., 2006). Future research should narrow the gap between scientific evidence and practice during such changing times, which makes innovation critical (Länsisalmi, et al., 2006). SC facilitates innovation capacity by relationship conversions (Martínez-Can˜as et al., 2011). Since a decade ago, innovation changed drastically, and innovators are no longer loner scientists. Innovators collaborate on networks through the trust, reciprocity and norms of their collaborators, that is, within a community capable of creating the social capital of resources (Florida, Cusbing, & Gates, 2002). Therefore, when we seek new knowledge, we can read through the threads of blogs hosted on the Internet. The communication logged in those blogs refers to the social capital of resources.

The Social Capital Theory describes how social capital is built through three dimensions: the first is structural, the second is relational, and the third is cognitive. These dimensions are highly dependent on each another (Wu & Hsu, 2012). Such a theory is a social study characteristic for communities and is based on trust, reciprocity, and communal norms, in the sharing of resources within a particular society (Rijn et al., 2012). Social capital is a summed-up resource that is in, and is available through, the network of relations. Here, the structural dimension reflects the connections of its participants (Pérez-Luño et al., 2011). Network are popular within virtual community platforms. A virtual community is a network on the World Wide Web. Ideas are stored in logs within a virtual community as members interact and bond through a common interest. Virtual communities as a research area caught academic attention when scholars began researching knowledge management topics and examined innovative capacity in virtual environments. Only a scant number of studies, however, shed light on the influence virtual communities have on a firm's innovative capacity (Schröder & Hölzle, 2010).

The structural dimension are the links between participants that raise awareness of who knows what. This dimension aids innovative behaviour when participants acquire knowledge from close relations (Wu & Hsu, 2012). The relational dimension reflects personal relations through interactions that are based on trust, respect, and fraternity (Wu & Hsu, 2012; Pérez-Luño et al., 2011). This is a comparable idea with Pérez-Luño et al., for whom a network of relations generate innovation. The cognitive dimension creates a sense of a common language between participants, who often have different points of view. This reduces communication barriers and creates in turn a positive environment for sharing knowledge. This dimension also creates a sense of a foundational vision, which is based on common goals. These goals inspire and

motivate participants towards sharing resources and to thus harness the innovative capacity (Wu & Hsu, 2012; Pérez-Luño et al., 2011). Based on this argument, we propose that:

Social capital is vital for sharing tacit knowledge when this type of knowledge is difficult to communicate. Therefore, assessing the effect of tacit knowledge on innovative capacity is an important research agenda. Knowledge influences innovative capacity, though little research empirically supports such a statement. Radical inventions are based on interactions which transfer tacit knowledge, while trust, which is unnecessary for sharing explicit knowledge, is vital for the exchange of tacit knowledge through communication, specifically when it pertains to intuition and beliefs, in the production of radical innovations (Pérez-Luño et al., 2011). Various studies see social capital to bridge external relationships and bond participants together for the carving out business strategies (Wu & Hsu, 2012). Social capital facilitates intellectual capital (Gallego, 2010; Wu & Hsu, 2012), while externally supporting supplier relations, and improving the innovative capacity of an organization to build more effective business processes that enhance the global market. In such a network knowledge is embedded, which makes the social capital of resources vital for harnessing innovative behaviours (Wu & Hsu, 2012; Gallego, 2010). Studies contradict this in their empirical findings, putting a question mark beside the above-mentioned phenomenon. The empirical findings of Rijn, et al. (2012) convey that social capital positively and significantly affects innovative capacity through the adaptation of agricultural technologies in Africa by the structural. On the other hand, the cognitive dimension negatively affects innovative capacity. Resource sharing facilitates innovation but the norm of a community discourages innovative behaviour (Rijn, Bulte, & Adekunle, 2012). As a consequence, such a phenomenon needs to be retested in the healthcare sector, as such findings could vary within different industrial contexts.

Though innovative capacity is an individual outcome through a sequence of events (Escalfoni, et al., 2011), future research should investigate how the healthcare industry collaborates with researchers in order to harness innovative capacity (Lämsäsaari, et al., 2006). An organization becomes innovative through the talents of its employees, which is possible through a non-supervised environment during project management, as is the case of the firm 3M (Escalfoni, et al., 2011). Another way an organization fosters innovation is through collaboratively attaining innovative ideas (Dombrowski, et al., 2007) that are based on techniques for improving product/procedure for competitive advantage. Innovation occurs through three elements: ideas, newer practices or artefacts, and outcomes (Escalfoni, et al., 2011). Proctor & Gamble, for instance, connect with commercial and academic researchers for the purpose of developing new products, and realize that they are innovative through the leadership characteristics and experimentalism of their employees, as well as their ideas, which support the enhancement of their innovative capacity (Dombrowski, et al., 2007; Gallego, 2010). Collaboration is the key because success depends on how innovatively a product/service is



sold/executed. Currently, innovations form a scientific culture for problem-solving (Mukherjee, 2014).

This study critiqued the importance of SC and interaction for harnessing innovative capacity because firms are relying on external collaboration to improve their innovation and their competitive advantage in turn (Pérez-Luño et al., 2011). Service based firms need technology, the exchange of knowledge, and virtual networks, in order to harness their innovative capacity (Petrou & Daskalopoulou, 2013). This is because innovation is socially driven by shared learning and knowledge sharing (Pérez-Luño et al., 2011).

Social capital explains the effect of relationships between organizations on innovations. An ample number of studies discuss the positive relationship between inter-organizational collaborative relationships and innovation, facilitating general and radical innovations which benefit the attainment information and the equal distribution of knowledge. A new product innovation is introduced quicker when alliances are established between organizations because social capital enhances general and radical innovations. The idea of having links between individuals within a group is necessary to facilitate radical innovation. The strength of these ties also facilitates innovation (i.e. relational dimension of social capital theory). On the other hand, there is a dark side to the relationship between Social Capital Theory and innovation since the sources of inspiration are limited (Pérez-Luño et al., 2011). Similarly, an assessment of provincial innovation and economic growth, i.e. cities with high social capital, has evidenced low innovation. However, cities with low social capital have displayed high innovation. The explanation for this is that communities with strong ties are too content and isolate themselves from other communities. Such a community thus undermines innovation. A community with weak ties will promote the sharing of knowledge and new ideas (Florida, et al., 2002).

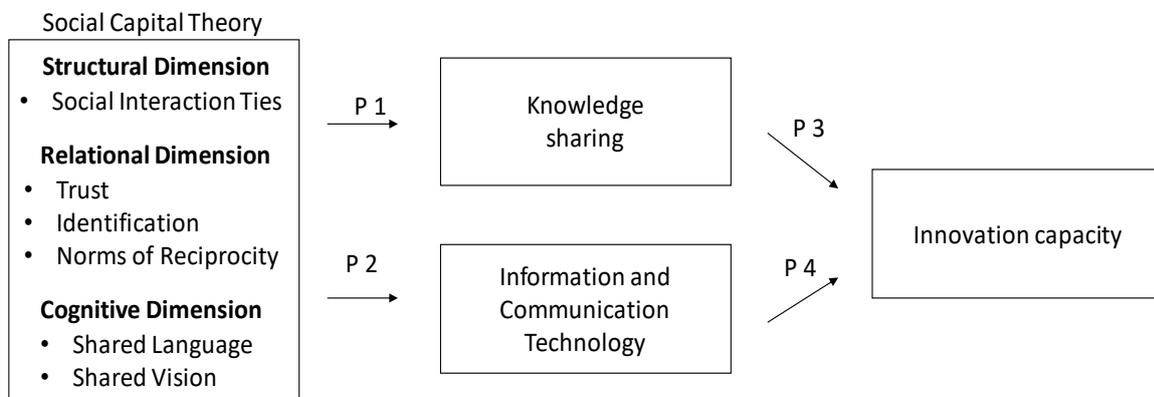
From a management-based research area perspective, the vast body of empirical work that has assessed social capital and innovation stresses the importance of social capital on innovation from the point of view of improving individual, firm, and departmental performance (Hamdan et al., 2020; Gallego, 2010). However, it was observed in the literature that there is yet no empirical evidence exploring the role of knowledge sharing within the context of the healthcare industry. This view is affirmed by (Oke, 2007) who reported that research has not appropriately assessed the relationship between innovation types, management style and innovation performance. Few studies have investigated the innovations of the service and manufacturing industry since such research is fragmented. Another study supported the aforementioned opinion. It stated that the diffusion of information, that is, information or knowledge sharing, is an important moderating variable for reducing market uncertainty in making management decisions by improving innovation (van Riel et al., 2004). Thus, as depicted in Figure 1's proposed solution, social capital supports knowledge sharing, and knowledge sharing synergized with technology. This, in turn, facilitates innovation within a

virtual community environment. This considers that the existing body of scholarship still lacks understanding in regards to the effectiveness of networks in the healthcare industry (Cunningham et al., 2011; Lämsä, Kivimäki, et al., 2006). Figure 1 also expresses the need for virtual communities, in relation with social capital, to assess innovation (Schröder & Hölzle, 2010).

Proposed Solution of this Research

As depicted in Figure 1, social capital from a managerial research perspective is supported by three key factors: the structural dimension, the relational dimension, and the cognitive dimension. These three factors define the knowledge management (KM) infrastructure: i.e. organizational technology, organizational structure and, organizational culture, where technology is crucial for social capital and the creation of new knowledge. Thus, the technology reflects the organizational technological ties, which are facilitated by the KM processes that are: knowledge acquisition, knowledge conversation, knowledge application and knowledge protection (Gold, et al., 2001). As a result, knowledge sharing, i.e. one of the KM processes, encourages the innovate capacity of virtual community members (Razzaque & Hamdan, 2020a; Razzaque & Hamdan, 2020b; Schröder & Hölzle, 2010).

Figure 1. Conceptual framework.



Discussion and Conclusion

The model proposed in Figure 1 represents four propositions: (1) physicians' social capital positively and significantly affects their knowledge sharing behaviour; (2) physicians' social capital positively and significantly affects their use of Information and Communication Technology; (3) physicians' shared knowledge positively and significantly affects their innovative capacity; and (4) physicians' use of Information and Communication Technology positively and significantly affects their innovative capacity. The quality of the healthcare industry can be aided by the innovative capacity of its stakeholders. Although this industry has developed numerous technological devices over the course of the century (Omachonu & Einspruch, 2010; van Riel et al., 2004), the 21st century healthcare industry is still in the 19th century. As a result, innovations like the EHR have proved promising, even though they are expensive (Jha, 2011). Also, implementing healthcare innovations is complicated (Razzaque & Karolak, 2011; Länsisalmi et al., 2006).

Some innovations that are quickly adapted threaten the healthcare industry ((Dixon-Woods et al., 2011) and are unwelcome, even as they represent solutions to improving service quality (Christensen, Bohmer, & Kenagy, 2000). However, if virtual communities and EHR were utilized together, collectively and collaboratively, they can form a solution that will improve healthcare service quality. One reason is that, while EHRs can help the healthcare industry (Razzaque & Karolak, 2011; Omachonu & Einspruch, 2010), the social capital of relations facilitates a virtual community to promote innovation (Wu & Hsu, 2012; Cusbing, & Gates, 2002). Since research is lacking in the area of technological innovations (Coccia, 2012), and that there is still no defined relationship between social capital and innovation (Martínez-Canñas, Sa'ez-Martínez, & Ruiz-Palomino, 2011), there is a need for a future empirical assessment of the service industry (Länsisalmi, Kivimäki, Aalto, & Ruoranen, 2006). IT can revolutionize healthcare in four ways: (1) Greater number of offshore services, e.g. x-rays, specialists' consultation; (2) Integrating healthcare information systems for readily available healthcare information so EHRs can travel with patients; (3) Global monitoring of drug consumption where still no such information is shared between countries; and (4) Greater information quality for patients and physicians, e.g. virtual communities like WebMD for medical resources (Razzaque & Karolak, 2011; Omachonu & Einspruch, 2010).

One limitation of this study is that it could have conducted an even deeper literature review. The authors of this paper anticipate deepening their analysis of the current literature review for a journal publication. Furthermore, in relation to the adaption of innovation in the HC industry, future research could assess the dark role of innovation: for example, the stress felt by innovators when questioning current organizational states, and the way in which they might rock the boat in resistance to the implementation of new innovations (Christensen et al., 2000), and organizational change. This is also an under researched area in the healthcare industry.



Future research could longitudinally assess innovation as a in/dependant variable (Länsisalmi et al., 2006).



REFERENCES

- Coccia, M. (2012). Driving forces of technological change in medicine: Radical innovations induced by side effects and their impact on society and healthcare. *Technology in Society*, 34(4), 271–283.
- Christensen, C. M., Bohmer, R., & Kenagy, J. (2000). Will disruptive innovations cure health care? *arvard business review*, 78(5), 102.
- Cunningham, F. C., Ranmuthugala, G., Plumb, J., Georgiou, A., Westbrook, J. I., & Braithwaite, J. (2011). Health professional networks as a vector for improving healthcare quality and safety: a systematic review. *BMJ*, 21(3), 239-249.
- Dixon-Woods, M., Amalberti, R., Goodman, S., Bergman, B., & Glasziou, P. (2011). Problems and promises of innovation: why healthcare needs to rethink its love/hate relationship with the new. *BMJ*, 20(Suppl_1), i47 - i51.
- Escalfoni, R., Braganholo, V., & Borges, M. R. (2011). A method for capturing innovation features using group storytelling. *Expert Systems with Applications*, 38(2), 1148–1159.
- Florida, R., Cusbing, R., & Gates, G. (2002). When Social Capital Stifles Innovation. *Harvard Business Review*, 80(8), 20.
- Gallego, Á. (2010). Social Capital and Innovation: An Intra-departmental Perspective. *management revue*, 21(2), 135-154.
- Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge Management: An Organizational Capabilities Perspective. *Journal of Management Information Systems*, 18(1), 185-214.
- Janssen, M., & Moors, E. H. (2013). Caring for healthcare entrepreneurs — Towards successful entrepreneurial strategies for sustainable innovations in Dutch healthcare. *Technological Forecasting & Social Change*, 80(7), 1360 - 1374.
- Jha, A. (2011, Feb 5). *21st Century Medicine, 19th Century Practices*. Retrieved Nov 12, 2013, from Harward Business Review: <http://blogs.hbr.org/2011/02/21st-century-medicine-19th-cen/>
- Länsisalmi, H., Kivimäki, M., Aalto, P., & Ruoranen, R. (2006). Innovation in Healthcare: A Systematic Review of Recent Research. *Nursing Science Quarterly*, 19(1), 66-72.
- Larsen, M. G. (2008). Technology in healthcare: leveraging new innovations. *Healthcare executiv*, 23(5), 9.



- Martínez-Canñas, R., Sa´ez-Martínez, F. J., & Ruiz-Palomino, P. (2011). Knowledge acquisition's mediation of social capital-firm innovation. *Journal of Knowledge Management*, 16(1), 61-76.
- Mukherjee, G. S. (2014). Transformation of Innovation Culture Over the Years. 64(1), 3-4.
- Oke, A. (2007). Innovation types and innovation management practices in service companies. *International Journal of Operations &*, 27(6), 564-587.
- Omachonu, V. K., & Einspruch, N. G. (2010). Innovation in Healthcare Delivery Systems: A Conceptual Framework. *The Innovation Journal: The Public Sector Innovation Journal*, 15(1), 1-20.
- Pérez-Luño, A., Medina, C. C., Lavado, A. C., & Rodríguez, G. C. (2011). How social capital and knowledge affect innovation. *Journal of Business Research*, 64(12), 1369–1376.
- Petrou, A., & Daskalopoulou, I. (2013). Social capital and innovation in the services sector. *European Journal of Innovation Management*, 16(1), 50-69.
- Hamdan, A., Khamis, R., Anasweh, M., Al-Hashimi, M., & Razzaque, A. (2019). IT Governance and Firm Performance: empirical study from Saudi Arabia. *SAGE Open*(April-June), 1-7.
- Razzaque, A., & Hamdan, A. (2020). Peak-End Rule Promotes Social Capital for Knowledge Management in Thru Social Internet of Things. In A. E. Hassanien, R. Bhatnagar, N. E. Khalifa, & M. H. Taha, *Toward Social Internet of Things (SIoT): Enabling Technologies, Architectures and Applications*. Springer Nature Switzerland AG.
- Razzaque, A., & Hamdan, A. (2020). Social Networking with Internet of Things Aid Bahraini Medical Professionals' Decisions Through Their Knowledge Sharing. In A. E. Hassanien, R. Bhatnagar, N. E. Khalifa, & M. H. Taha, *Toward Social Internet of Things (SIoT): Enabling Technologies, Architectures and Applications*. Springer Nature Switzerland AG.
- Razzaque, A., & Jalal-Karim, A. (2010). Conceptual Healthcare Knowledge Management Model for Adaptability and Interoperability of EHR. *European, Mediterranean & Middle Eastern Conference on Information Systems (EMCIS 2010)*. Abu-Dhabi, UAE.
- Razzaque, A., & Karolak, M. (2010). Knowledge Management and Electronic Health Record Facilitate Clinical Support to Improve Healthcare Quality. *International Conference on E-business, Management and Economics (ICEME 2010)*. Hong Kong.: IEEE Press, ICEME 2010, 28-30 December.



- Razzaque, A., Eldabi, T., & Jalal-Karim, A. (2013). Physician Virtual Community and Medical Decision-Making: Mediating Role of Knowledge Sharing. *Journal of Enterprise Information Management*, 26(5), 500-515.
- Rijn, F. v., Bulte, E., & Adekunle, A. (2012). Social capital and agricultural innovation in Sub-Saharan Africa. *Agricultural Systems*, 108, 112-122.
- Rosenberg-Yunger, Z. R., Daar, A. S., Singer, P. A., & Martin, D. K. (2008). Healthcare sustainability and the challenges of innovation to biopharmaceuticals in Canada. *Health Policy*, 87(3), 359–368.
- Schröder, A., & Hölzle, K. (2010). Virtual Communities for Innovation: Influence Factors and Impact on Company Innovation. *Virtual Community for Innovation*, 19(3), 257-268.
- Thakur, R., Hsu, S. H., & Fontenot, G. (2012). Innovation in healthcare: Issues and future trends. *Journal of Business Research*, 65(4), 562–569.
- van Riel,, A. C., Lemmink, J., & Ouwersloot, H. (2004). High-Technology Service Innovation Success: A Decision-Making Perspective. *Journal of Product Innovation Management*, 21(5), 348–359.
- Wu, C.-S., & Hsu, Z.-S. (2012). Subsidiary Innovation in Multinational Corporation: Social Capital Perspective. *The Journal of Human Resource and Adult Learning*, 8(2), 65-72.
- Yang, H.-L., & Hsiao, S.-L. (2009). Mechanisms of developing innovative IT-enabled services: A case study of Taiwanese healthcare service. *Technovation*, 29(5), 327–337.