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Virtual Communities: New Perspectives on Collaboration

Abstract

Thanks to the development of Web 2.0 platforms the classical idea of a community of practice (VCoP) has been adopted in the area of virtual communities. Recently, virtual communities have sprung from various social media platforms bringing about new opportunities for international collaboration, knowledge sharing and problem solving in virtual communities. This paper aims at assessing the factors behind the effectiveness of virtual communities by applying social science theories and Knowledge Management strategies. In addition, this research provides an overview of the trends in information systems research methodology to study virtual communities. Ultimately, this paper offers an academic review of literature towards the benefits and prospects of virtual communities.

Key words: virtual community of practice, Knowledge Management tool, social networking, social media platform, community of practice

Introduction: Web 2.0 Social Media and Virtual Communities

The concept of social media was developed in 1979 from Usenet – a discussion system for posting public messages. Usenet led to the creation of an open diary system known as weblog; shortened later to just blog. Thanks to high speed Internet, MySpace was introduced in 2003 and Facebook in 2004. With the advent of the latter, the term 'social media' was officially established. Indeed the difference between Web 1.0 platforms of Usenet and Web 2.0-based Facebook or MySpace portals is fundamental. Web 1.0 allowed for the publishing of content online; however, content made available to users was pre-created. Consequently, users could only view the information made available to them. Web 2.0 revolutionized social media as the content is generated through users (Kaplan & Haenlein 2010). Therefore, social media are defined along the lines of Web 2.0, which enables users to continuously modify the content collaboratively and in turn, create new content. Given this characteristic, Web 2.0 took the possibility of collaboration to a new level.

Mattessich and Monsey (1992) define collaboration as 'a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals' (p. 7). On an individual level, Schrage (1995, p. 33) defines collaboration as 'the process of shared creation: two or more individuals with complementary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own'. Web 2.0 presents surpassing advantages for collaboration defined as 'shared creation'. As stated by Watson and Harper (2008, p. 3), Web 2.0 is 'a philosophy supporting the development of online collaborative technologies, and it has changed how the World Wide Web is perceived and used'. Indeed, it closes the geographical distance and furthermore, fosters a collaborative and sharing environment through a virtual platform where the participants are not only users of content but also co-operative developers. These features of Web 2.0 explain the popularity of electronic peer-to-peer communities that bring together people with common interests who virtually share experience, ask questions and emotionally support one another.

According to Bourhis *et al.* (2005, p. 28) the effectiveness of a VCoP is linked to its actual impact from the point of view of meeting the community's initial objectives, the value it provides to the organization as well as the benefits it provides to its members. Given the fact that an online community is defined as 'a persistent, sustained [socio-technical] network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise' (Barab *et al.* 2004, p. 6–7), the ability to share these elements in an online environment is of primary importance in order for the community to be beneficial, thus effective. In our study we focus primarily on VCoP, thus the ability to share knowledge is considered one of the measures of effectiveness of a VCoP. On the other hand, we focus on the human factors behind the effectiveness of VCoPs. Indeed, Lave and Wenger (1991, p. 98) assessed that a community of practice implies 'participation in an activity system about which participants share understandings concerning what they are doing and what it means in their lives and for their communities', hence we believe that participation is another measure of the effectiveness of a VCoP. Participation in VCoP includes knowledge transfer, knowledge creation and problem solving in a collaborative way. In order to assess factors affecting the effectiveness of a VCoP we focus on the overview of Knowledge Management strategies as well as social science theories. This paper is based on a literature review and it provides a theoretical background for conducting empirical assessments of VCoPs. The importance of the study comes from the fact that the field of research of VCoPs is still new and its potential is underexplored. It has been assessed that qualitative research should shed light on the self help processes of VC participants, quantitative research should assess for whom VCs are effective and how this support can be exploited since very few studies have assessed the effectiveness of a CoP. This should be based on robust evidence (Eysenbach *et al.* 2004). Future research should also concentrate on reported organizational challenges e.g. knowledge discovery, collaboration and quick decision making. Our paper provides thus a theoretical basis for future research in the field.

Communities of practice and the opportunities for online collaboration

There are thousands of online communities today. In real life, such networks have existed before the invention of the Internet in workplaces, private networks or bulletin boards. Transposed on the Internet, a virtual community (VC) is an electronic self-support group such as a news group, a discussion forum or a chat room. VCs are Internet-based social bodies where a group of participants passionately discusses for a period of time long enough to develop personal relationship through the Internet. This research focuses primarily on the Virtual Communities of Practice (VCoP), which are VCs especially important from the point of view of opportunities for collaboration.

Wenger (2004) distinguished three fundamental characteristics of Communities of Practice (CoP), namely:

1) the domain – an area of shared inquiry, interest or need, which allows people to learn from each other;
2) the sense of community (also known as social presence), which is based on 'joint activities and discussions, helping each other, and sharing information';
3) the practice, which enables participants to jointly elaborate a 'shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems' enabling them to deepen their expertise and put the knowledge into action.

CoPs take responsibility for fostering their own learning, managing knowledge and developing competencies (van Winkelen 2003). A VCoP is a type of a virtual community, which joins people with the aim of gaining knowledge and expertise through virtual interaction (Robertson 2011). VCoPs involve people jointly developing a shared collection of resources to support work in a specific field such as healthcare, education etc. A VCoP may gather online not only professionals but also other interested parties, for instance, healthcare VCoPs comprise healthcare providers, physicians and patients. Within such a community, HC cases and treatments are discussed, documents are shared and experts are consulted to share experiences (Demiris 2006). According to Casalini *et al.* (2006) two features distinguish the VCoPs activities, namely interactions among members are supported by Information and Communication Technology (ICT) and activities are carried out collaboratively. The importance of virtual collaborative work is increasing not only because of its economical and environmental benefits, but also due to its flexibility for establishing dynamically new cross-organizational and cross-cultural innovative teams (Heimburger *et al.* 2010).

It has been assessed that VCoPs are valuable since they allow for a transfer of knowledge between people, which enables members to learn from one another as well as fostering new knowledge creation. Given the fact that knowledge is the driving force behind VCoPs, Knowledge Management (KM) strategies are vital for their effectiveness. KM is defined as a strategy for sharing knowledge and increasing collaboration to achieve organizational objectives. Knowledge Management manages knowledge through the processes depicted in Figure 1.

Wenger & Snyder (2000) assessed KM through collaboration to be one of the most powerful ways to innovate and develop these new capabilities. Knowledge plays also a major role in problem solving, which occurs during interaction between

experts (Mancilla-Amaya *et al.* 2010). Casalini *et al.* (2006) assessed that 'among all the possible activities carried out by members of VCPs, one which provides a major benefit to its members is the problem-solving process, since it allows members to collaborate and share expertise to find solutions to problems in the domain'. Figure 2 below illustrates the features of online community and collaboration.
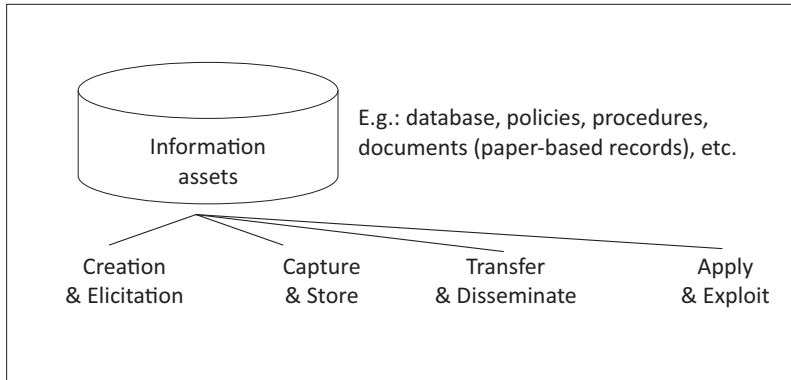

Fig. 1. KM processes

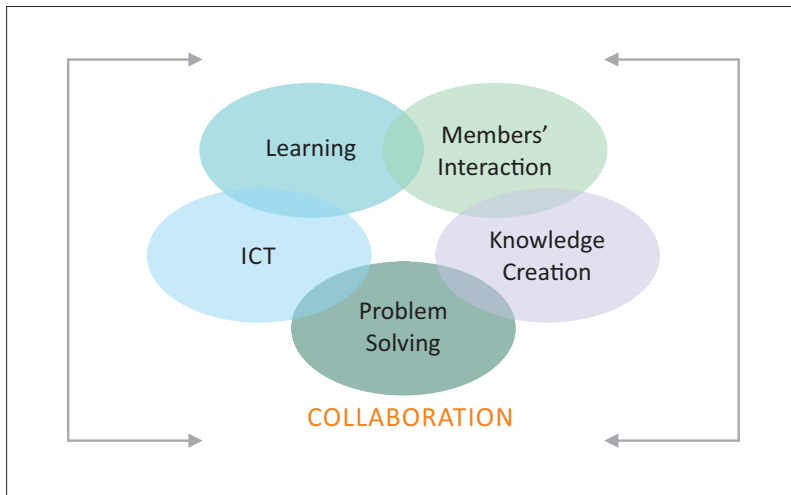Source: Wickramasingha, Gupta & Sharma (ed. 2005, p. 15) and Bose (2002)

Fig. 2. Model of online collaboration

Source: Authors' contribution

Despite various advantages offered by online collaboration, there exists a number of factors that may affect the effectiveness of VCoPs. Hence, it is necessary to provide an in-depth overview of the factors affecting the effectiveness of online collaboration within virtual communities.

Factors in online collaboration: an assessment

The opportunity for transfer of knowledge within a virtual environment and consequently, collaborative knowledge creation relies on the potential created by technology, online relationship building strategies as well as culture.

Technology and knowledge transfer in a virtual environment

To begin with, collaborative environments such as VCoPs require tools to create knowledge and transfer knowledge, hence the need for knowledge management strategies. Knowledge creation, developing new knowledge through constant modification of people's knowledge, and knowledge discovery take place in narratives during personal (as per one's own ability to absorb his/her own experience) and collective (application through interaction between individuals working together) collaboration (Paul 2006). From a Knowledge Management (KM) perspective collaboration exists by communicating and applying both tacit and explicit knowledge. While tacit knowledge is unstructured and is formed as experience in minds, explicit knowledge is structured and allows for easy storage and processing (Bose 2002). Both types of knowledge are needed in the workplace (Smith 2001). Explicit knowledge without tacit knowledge is not useful. Tacit knowledge without explicit knowledge is limited. Explicit knowledge has challenges such as quality and completeness. On the other hand, tacit knowledge is hard to readily access as it is transmitted only through narrative communication, demonstration, apprehension or observation through personal network where experience is shared through collaboration within a social environment (Paul 2006). Consequently, KM requires KM technologies like infrastructure, Internet, intranet and extranet as a pre-requisite for the KM environment (Bali & Dwievedi 2007). Even though ICT introduces cost effectiveness and reduces geographical limitations, transferring tacit knowledge is difficult since intuition or emotions are not readily supported by ICT unlike the explicit knowledge and data (Paul 2006). Knowledge is transferred through two KM strategies: codification and personalization (Antonio & Lemos 2010). Codification refers to storing and distributing explicit knowledge in Information Systems. On the other hand, personalization exists, for instance, in a VCoP where tacit knowledge is shared and transferred between people to discover know-how and best practices (Antonio & Lemos 2010). While technology facilitates explicit knowledge sharing, tacit knowledge is shared through interpersonal means (Chang & Chuang 2011). Consequently, the human factor such as the network of relationships between people in a VCoP is essential. We discuss this in detail in the next section.

On the other hand, VCs are not only facilitated by technology, but need to be concerned with the adaptation issue of such a technology. Technology adaptation is observed in the Technology Acceptance Model theory, whose adaptation factors are: (1) perceived ease of use – perception that using this technology will be effortless and (2) perceived usefulness – users' belief that the technology will bring improvement (Lai 2010). Consequently, when creating an online community 'it is important to ensure that the application chosen has the right span of features for the user requirements; furthermore that the expected users are comfortable with the software, its capabilities and the intended community' (Tonkin 2005).

Online relationships and VCs

The concept of community was born in sociology, anthropology and other social sciences (Lindkvist 2005). A community is a web of mutually engaging relationships, which are based on reciprocal ties supported by trust, dependency communication and accountability (Bentley, Browman & Poole 2010). Knowledge is shared within the community based on relationships with others. Hence membership involves an emotional as well as an intellectual component (van Winkelen & Ramsell 2002). Indeed, effective community knowledge sharing requires social relationship between community members, and hence trust, as a pre-requisite (Muller 2006). The existence of trust is seen to be a key foundation which requires development before effective knowledge sharing can occur. For the purpose of analysis we adopted Social Capital Theory and Cognitive Theory to explain the factors affecting knowledge sharing and collaboration in a virtual environment.

Knowledge sharing is not expected without an incentive to gain something in return. Knowledge is shared when perceived personal benefits outweight perceived valuable knowledge loss (Chang & Chuang 2011). Current research has studied such user behaviors using Social Capital Theory to explain social participation within VCs, to understand why individuals volunteer to share knowledge and participate; how Social Capital and individual motivation can facilitate knowledge sharing as well as how participation and network of relationships between individuals promote motivation and knowledge sharing (Li & Li 2010; Huysman & Wulf 2006; Widén-Wulff & Ginman 2004). Social Capital Theory is used to explain participation within a virtual social network based on three dimensions:
1) structural – the overall pattern of relationships, participants' connections; include relationships with 'strong ties' (those with multiple contacts on a regular basis) and 'weak ties' (individuals whose contact occurs less frequently);
2) relational – the nature of the relations, e.g. trust, obligation, identity;
3) cognitive – common understanding, shared resources, e.g. common language.

Strong community ties foster a knowledge sharing environment where trust, norms of reciprocity and identification with the community are network assets. As stated by Wasko and Faraj (p. 39) Social Capital 'is recognized as exhibiting a duality: at the group level, it reflects the affective nature and quality of relationships, while on the individual, it facilitates an actor's action and reflects their access to network's resources'. Similarly, the Social Cognitive Theory presents two dimensions. It asserts that the behavior of a member in a community is influenced by how the member judges the outcomes of this behavior. The outcomes may relate to his/her person or to the community. On the personal level, participants like engaging in behaviors that are associated with positive outcomes such as enriching knowledge, making friends, helping others, being seen as skilled or knowledgeable by others, etc. On the community level, the expectations may relate to the benefits of a person's behavior to the virtual community. If the expectations of the outcomes drop so does the behavior of the member in a community. These two social science theories facilitate the understanding of why some participants wish to share and other do not wish to share knowledge within a VC (Chiu *et al.* 2006). By combining Social Capital Theory and Cognitive Theory our model represents the factors facilitating knowledge sharing and consequently, collaboration.
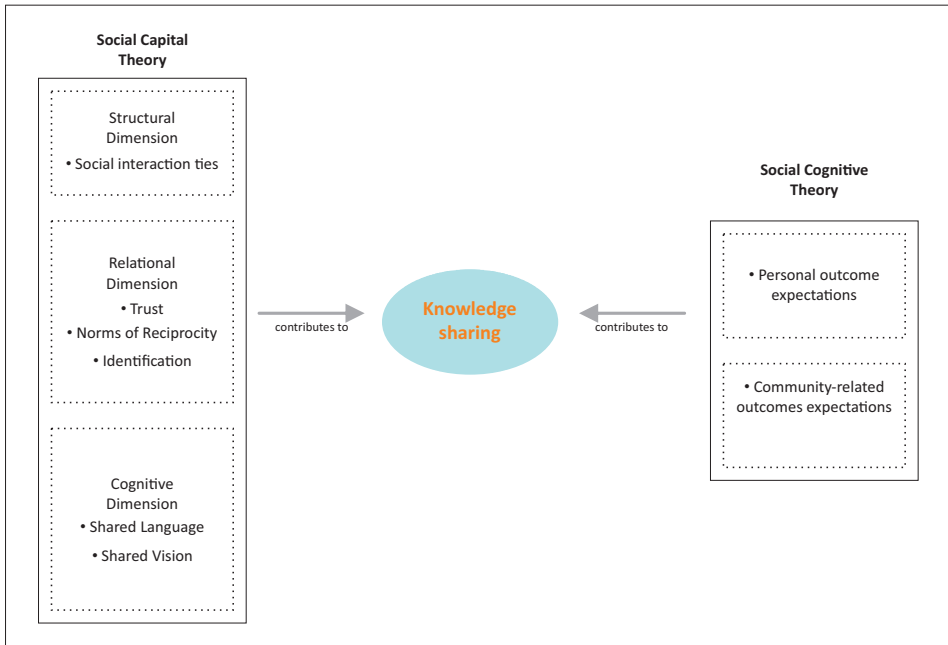
Fig. 3. Factors of knowledge sharing in a Virual Community of Practice

Source: Chiu *et al.* 2006

VCs and culture

Knowledge societies are part of knowledge-dependent operations-based advanced economies transitioned into strategies and policies-based learning. Every society holds a diversity of people's skills and experiences, where knowledge is a commodity that is subsidized. One barrier is that there are no strategies and policies that can assist a society to become knowledge intensive. Knowledge increases as societies globalize. Knowledge assets become goods increasing with time and use unlike tangible goods. A knowledge society is constructed upon four pillars being infrastructure, governance, human capital and culture (Sharma, Samuel & Ng 2009). For the past decade KM, intellectual capital with people management has been a subject of research. People management has concentrated on human behavior, which is a key to the success of KM Strategies. According to De Long (1997, p. 6), in the context of organizations culture refers to values (what an organization's members believe is worth doing or having), norms (shared beliefs about how people in the organization should behave, or what they should do to accomplish their work) and practices (formal or informal routines used in the organization to accomplish work). KM emphasizes organizational culture and teamwork to share knowledge. Hence the leadership style for setting up a mentoring system plays a major role when creating knowledge (Yang 2007).

As stated by Tyler and Swailes (2002), knowledge can be seen as a cultural phenomenon. Indeed, culture plays a major role to encourage knowledge sharing.

An organization should reward sharing of knowledge so this knowledge multiplies within an organization. Organizational culture or organizational core belief is a facilitator of a KM system. It is known as a 'knowledge friendly culture', which means a trust-based collaborative and helpful organizational culture. KM practice is a failure without a supportive organizational culture (Jie 2010). A more knowledgeable workflow is encouraged within an organization by promoting information exchange between employees. Thus, a learning organization responds to organizational knowledge as a solution to the challenge of creating a culture of managed knowledge. Therefore, to foster KM within an organization and across to the outside of an organization, a well-established organizational culture needs to be established. In a learning organization, the behavior or culture of employees is what makes organizational knowledge more effective. This means that workers need to take on interrelated learning processes (Berce, Lanfranco & Vehovar 2008). On the other hand, cultural differences in various parts of the world play varying roles in knowledge sharing. For example, knowledge transfer across cultural boundary poses challenges such as fear to ask the wrong question and hence lose face, as in Asian culture (Ardichvili 2008).

Another supportive pillar is organizational structure (Jie 2010). An organizational structure facilitates knowledge flow. It makes delegating tasks and information collaborators through groups a possibility. Also an effective recovery and monitoring system can be incorporated within such an organizational structure. Effective executions of plans can be negatively affected when knowledge is not transferred appropriately. Hence, organizational structure is a set of relations, e.g. '*vertical differentiation*' or '*authority structure*', i.e. a hierarchal organizational structure. There are various dimensions to an organizational structure. A structural dimension of power is involved when activities are delegated. A coordination dimension exists where knowledge flows within a group of collaborators. The control dimension involves monitoring and recovering activities. Even though there is no appropriate or specific organizational structure, a centralized hierarchy should be transformed into a decentralized and a trust-based structure, where employees can be empowered. This is in order to attain a self-organized and non-hierarchal organizational structure (Jie 2010). Indeed, these considerations must be considered when managing the VCoP's organizational structure as well as membership.

Tab. 1. Selected VCoPs structuring characteristics

Organizational Context	Boundary crossing	Refers to the number of boundaries across work groups, organizational units and even organizations.
	Environment	Forces from the larger context include the characteristics of the environment, the culture and subcultures of the organization(s) involved, the management style(s), and the political context.
	Organizational slack	Refers to the resources available to the organization to allocate to the community in order to absorb the costs associated with the non-productive phases inherent to the learning curve.

| Organizational Context	Degree of institutionalized formalism	Refers to the degree to which a VCoP has been integrated to the formal structure of an organization.
	Leadership	Refers to the governance structure; individuals can be appointed to specific roles or roles can be left to emerge through interaction.
Membership	Size	Refers to the number of members in the VCoP.
	Geographic dispersion	Refers to the physical location of the participants.
	Members' selection process	Refers to the type of membership: an open membership (anyone can become a member) or a closed one (selected members only).
	Members' enrollment	Refers to the way people enroll: on a voluntary or compulsory basis.
	Members' prior community experience	May be created from an existing network of individuals or a new group of people can be assembled for the first time.
	Membership stability	Membership may be relatively permanent, but can also have more fluidity.
	Members' ICT literacy	Refers to the general level of comfort and experience of members with technology.
	Cultural diversity	Refers to the mix of national, professional, and organizational cultures assembled into a VCoP.
	Topic's relevance to members	While day-to-day topics may vary, VCoPs are usually assigned a broad theme or objective that may be more or less relevant to its members' daily work.

Source: Bourhis *et al*. 2005
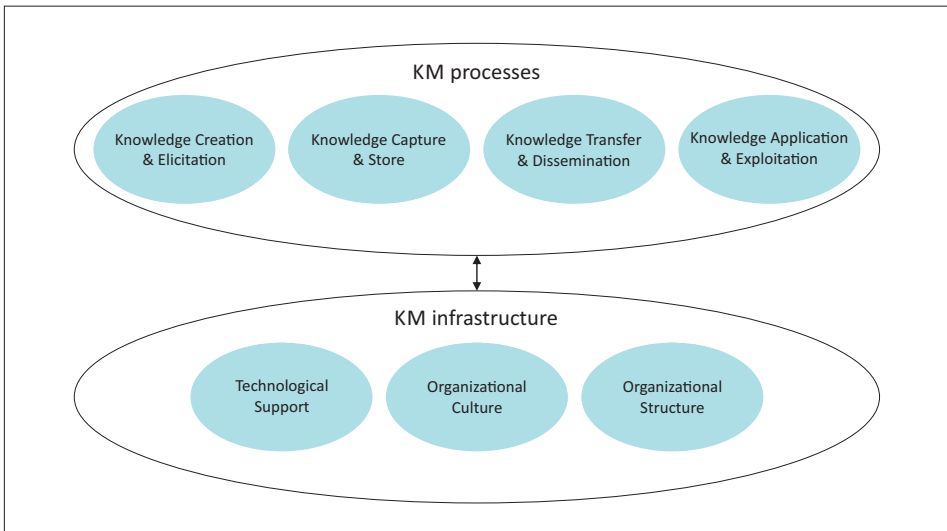
Fig. 4. KM Infrastructure

Source: Authors' contribution

Conclusions

The aim of this paper was to provide a conceptual overview of the factors affecting the effectiveness of VCs and VCoPs in particular. The effectiveness of VCoPs relates to the ability of knowledge sharing and collaboration in an online environment. Technology, relationships between members as well as culture were found to be determining factors for a VCoP's effectiveness. The detailed description of these factors was based on social science theories as well as KM strategies. This paper aims at stimulating empirical research. The following areas are enumerated as possible venues for future study:

1. Improving VCoP knowledge sharing and creation considering that current collaborative environments are information rich but knowledge poor (Bate & Robert 2002);
2. Explaining how tensions between members begin to rise;
3. Assessing how new technology can support knowledge sharing and collaboration thanks to:
   a. Experiment – participants try new ideas,
   b. Review – participants are able to manage their own content better, and
   c. Recombination – a member's idea can be built on another member's idea using technology.

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Społeczności wirtualne: nowe perspektywy współpracy

Streszczenie

Rozwój Web 2.0 pozwolił na przeniesienie koncepcji wspólnoty praktyków na platformę społeczności wirtualnej, co stworzyło z kolei nowe możliwości międzynarodowej współpracy, dzielenia się wiedzą i wspólnego rozwiązywania problemów. Przedstawiony artykuł analizuje czynniki wpływające na skuteczność społeczności wirtualnych powołując się na teorie nauk społecznych i strategie zarządzania wiedzą. Celem artykułu jest ponadto opis nowych nurtów metodologicznych w badaniach z dziedziny informatycznych systemów zarządzania nad społecznościami wirtualnymi oraz przegląd literatury pokazujący zalety i możliwości wykorzystania wirtualnych wspólnot praktyków.