

Virtual Organizing Online Communities in Support of Knowledge Synthesis

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INTRODUCTION

A central issue in the practice of organizational learning concerns the relation between knowledge of individuals and knowledge on the level of an organization (Cohen, 1991; Cook & Yanow, 1993; Weick & Westley, 1996). The cultivation of various communities—formal or informal—throughout an organization, seems to fill an intermediate level of learning between the organization as a whole and individual organizational members (Wenger, McDermott, & Snyder, 2002). There, knowledge links among individuals are established and communal organizational knowledge is collectively contributed and made available to the rest of the organization. In their study of “communities of practice,” Brown and Duguid (1996, p. 60) described learning as a bridge between working and innovation through their activity theory of knowledge, which could be explained by the notion of exploitation and exploration (Cohen & Bacdayan, 1996; Holland, 1975; March, 1991). Exploitation entails the efficient use of existing competencies in terms of decontextualized, codified, and formalized rules of operation. Inevitably, such rules cannot cover the richness and the variability of practical contexts. It is by context-dependent changes from the existing rules (exploration), with the ensuing need for improvisation and experimentation that learning arises, in interaction between members of the community. Oftentimes, exploration is based on storytelling, to capture and share context-bound experience, and to guide experimentation. In the process of learning, exploitation is based on exploration, and vice versa: we exploit what we have explored, and it is on the basis of exploitation that we explore. The extent to which exploitation and exploration can be combined in time and place depends on our ideas of community development, especially for online communities in today’s Internet age, and the deliberation of information technology through the design of suitable information systems (IS) support. To pursue the goal of organizational knowledge synthesis, there is a strong need to leverage the knowledge embedded in the people of the organization. This need of knowledge sharing among potential communities within and beyond the organization has been well exemplified in the notion of a learning organization (LO) (Garvin, 1993; King, 1996; Levine, 2001; Senge, 1990),

which could be considered as an organization, which helps transfer learning from individuals to a group (and vice versa), provide for organizational renewal, keep an open attitude to the outside world, and support a commitment to knowledge. The theme of this article is, then, to examine the knowledge processes required of the learning organization viewed from the online communities’ standpoint, to develop and sustain the communal knowledge base (Davenport & Prusak, 1998; Hackbarth & Groven, 1999; King, 1999; Levine, 2001; O’Leary, 1998) through the elaboration of appropriate IS (or LOIS) (Williamson & Lliopoulos, 2001) support so as to expand an organization’s capacity to adapt to future challenges.

THE BACKGROUND OF ONLINE COMMUNITIES

Not surprisingly, our experiences in physical communities lead us to infer what an online community is. Dictionary definitions, for example, talk of groups with common interests, shared goals, activities, and governance; groups and individuals who cooperate to share resources and satisfy each other’s needs. Literally, the term *online community* is not hard to understand, yet it is slippery to define owing to its multidisciplinary nature. In any case, in order to develop online communities—a complex practical activity—we need a disciplinary definition to guide our practice. According to Jenny Preece (2000, p. 10), an online community consists of four important elements: the people who interact socially as they strive to satisfy their own needs or perform special roles, such as leading or moderating; a shared purpose, such as an interest, need, information exchange, or service that provides a reason for the community; policies, in the form of tacit assumptions, rituals, protocols, rules, and laws that guide people’s interactions; and computer systems, to support and mediate social interaction and facilitate a sense of togetherness. Indeed, this definition is sufficiently general to apply to a range of different communities, including physical communities that have become networked and those that are embedded in Web sites (Lazar & Preece, 1998; Schuler, 1996). Applying this definition to Wenger’s (1998) communities of practice (CoPs), we can interpret a

CoP as a group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise by interacting on an ongoing basis. As they spend time together, they typically share information, insight, and advice. They help one another solve problems; they ponder common issues, explore ideas, and accumulate knowledge. Oftentimes, they become informally bound by the value that they find in learning together. This value is not merely instrumental for their work. It also accrues in the personal satisfaction of knowing colleagues who understand each other's perspectives and of belonging to an interesting group of people. Over time, they develop a unique perspective on their topic as well as a body of common knowledge, practices, and approaches. They also develop personal relationships, a common sense of identity, and established ways of interacting. Indeed, CoPs are not a new idea. They were our first knowledge-based social structures, back when we lived in caves and gathered around the fire to discuss strategies for cornering prey, the shape of arrowheads, or which roots were edible. From the accounts of Brown and Duguid (2001) as well as Wenger and Snyder (2000), CoPs appear to be aimed primarily at exploitation, in shared expertise for a joint enterprise, which may then form the basis for some exploration. Here, shared work practice often constitutes a common identity and frame of reference. Indeed, the development of online communities has captured our focus today because organizations have come to realize that their competitive edge is mostly the intellectual capital of their employees (Stewart, 1997), and they need to be more intentional and systematic about managing knowledge through harnessing their human resources in order to stay ahead of the pack. Undeniably, in today's knowledge-intensive economy, organizations are increasingly expecting their employees to continually improvise, and invent new methods to deal with unexpected difficulties and to solve immediate problems, and share these innovations with other employees through some effective channels. In this regard, the idea of online community—be it exploitative or exploratory—has inspired many an organization to initiate their collective learning based not so much on delineated learning paths, but rather on experience sharing, the identification of best practices, and reciprocal support for tackling day-to-day problems in the workplace. Cultivating online communities in strategic areas is considered as a practical way to manage knowledge in terms of critical knowledge domains; organizations need to identify the people and the specific knowledge needed for their work, and explore how they connect them into suitable communities of knowledge so that together they could steward the necessary knowledge. From this viewpoint, the cultivation of an organization's communal knowledge base is literally the development of various

communities of practice throughout the organization, enabled by modern information technologies.

VIRTUAL ORGANIZING ONLINE COMMUNITIES

The idea of *virtual organizing*, attributed to Venkatraman and Henderson (1998), can be considered as a method of operationalizing a learning organization, dynamically assembling and disassembling nodes on a network of people or groups of people, to meet the demands of a particular business context. This term emerged in response to the concept of *virtual organization*, which appeared in the literature around the late 20th century (Byrne, Brandt, & Port 1993; Cheng, 1996; Davidow & Malone 1992; Goldman, Nagel, & Preiss 1995; Hedberg, Dahlgren, Hansson, & Olve, 1997). There are two main assertions associated with virtual organizing. First, virtual organization should not be considered as a distinct structure such as a network organization in an extreme and far-reaching form (Jagers, Jansen, & Steenbakkens, 1998), but virtuality is a strategic characteristic applicable to every organization. Second, information technology (IT) is a powerful enabler of the critical requirements for effective virtual organizing. In practice, virtual organizing helps emphasize the ongoing process nature of the organization, and it presents a framework of achieving virtuality in terms of three distinct yet interdependent vectors: virtual encounter for organization-wide interactions, virtual sourcing for asset configuration, and virtual expertise for knowledge leverage. The challenge of virtual organizing is to integrate the three hitherto separate vectors into an interoperable IT platform that supports and shapes the new organizational initiative, paying attention to the internal consistency across the three vectors.

Understanding the Three-Vector Framework

The first of the three vectors of virtual organizing deals with the new challenges and opportunities for interacting with the members of an organization. The second focuses on the organization's requirements to be virtually integrated in a network of interdependent (business) partners, so as to manage a dynamic portfolio of relationships to assemble and coordinate the necessary assets for delivering value for the organization. The third is concerned with the opportunities for leveraging diverse sources of expertise within and across organizational boundaries to become drivers of value creation and organizational effectiveness. All these three vectors are accomplished by the provision of suitable IS support, whose

ongoing design represents the LOIS challenge of every organization in the Internet age.

- **Virtual Encounter:** This idea of remotely providing interaction with the organization is not new, but has indeed been redefined since the introduction of the Internet, and particularly, the World Wide Web. Many an organization feels compelled to assess how its products and services can be experienced virtually in the new medium of the Internet. The issue of customization is important. It requires a continuous information exchange with parties of interest, which in turn requires an organizational design that is fundamentally committed to operating in this direction. Practically, organizations need to change from an inside-out perspective to an outside-in perspective. This is often characterized by the emergence of electronic customer communities, the information-gathering and information-disseminating conduits, with a distinctive focus, and the capacity to influence the organization's directions in a wider community. It is believed that as virtual organizing becomes more widespread, organizations must recognize communities as part of the value delivery system and respond appropriately in their strategies.
- **Virtual Sourcing:** This vector focuses on creating and deploying intellectual and intangible assets for the organization in the form of a continuous reconfiguration of critical capabilities assembled through different relationships in the business network. The mission is to set up a resource network, in which the organization is part of a vibrant, dynamic network of complementary capabilities. The strategic leadership challenge is to orchestrate an organization's position in a dynamic, fast-changing resource network where the organization can carefully analyze its relative dependence on other players in the resource coalition and ensure its unique capabilities.
- **Virtual Expertise:** This vector focuses on the possibilities and mechanisms for leveraging expertise at different levels of the organization. In today's organizations, more tasks are being redefined and decomposed so that they can be done at different locations and time periods. However, the real challenge in maximizing work-unit expertise often rests not so much in designing the technological platform to support group work but in designing the organization structure and processes. The message is clear: knowledge lives in the human act of knowing, and though it is often an accumulation of experience that is much more a living process than a static body of information, knowledge should be systematically nurtured and managed. Besides, organizations are

increasingly leveraging the expertise not only from the domain of a local organization but also from the extended network of broader professional community.

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Adapting the Three-Vector Framework to Online Communities

What makes managing knowledge a challenge is that it is not an object that can be stored, owned, and moved around like a piece of equipment or a document. It resides in the skills, understanding, and relationships of its members as well as in the tools, documents, and processes that embody aspects of this knowledge. In response to such knowledge challenge in a learning organization, it is interesting to observe how the ideas of virtual organizing can be applied to nurturing the growth of various online CoPs scattered throughout an organization.

- **Virtual Encountering of the Various Online Communities:** From a management perspective, it is important to identify what CoPs currently exist in the organization, and if they are not already online, how to enable them to be online in order to provide more chances of virtual encounter of such communities, to the organizational members. For those communities already online, it is also important to design opportunities of interaction among different online communities, to activate their knowledge sharing. Since it is not a CoP's practice to reduce knowledge to an object, what counts as knowledge is often produced through a process of communal involvement, which includes all the controversies, debate, and accommodations. This collective character of knowledge construction is best supported online with individuals given suitable IS support to participate and contribute their own ideas. A LOIS subsystem, operated through virtual encounter, could help achieve many of the primary tasks of a community of practice, such as establishing a common baseline of knowledge and standardizing what is well understood so that people in the community can focus their creative energies on the more advanced issues.
- **Virtual Sourcing of the Various Online Communities:** From the discussion built up in the first vector, it is not difficult to visualize the importance of identifying the specific expertise of each potential CoP in the organization, and if not yet available, planning for its acquisition through the various communities. In order to enable an organization to be part of a vibrant, dynamic network of complementary capabilities, in which the same organiza-

tion could claim others' dependence and ensure its unique capabilities, a LOIS subsystem, operated through virtual sourcing, could help the organization understand precisely what knowledge will give it the competitive edge. The organization then needs to acquire this knowledge, keep it on the cutting edge, deploy it, leverage it in operations, and steward it across the organization.

- **Virtual Expertizing of the Various Online Communities:** It is important to understand that not everything we know can be codified as documents and tools. Sharing tacit knowledge requires interaction and informal learning processes such as storytelling, conversation, coaching, and apprenticeship. The tacit aspects of knowledge often consist of embodied expertise—a deep understanding of complex, interdependent elements that enables dynamic responses to context-specific problems. This type of knowledge is very difficult to replicate. In order to leverage such knowledge, a LOIS subsystem, operated through virtual expertise, could help hook people with related expertise into various networks of specialists, to facilitate stewarding such knowledge to the rest of the organization.

CONCEIVING KNOWLEDGE PROCESSES FOR ONLINE COMMUNITIES

In order to facilitate the stewarding of knowledge through the various online communities in an organization, it is important to have a vision that orients the kind of knowledge an organization must acquire, and wins spontaneous commitment by the individuals and groups involved in knowledge creation (Dierkes, Marz, & Teele, 2001; Kim, 1993; Stopford, 2001). This knowledge vision should not only define what kind of knowledge the organization should create in what domains, but also help determine how an organization and its knowledge base will evolve in the long run (Leonard-Barton, 1995; Nonaka & Takeuchi, 1995). The central requirement for organizational knowledge synthesis is to provide the organization with a strategic ability to acquire, create, exploit, and accumulate new knowledge continuously and repeatedly. To meet this requirement, we need an actionable framework, which could facilitate the development of this strategic ability through the various communities. It is believed that there are at least three major processes constituting the synthesis framework of a learning organization, including the personal process, the social process, and the organizational process. What follows is our appreciation of these three important knowledge processes considered as in-

dispensable in the daily operations of the learning organization. Of particular interest here is the idea of appreciative settings, which according to Vickers (1972, p. 98), refer to the body of linked connotations of personal interest, discrimination, and valuation which we bring to the exercise of judgment and which tacitly determine what we shall notice, how we shall discriminate situations from the general confusion of ongoing event, and how we shall regard them.

- **The Personal Process:** Consider us as individuals each conscious of the world outside our physical boundaries. This consciousness means that we can think about the world in different ways, relate these concepts to our experience of the world and so form judgments which can affect our intentions and, ultimately, our actions. This line of thought suggests a basic model for the active human agent in the world. In this model we are able to perceive parts of the world, attribute meanings to what we perceive, make judgments about our perceptions, form intentions to take particular actions, and carry out those actions. These change the perceived world, however slightly, so that the process begins again, becoming a cycle. In fact, this simple model requires some elaborations. First, we always selectively perceive parts of the world, as a result of our interests and previous history. Second, the act of attributing meaning and making judgments implies the existence of standards against which comparisons can be made. Third, the source of standards, for which there is normally no ultimate authority, can only be the previous history of the very process we are describing, and the standards will themselves often change over time as new experience accumulates. This is the process model for the active human agents in the world of individual learning, through their individual appreciative settings. This model has to allow for the visions and actions, which ultimately belong to an autonomous individual, even though there may be great pressure to conform to the perceptions, meaning attributions, and judgments, which belong to the social environment, which in our discussion is the CoP.
- **The Social Process:** Although each human being retains at least the potential selectively to perceive and interpret the world in his/her own unique way, the norm for a social being is that our perceptions of the world, our meaning attributions, and our judgments of it will all be strongly conditioned by our exchanges with others. The most obvious characteristic of group life is the never-ending dialogue, discussion, debate, and discourse in which we all try to affect one another's perceptions, judgments,

intentions, and actions. This means that we can assume that while the personal process model continues to apply to the individual, the social situation will be that much of the process will be carried out intersubjectively in discourse among individuals, the purpose of which is to affect the thinking and actions of at least one other party. As a result of the discourse that ensues, accommodations may be reached which lead to action being taken. Consequently, this model of the social process which leads to purposeful or intentional action, then, is one in which appreciative settings lead to particular features of situations as well as the situations themselves, being noticed and judged in specific ways by standards built up from previous experience. Meanwhile, the standards by which judgments are made may well be changed through time as our personal and social history unfolds. There is no permanent social reality except at the broadest possible level, immune from the events and ideas, which in the normal social process, continually change it.

- **The Organizational Process:** Our personal appreciative settings may well be unique since we all have a unique experience of the world, but oftentimes these settings will overlap with those of people with whom we are closely associated or who have had similar experiences. Tellingly, appreciative settings may be attributed to a group of people, including members of a community, or the larger organization as a whole, even though we must remember that there will hardly be complete congruence between the individual and the group settings. It would also be naïve to assume that all members of an organization share the same settings, those that lead them unambiguously to collaborate together in pursuit of collective goals. The reality is that although the idea of the attributed appreciative settings of an organization as a whole is a usable concept, the content of those settings, whatever attributions are made, will never be completely static. Changes both internal and external to the organization will change individual and group perceptions and judgments, leading to new accommodations related to evolving intentions and purposes. Subsequently, the organizational process will be one in which the data-rich world outside is perceived selectively by individuals and by groups of individuals. The selectivity will be the result of our predispositions to “select, amplify, reject, attenuate or distort” (Land, 1985, p. 212) because of previous experience, and individuals will interact with the world not only as individuals but also through their simultaneous membership of multiple groups, some formally organized, some informal. Perceptions will be exchanged, shared,

challenged, argued over in a discourse, which will consist of the intersubjective creation of selected data and meanings. Those meanings will create information and knowledge which will lead to accommodations being made, intentions being formed and purposeful action undertaken. Both the thinking and the action will change the perceived world, and may change the appreciative settings that filter our perceptions. This organizational process is a cyclic one and it is a process of continuous learning, and should be richer if more people take part in it. And it should fit into the context of the learning organization scenario.

AN ORGANIZATION MODEL FOR ONLINE COMMUNITIES

As an account of the context of IS work for online communities, we now consider a model in which organization meanings are created. Briefly, there are seven elements in this model (Checkland, 1983; Checkland & Holwell, 1998), worthy of our attention. Element 1 consists of people as individuals and as group members in the organization. Element 2 is the data-rich world people perceive selectively through their various taken-as-given assumptions. Element 3 is the organizational discourse in which meaning is created intersubjectively. Element 4 denotes the attributions of meanings which yield the necessary information and knowledge through a very complex social process involving, perhaps, persuasion and coercion. Element 5 represents the assemblies of related meanings, intentions, and accommodations among conflicting interests. Element 6 represents the purposeful action, best thought of and expressed as a managing of relationships. Element 7 covers the formally organized information systems based on various information technologies (IT) which support organization members in conceptualizing their world, finding accommodations, forming intentions, and taking actions (Elements 5 and 6). In fact, this model is conceived not as a descriptive account of the specific organization process, but a defensible device with a structure to make sense of life in real organizations and their provision of IS (Weick, 1995). In a particular situation, the initial focus might, for example, be on action (Element 6). It might be found to be inadequately supported by the IS in Element 7, or it might be found that some boring action previously taken by people could now be automated. In another situation, a new development in IT (element 7) might cause a rethink of possible knowledge (element 4), intentions (Element 5), and action (Element 6). Meanwhile, from an organization architect’s viewpoint, elements 1-5 describe the organizational con-

text in which people create meanings and intentions; this leads to purposeful action being taken (Element 6). Element 7 provides what would usually be described as information support. Thus, we have a process (elements 1-5) and a form of support (Element 7) for a main outcome of that process, namely, the purposeful action (Element 6), which people take as a result of the process. In general, this model should have pathways, which link all elements with one another; namely, there is no clear starting point for use of the model. However, the cycle might be dominated, in particular circumstances, by changes in (or changed perceptions of) any of the elements in the model. Accordingly, this model could serve as an intellectual device to study the operationalization of any online communities in an organization.

FUTURE TRENDS OF IS DESIGN FOR ONLINE COMMUNITIES

Undeniably, setting up an organizational IS for online communities is a social act in itself, requiring some kind of concerted action by many different people (Vat, 2004a); and the operation of an IS entails such human phenomena as attributing meaning to manipulated data and making judgments about what constitutes a relevant category (Vat, 2004c). In this regard, the use of activity models in the creation of IS support can be seen as a process which learns its way to the meanings that characterize an organizational context. This idea of learning the meanings, by which people sharing a human situation seek to make sense of it, is a significant feature of Soft Systems Methodology (SSM) (Checkland, 1981; Checkland & Scholes, 1999). The important point is that we must not lose sight of the fact that purposeful activity models, often called Human Activity Systems (HAS) in SSM, are not would-be descriptions of parts of the world. Instead, they are abstract logical machines for pursuing a purpose, defined in terms of declared worldviews, which can generate insightful debate when set against actual would-be purposeful action in the real world. The implicit belief behind constructing the HAS models is that social reality—what counts as facts about the social world inside an organization—is the ever-changing outcome of a social process in which human beings continually negotiate and renegotiate, and so construct with others their perceptions and interpretations of the world outside themselves, and the dynamic rules for coping with it. Researching social reality in the context of IS development then becomes an organized discovery of how human agents make sense of their perceived worlds, and how those perceptions change over time and differ from one person or group to another (Vat, 2004b). In the process, we do not expect to discover

unchanging social laws to set alongside the laws of natural sciences. Rather, an organization is perceived as entailing readiness on the part of its members to conceptualize it and its internal and external relationships in a particular way, though it is also understood that such readiness changes through time, sometimes incrementally, sometimes in a revolutionary way, as perceptions and membership change. The basic shape of the SSM-based learning approach could simply be described as follows: Find out about the problem situation that has provoked concern; Select relevant concepts that may be integrated into different human activity systems; Create HAS models from the relevant accounts of purposeful activity; Use the models to question the real-world situation in a comparison phase. The debate initiated by the comparison normally entails the findings of accommodations between conflicting interests, that is to say, situations that may not satisfy everyone, but could still be lived with, enabling action to be taken. Oftentimes, the purpose of the debate is to collectively learn a way to possible changes (improvements) to the problem situations, by activating in the people involved, a learning cycle, which counts on their ability to articulate problems, to engage in collaboration, to appreciate multiple perspectives, to evaluate and to actively use their knowledge. It is worthwhile to notice that taking the purposeful action would itself change the situation, so that the whole cycle could begin again, and is in principle never ending. Likewise, through SSM, IS architects could provide help in articulating the requirements of specific IS support through operating the learning cycle from meanings to intentions to purposeful action among the specific group of organizational members.

CONCLUSION

This article describes an initiative to develop an actionable framework of knowledge processes, which are aimed to facilitate the creation and sharing of knowledge among online communities in the context of a learning organization. In particular, our discussion has clarified the idea of the virtual organizing approach to position the appropriate use of information technology in the construction of the LOIS whose design philosophy is based not so much on the mechanical hard system engineering paths but rather on the empirical experience of soft systems methodology. Namely, our LOIS design is based on meaning attribution, founded on the identification of best practices, and reciprocal support for tackling day-to-day problems in the organizational workspace. The creation of such a LOIS support is considered as essential to any organization whose mission is to help transfer learning

from individuals to a group, provide for organizational renewal, keep an open attitude to the outside world, and support a commitment to knowledge. Specifically, we have elaborated the design issues of three important knowledge processes (the individual, the social, and the organizational), which have tremendous implication in the design of suitable IS support (Vat, 2004a) to help structure and facilitate knowledge interconnectivity. Moreover, through the exposition of a process model for organizational meaning, in which, in a specific organizational context, a community of people can conceptualize their world and hence the purposeful action they wish to undertake, we render a perspective of an organizational context in which IS work could be developed; namely, learning organizations could be considered as cultural processes in which social reality is continually defined and redefined in both the talk and action which carries and expresses the multiple agendas of the community members. This provides the basis for ascertaining what IS support is needed by those undertaking that action, and how modern IT can help to provide that support. The article concludes by reiterating the approach of designing LOIS support through SSM-based HAS modeling so that the purposeful actions of different online communities can be accommodated through the elaboration of suitable information technologies.

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KEY TERMS

Appreciative Settings: A body of linked connotations of personal or collective interest, discrimination, and

valuation which we bring to the exercise of judgment and which tacitly determine what we shall notice, how we shall discriminate situations of concern from the general confusion of ongoing event, and how we shall regard them.

Communities of Practice (CoP): These are people who come together around common interests and expertise. They create, share, and apply knowledge within and across the boundaries of teams, business units, and even entire organizations— providing a concrete path toward creating a true knowledge organization.

Information Systems (IS) Support: An IS function supporting people taking purposeful action. This is often done by indicating that the purposeful action can itself be expressed via activity models, through a fundamental rethinking of what is entailed in providing informational support to purposeful action. The idea is that in order to conceptualize, and so create an IS support which serves, it is first necessary to conceptualize that which is served, since the way the latter is thought of will dictate what would be necessary to serve or support it.

Knowledge Processes: These are processes to leverage the collective individual learning of an organization such as a group of people, to produce a higher-level organization-wide intellectual asset. This is supposed to be a continuous process of creating, acquiring, and transferring knowledge accompanied by a possible modification of behavior to reflect new knowledge and insight, and to produce a higher-level intellectual content.

Knowledge Synthesis: The broad process of creating, locating, organizing, transferring, and using the information and expertise within the organization, typically by using advanced information technologies.

Learning Organization: An organization that helps transfer learning from individuals to a group, provide for organizational renewal, keep an open attitude to the outside world, and support a commitment to knowledge.

It is also considered as the organization that focuses on developing and using its information and knowledge capabilities in order to create higher-value information and knowledge, to modify behaviors to reflect new knowledge and insights, and to improve bottom-line results.

Online Communities: Communities comprising four important elements: the people who interact socially as they strive to satisfy their own needs or perform special roles, such as leading or moderating; a shared purpose such as an interest, need, information exchange, or service that provides a reason for the community; policies in the form of tacit assumptions, rituals, protocols, rules, and laws that guide people's interactions; and computer systems to support and mediate social interaction and facilitate a sense of togetherness.

Soft Systems Methodology (SSM): A methodology that aims to bring about improvement in areas of social concern by activating in the people involved in the situation a learning cycle which is ideally never ending. The learning takes place through the iterative process of using systems concepts to reflect upon and debate perceptions of the real world, taking action in the real world, and again reflecting on the happenings using systems concepts. The reflection and debate is structured by a number of systemic models of purposeful activities. These are conceived as holistic ideal types of certain aspects of the problem situation rather than as accounts of it. It is also taken as given that no objective and complete account of a problem situation can be provided.

Virtual Organizing: An electronic transformation process for any organization transitioning from a bricks-and-mortar entity to its clicks-and-mortar counterpart, emphasizing the appropriate use of information technologies in the three vectors of “virtual encountering” the organization, “virtual sourcing” the tangible and intangible assets of the organization, and “virtual expertizing (managing)” the knowledge of the organization.