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Communities of practice: Telemedicine and online medical communities

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ABSTRACT

E-health and telemedicine have had limited success across the European Union (EU), but using online collaborative technologies to support a community of practice may enable a sustainable healthcare community. In this paper we introduce a virtual medical community that enables geographically-dispersed medical experts to collaborate and share their knowledge in order to improve health care provision. This research confirms that media richness is not required for sustainable communities of practice, that there is greater effectiveness in knowledge sharing when virtual medical communities develop into communities of practice, and that communities of practice are sustainable when shared knowledge enhances medical practice.

1. Introduction

Collaborative technologies enable communication, coordination and cooperation (Nitchi et al., 2009), can facilitate effective group interaction (Gupta et al., 2009), and can enable distributed groups of people to communicate, structure and share information anytime and anywhere (Bélanger and Allport, 2008). Collaborative technologies and social networking enable social interaction which may be synchronous or asynchronous between actors who are geographically or temporally dispersed.

Rheingold (1993) suggests virtual interactions enabled by computer mediated communication technologies may lead to new community formation and identity expression online. Social networks such as Facebook, Twitter and LinkedIn etc. are a form of virtual community and have gained tremendous popularity. "This new form of virtual community is generally based on Web 2.0 technologies, which aim to further enhance the reciprocity of the social interaction and exchange between community members by encouraging users to add value to the application as they use it" (Zhang, 2010 p1).

The term 'Community of Practice' was coined by Lave and Wenger (1991) and further developed by Wenger (1999) to describe the way that individuals who are united in action, and in the meaning that action has for them and for the larger collective, act collectively for the benefit of individuals within the group as well as the group as a whole. Communities of Practice exist within and outside organisations, may span organisational boundaries, as well as spanning domains of specialist practice and knowledge.

Telemedicine can be defined as a system of healthcare delivery using information and communications technology (ICT) as a substitute for face-to-face contact between provider and client, easing such problems as: limited access to care, especially for the geographically disadvantaged; uneven quality of care; and cost inflation (Bashshur, 1995). However, telemedicine may also be viewed as a collaborative activity amongst medical professionals who communicate and interact virtually due to their geographical dispersion, (Panteli and Sims, 2010), and such activities are therefore technology-mediated. Gröne and Garcia-Barbero (2001) suggest that not only does telemedicine enable the diagnosis and treatment of patients at a distance, but may also be used as "a long-distance training tool for health care professionals".

Communities of practice within telemedicine, using online social networking as an enabling technology, offer the potential to bring together temporally and geographically dispersed actors to work towards a common purpose. A virtual medical community of practice might take the shape of a social network, using collaborative technologies similar to other social networking communities.

The literature suggests that specialist healthcare practitioners in communities of practice that establish professional relationships, share common concerns and sets of problems, can increase their knowledge, enhance practice quality, and increase their confidence in their ability to provide care (Jiménez-Zarco et al., 2014; Meins et al., 2015). In order to sustain a community of practice members must remain motivated in their quest to highlight and share good practice with peers (Ikioda and Kendall, 2016). Such communities can lead to a perception of increased efficiency as well as better communication between professionals and improved care (Díaz-Chao et al., 2014; Jiménez-Zarco et al., 2014). The literature also suggests that online communities of practice where care providers have limited access to communication, or opportunities for consultation, can enable knowledge sharing and lead to

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enhanced practitioner knowledge (Jiménez-Zarco et al., 2014; Meins et al., 2015). This research sets out to test these propositions from the literature and to determine whether or not communication richness or technological complexity is important.

This research studies a group of geographically-dispersed medical experts using collaborative technologies. Their practice involves specialised medicine practiced in isolation, away from colleagues and organisational support. Because the members are geographically-dispersed and operate to a large part in isolation, it was not possible to interview them. The literature suggests that telemedicine is not as well used in Europe as anticipated (May et al., 2003; Thielscher and Doarn, 2008) but where communities of practice do develop their continuity relies on members perceiving that they receive benefits from membership. This research seeks to understand if, when virtual medical communities develop into communities of practice, they become sustainable; if there is greater effectiveness in knowledge sharing; and whether or not shared knowledge enhances medical practice.

The remainder of the paper is structured as follows. The next section discusses online communities. The section after that will discuss communities of practice. The following section introduces the context of the case study: Case 1. The case study will then be used to examine the potential use of an online community to develop a community of practice.

2. Online communities

Informal networks are critical to knowledge creation and sharing (Huysman and De Wit, 2004). Collaborative technologies enable informal networks to interact across geographic and temporal boundaries. The term 'on-line community' encompasses a wide range of Internet fora including markets and auction sites, bulletin boards, listservers, social networking sites, blogs, gaming and shared interest sites (Miller et al., 2009). On-line communities enable asynchronous, immediate, interactive, low cost communication and weblogs offer asymmetric communication (Silva et al., 2008). Stanoevska-Slabeva (2002) suggests that on-line communities are characterised by strong relationships between participants, community-specific structure and modes of discourse, common vocabulary, common meaning, shared history, community rituals, continuity of communication and a common on-line meeting space. She identifies four types of community: discussion or conversation; task- or goal-oriented; virtual worlds; and hybrid communities.

On-line communities provide affiliation, belonging, power, prestige and entertainment (Macaulay et al., 2007). Digital interaction is embedded in, influenced by, and influences, social networks. These online communities can create substantial value for participants, including social support, increased sales, enhanced knowledge and innovation (Agrawal et al., 2008). The biggest challenge for a virtual community is the supply of knowledge (Chiu et al., 2006).

Vidgen et al. (2013) suggest there is ongoing debate about the relationship between networks and communities. For some (on-line) networks are (on-line) communities (Duan, 2009; Lea et al., 2006), for others networks are a mechanism for managing communities (Ganley and Lampe, 2009). Wasko et al. (2009) find similar characteristics in networks as in communities. Online communities can be seen as complex social networks where participants establish connections over time (Panzarasa et al., 2009).

Social networking sites are a type of on-line community that have grown in popularity. Social Networking leads to connection-sharing, social capital generation and effective communication (Boyd and Ellison, 2007). Social Networking sites tend to be structured around a niche audience, which is ideal for the development of communities of practice. Using social networking to build communities of practice is not new, CHIplace and CSCWplace were designed for people involved in the design and use of computer applications (Churchill et al., 2004). For some, community interaction can take place both online and offline, with face-to-face meetings taking place in conferences, seminars, meetings and workshops. The use of face-to-face interaction builds stronger relationships between members and aids in the cohesiveness of virtual groups (Panteli and Duncan, 2004); thus, for many, social networking may be expected to have both online and offline elements.

The online element of social networking may be rich, including text, images, video, sound, or any combination of these. It may be presented in the form of a blog, or webpage, or a fully interactive site. However, the online element may be not be rich, but in the form of text via a forum, a blog, or email. Vidgen et al. (2013) find no link between media used (e.g., video), the content (topics discussed), and community building. Perhaps community building relates more to external reputation, writing style, or topicality.

Panteli and Duncan (2004) suggest that ad-hoc and temporary teams often do not have the time that traditional trust theories see as enabling familiarity amongst team members, promoting trust; but trust is important and needs to develop. However, interactions between key players that can be described as "situated", emerging from the "scripted, pre-scripted, co-scripted, re-scripted and unscripted computer-mediated interactions of virtual players", that "elicit the process of trust development within the temporary setting of virtual teams, constituting a type of trust relationship that is mutually negotiated and jointly constructed" (Panteli and Duncan, 2004 p1). In online communities that are loosely tied, that cannot be described as teams, trust may also be important. In many cases the offline element is an important element of community cohesion. In online communities of practice there may be off-line contact that is important in building familiarity and trust.

Vidgen et al. (2013) suggest that blogs are increasingly popular, yet little researched (Lee and Trimi, 2008; Silva et al., 2006), and there is a paucity of empirical studies about the use of blogs. Blogging is evolving and research that catches reality in flight may be difficult (Lee and Trimi, 2008). A blog is a weblog and consists of online posts by owners and comments (user-generated content) by others. Some blogs are principally a medium for one-way communication, i.e., used for publicity, product promotion, and managing public relations, and, as such, do not lead to community building.

There is however, evidence of communities evolving around blogs (Efimova et al., 2005), with explicit rules regarding membership, moderators, profile information, net etiquette, tacit warrants for discerning pertinent posts and specific techniques of discipline (Miller et al., 2009). There are a number of sub-types of online community: relationship – usually groups clearly delimited demographically, interest – around a defined topic, and communities of practice – focused on a domain of knowledge (McDonough, 2002).

Electronic communication using information and communication technology (ICT) differs fundamentally from offline communication (Walther, 1996), it can be hyper-personal and offers unique challenges and opportunities. Credibility comprises a cognitive (logical) component and an affective (emotional) component (Evans et al., 2008). The cognitive component involves trustworthiness and expertise along with reliability and competence; the affective component involves empathy. Credibility is positively correlated with message acceptance by recipients. Wellman and Haythornthwaite (2002) maintain it supplements other forms of contacts. The question remains as to whether the social capital developed in virtual communities is strong enough to overcome barriers to knowledge sharing.

3. Communities of practice

A community of practice brings together individuals who are united by common goals and meaning, who act together collectively (Lave and Wenger, 1991; Wenger, 1999). The ability of communities of practice to enable members to create and share knowledge is an important capability (Brown and Duguid, 1998; Cole, 1998). The mutual engagement,

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