

5-2013

The structure of Organizational Virtual Social Networks

Debora Bobsin

Universidade Federal de Santa Maria, deborabobsin@gmail.com

Norberto Hoppen

Universidade do Vale do Rio dos Sinos, norbertohoppen@gmail.com

Follow this and additional works at: <http://aisel.aisnet.org/confirm2013>

Recommended Citation

Bobsin, Debora and Hoppen, Norberto, "The structure of Organizational Virtual Social Networks" (2013). *CONF-IRM 2013 Proceedings*. 42.

<http://aisel.aisnet.org/confirm2013/42>

This material is brought to you by the International Conference on Information Resources Management (CONF-IRM) at AIS Electronic Library (AISeL). It has been accepted for inclusion in CONF-IRM 2013 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

The structure of Organizational Virtual Social Networks

Debora Bobsin
Universidade Federal de Santa Maria
deborabobsin@gmail.com

Norberto Hoppen
Universidade do Vale do Rio dos Sinos
norbertohoppen@gmail.com

Abstract

Organizational virtual social networks (OVSN) reshape social structures due to their ability to strengthen social ties, to change power relations and to enable new forms of cooperation. Research in Information and Communication Technologies (ICT) has led to various approaches that analyze the impact of OVSN on organizations in terms of structure and behavior. Our study aims to analyze important features related to the structure of OVSN. It also aims to strengthen a network approach to analyze organizational phenomena such as working groups and connected individuals, as well as the impact of online networks in organizations. This study was based on the lines of approach described by Oinas-Kukkonen et al. (2010) and on the research carried out by Bobsin & Hoppen (2012) to understand the process of structuring OVSN. Our main results are an OVSN structure consisting of actors and roles, interactions, operating elements and articulating goals. We also analyzed some structural elements of networks which may contribute to the development of a network based approach to study organizational phenomena.

Keywords

Networks, organizations, structure.

1. Introduction

The development of social media and collaborative tools enables the emergence of organizational virtual social networks (OVSN). These nets may reconfigure social structures strengthening social ties and allowing new forms of cooperation (Agarwal, Gupta & Kraut, 2008; Oinas-Kukkonen, Lyytinen & Yoo, 2010).

Research on social networks in Information Communication Technology (ICT) resulted in several approaches that discuss their structural and behavioral impact on organizations (Oinas-Kukkonen *et al.*, 2010). Thus the social networks represent an interesting theoretical element to study the dynamics related to organizational structures and to the behavior of individuals and groups in organizations.

Furthermore, the OVSN can be viewed as alternative or complementary structures to the formally constituted structure. They may enable new relational structures that approximate social actors and alter the notion of hierarchy. Analyzed from this perspective, the constitution of OVSN allows organizational innovation because it

approximates the actors and creates an environment for discussion and interaction between the organization and its processes. These networks also promote the sharing of work, ideas, projects, information and opinions (Kempe, Kleinberg & Tardos, 2003; Bobsin & Hoppen, 2012).

Networks join people with common interests and their success is linked to the group identity that is established among their participants (Ren *et al.*, 2012). This identity is reinforced as people participate in the actions of the network and share their interests, providing a sense of community among the actors. Therefore, the OVSN depend on voluntary collective actions supported by online interactions forming a social structure (Ridings & Wasko, 2010).

In light of this, the aim of our study is to analyze important features related to the structure of OVSN. We also study a network approach to analyze organizational phenomena such as working groups and connected individuals, as well as the impact of networks in organizations. We postulate, as Ren *et al.* (2012), that OVSN offer new channels for organizations to connect their employees, customers and partners, and therefore are a source of innovation and support to business.

This case study adopted the Theory of Structuration (TS) developed by Giddens (1984) as a conceptual foundation and as a methodological tool in order to understand networks as structures being formed by interactions in a recurrent process.

In order to achieve the proposed objectives, we first present the guiding conceptual elements of our research, followed by the research method. Then, we describe and discuss the structure of OVSN and the important elements of the network approach to analyze organizational phenomena. Finally, we discuss the theoretical and practical contributions of our work.

2. OVSN and its structuring elements

OVSN involve a group of people who openly communicate and interact with each other in a space mediated by technology, in order to seek some common goals guided by a set of policies and rules (Phang, Kankanhalli & Sabherwal, 2009). These networks form spaces for collaboration and interaction between members of an organization, and they foster an environment of freedom and volunteering. They tend to be open to the participation of people based on affinities (Aguiar, 2006; Franco, 2011).

Despite the significant growth of networks, few can survive in the long term. This may result from the technical and social elements which constitute the OVSN (Phang *et al.*, 2009): Tasks, actors, work context and technology are highlighted as the key elements of Virtual Social Networks (VSN). However, other components may also integrate the network structure (Mathiassen & Soresen, 2008).

OVSN are characterized by horizontal interactions, by the democratization of decision making and thematic agglutinations, and by the use of ICT as a tool for interaction (Aguiar, 2006). OVSN also promote the independence of their participants who are self-motivated and join the network spontaneously (Ren *et al.*, 2012). Based on organizational networks, actors often perform tasks choosing their partners and working on projects that help them fulfill their personal and organizational objectives. The

purpose that unites the actors and the benefits provided by the network are essential to sustain it as a space for interaction (Ridings & Wasko, 2010).

OVSN use technology as a tool for effective interaction and communication. Networks are not necessarily characterized the technology employed. Users may adopt different tools to collaborate and communicate, such as email, social software, intranet, among others (Mathiassen & Sorensen, 2008).

Organizational networks are often adopted for actions performed by a group of people, and are based on concrete work objectives, which are defined, co-defined or accepted by its participants (DiMicco *et al.*, 2008). An OVSN cannot be restricted; indeed, it should favor the articulation of actors with other networks because the organization is not an isolated unit.

OVSN presuppose a professional relationship among actors who establish horizontal connections in a collaborative environment. These ties can arise spontaneously or formally when based on organizational support. Relationships in networks often lead to roles with defined tasks. These structured roles are based on the activities and goals defined by the group (Marteleto, 2001; Di Micco *et al.*, 2008).

The regularity of the actions and the behavior of the actors result in a series of different roles in the networks (Garton, Haythornthwaite & Wellmaan, 2009; Aguiar, 2006; Niederman, Gregor, Gaver, Lyytinen & Saunders, 2008). We should emphasize the role of the coordinators or facilitators, who enhance interaction and communication. These leaders identify barriers that may hamper the functioning of the network, assisting the group in developing activities and in choosing suitable tools.

In summary, OVSN can be characterized by the participants' common goals, their coexistence with difference (of time, actors, cultures and heterogeneous processes), circulation of information, knowledge production, participation, collaboration, cooperation, horizontal and non-hierarchical relations, socialization of power, and negotiation. Hence, organizational networks may be conceptualized as interactions between actors, mediated or not by ICT, which set up a participatory space, with some planned actions and formalization (through a timetable), adopting specific goals and being influenced by the host organization.

A survey of studies using Giddens' TS in the Information Systems field was performed by Jones & Karsten (2008). They highlighted opportunities to adopt this theory to perform in depth research concerning the use of IT artifacts in organizations. Therefore the OVSN were investigated following fundamental features of the TS (Giddens, 1984): The time and space dimensions, the duality of the structure, and recursion. The time and space dimensions and the duality of the structure supported the identification of the actions and interactions in the networks that form the structures. Recursion allowed us to analyze the formation of the networks and the observation of manners and conditions under which structures were built, exist and were transformed, and to perform our research without a priori definition of their structure.

Networks may be considered as spaces of communication, interaction and integration of its members. They are constituted by physical and social elements. As a consequence,

the OVSN are continuously reconstructed through social actions, and they form new structures as the interactions become stable practices.

3. Research Methodology

Our research strategy was a single case study with the purpose to enable a longitudinal in depth study. This method was chosen because it allows the analysis of the behavior and the actions of groups and individuals in their daily lives (Yin, 2009). Interviews, participant observation and document analysis were used to collect data.

The case was studied in a university organization (UNI) and three OVSN constituted the units of analysis. Three forums of discussion and deliberation formed the organizational networks, which were focused on undergraduate programs in three different areas of knowledge – Engineering and Mathematical Sciences, Teacher Education, and Applied Social Sciences. These forums covered topics of interest to their participants like legal and academic standards, the structure of the undergraduate programs, integration of courses, etc. The number of participants on each forum was in the range of 20 to 30 people. The forums operated based on face-to-face meetings and virtual interactions. The forums evinced the characteristics of an OVSN pointed out by Aguiar (2006), such as horizontal interactions, democratization of decision making and thematic agglutination, as well as the use of ICT.

The OVSN were studied in a five years old university that operates in 10 *campi* located in different cities in the South of Brazil. UNI was selected because its development is based on the use of ICT tools to promote the arrangement of work teams that are spread in different cities. UNI also facilitates the formation of OVSN understanding that they are a space for communication, interaction and integration of its employees. UNI expects that the networks give them an opportunity to exchange experiences, so as to contribute to the formation of an organizational culture.

The three OVSN were chosen from a set of six existing forums because they were in different degrees of consolidation. The integration of one of the authors as an active member in one forum since its creation was another criterion of choice. A third aspect was that both authors took part in the other two forums as participant observers.

The longitudinal case study was carried out for 18 months. Twenty eight interviews with the networks members and with UNI managers were realized. Forty documents were analyzed and ten meetings observed. The research protocol included the organization of the observations made in the units of analysis, a daily field report, the subdivision of the research question on issues that guided the observation, interviews and analysis of documents (e-mails, virtual forums, chats, legislation, projects, meetings reports, etc.), the organization of interviews and the collection of documents. The use of this protocol aims to qualify the research reliability, since both authors were members of UNI.

The TS (Giddens, 1984) was also the basis of the data collection process and oriented the analysis to identify the actions and interactions in the networks that form the structures. This theory enabled us to address how actors conceived the OVSN, to characterize the environment and its boundaries, to define the roles of its members, and to describe their actions and interactions. Through a recursive process, this theory

allowed us to observe the communication processes, the actions undertaken and the results obtained.

The information collected from our sources (observation, interviews and documents) was summarized based on the main themes that emerged from the theoretical approximations between OVSN and the main TS features, the time and space dimensions and the duality of the structure. This procedure allowed us to detect similarities and differences among the networks. The summarization procedure was followed by the analysis of the TS features used to describe the structuration process of the OVSN and to identify their configuration and main elements. The steps of this process were adapted from Crang & Cook (2007).

4. Results

The results obtained support the idea that social actions can change networks. This shows that actors perform repeatedly social practices through which they develop, maintain or change their behavior. The networks are consolidated as social practices become routine and a shared identity is created, serving as an element to aggregate the actors in the group (Ren et al., 2012). OVSN are established from every interaction, building and sustaining organizations and their management.

The social context of OVSN is characterized by the time and space dimensions and the duality of structure. The main elements of OVSN shown in Figure 1 emerged from the analysis of the systematized data and from the comprehension of these dimensions adopting TS.

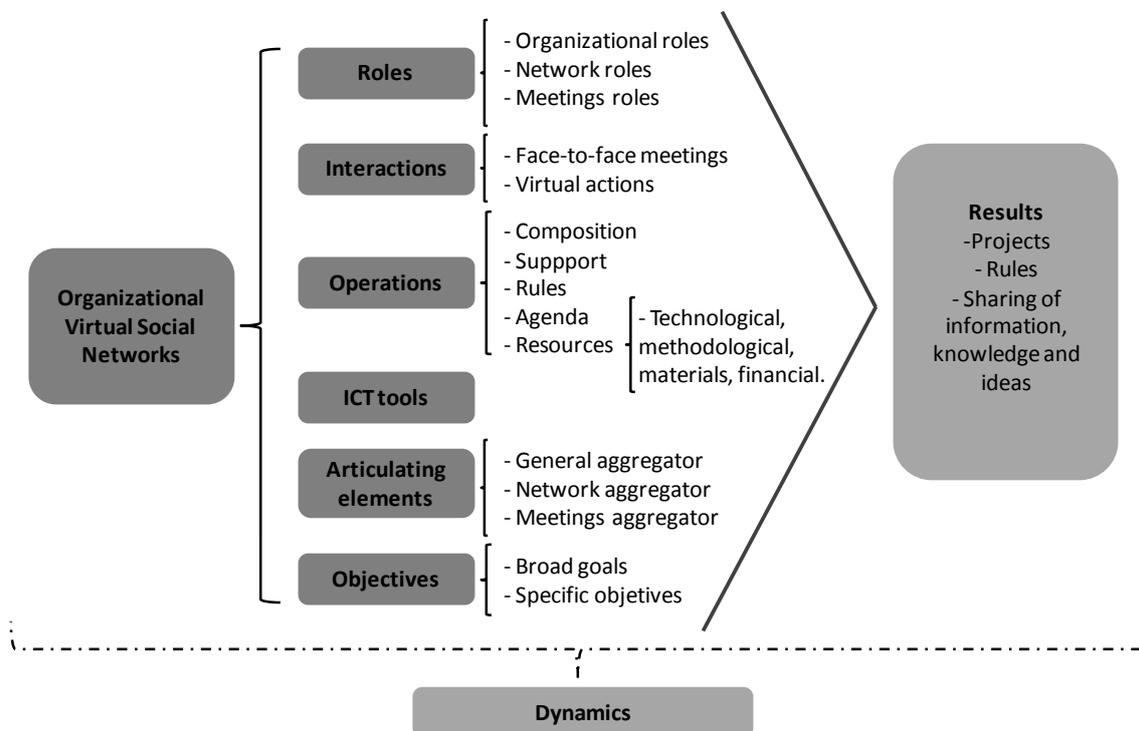


Figure 1: The Structure of an Organizational Virtual Social Networks.

4.1 The OVSN's Structure

The networks' actors play **roles** arising from their professional experience and duties in the organization, and their actions in the network or in the meetings and group interactions. Therefore, we highlight the existence of roles related to the organization, to networks and interactions.

Organizational roles are associated with different functions and positions occupied by actors leading to different activities and responsibilities.

The *network* requires roles such as a coordinator to motivate the group and to mobilize actions. Coordinators helped to organize the face-to-face meetings and the development of activities between each meeting. We found that the more structured networks, which maintain active interactions and present concrete results, are those in which coordinators were more engaged. These coordinators encouraged actions in the networks and obtained the necessary resources to achieve the goals. They did it in a democratic manner without imposing their preferences and decisions to the group. As mediators of the interactions, these coordinators ensured the horizontality of the information flow and maintained the participatory nature of the network. This confirms the findings of Niederman *et al.* (2008).

External members of the networks assumed the role of experts. Their expertise contributed to the discussions regarding a particular subject whose knowledge was not available from the network participants.

Our results also revealed that some participants assumed a linking function connecting the network to the hierarchy of the institution. These participants also connected with members of other networks, and they supported the information flow between different groups. These findings were also evinced by Marteleto (2001).

Several actors mentioned the importance of individual actions of participants. When they returned to their work place after a face-to-face meeting, these actors informed their partners about the discussions and deliberations of the network, preparing the implementation process.

We observed some "floating" participants in the networks. These actors participated on few meetings and did not get involved with the actions performed by the group. In addition we also observed influencers. Under certain conditions and following their points of view they interfere in the action of other network participants. This role was also described by Aguiar (2006). Some of the participants were not identified with any roles in the networks. They justified this as a consequence of the horizontal interactions. Finally we found that during the activities of the network there may be other roles and functions defined collectively, which corroborates Marteleto (2001).

The face-to-face meetings of the network followed the logic of a debate. Certain roles were created according to the organization of the meeting agenda in order to obtain more effectiveness in the network. The same happens in virtual interactions when the group had activities to accomplish. These roles were not formal.

UNI structured a support team to assist all networks. The team's assignment was to help networks to obtain the necessary resources - financial, material and informational - to reach their goals, and it had no power to make decisions for the group.

Interactions encompass both *face-to-face meetings* - structuration of documents and reports; preparation of schedules, socialization of participants and invitations to external members - and *virtual actions* - definition of deadlines, exchange of information and documents. The face-to-face interactions are conducted through meetings following an agenda previously defined by the group. Two to four non virtual meetings per year were organized. The activities carried out through virtual actions at the intervals between meetings were socialized at this moment. These face-to-face meetings were considered very important by all actors. They acquired a strong meaning of integration and socialization to the participants, representing a significant moment for people to meet each other. This phenomenon was also observed by Ren *et al.* (2012).

Communications and interactions in the meetings are characterized by horizontality and non-hierarchy, being subject to controversies and enabling the participation in collective actions. This was also shown by Aguiar (2006).

Virtual interactions adopted different ICT tools chosen by the groups. The tools were selected by the network participants taking in account the activities to be carried out. Thus, we can highlight that there are more structured and instrumental interactions when (1) collaborative tools are used for the construction of texts, and (2) more open communication technologies, such as chats, forums, instant message communicators were adopted to exchange ideas and information. These findings corroborate Mathiassen & Sorensen (2008). The choice of technological tools had a close relationship with the profile of the network participants and with their goals, and influenced the results of their interactions. So, technology, even if not standardized, is an important element of the structure of OVSN, which can facilitate or constrain the formation and consolidation of the networks.

The **operation** of OVSN requires rules, support, schedule and resources. The network *composition* indicates that there are actors with a mandatory participation due to their position in the organization – for example undergraduate program coordinators. All other members of the organization are invited and they participate voluntarily. According to the goals previously set, participants form subgroups responsible for some actions in order to perform the tasks between meetings. This reinforces the importance of a network coordinator. The UNI support team also demonstrated its importance to the operation of the networks as it provided the logistical and, sometimes, the informational *support* to the face-to-face and virtual meetings.

Rules were established by the networks aligned with the goals they set. These rules provided organicity to the networks. They influenced deadlines and the formation of working groups in order to structure the standards to manage the undergraduate programs of UNI that did not exist at the time we started our research.

The only a priori guidelines established by UNI referred to (1) the existence of a network coordinator to organize and moderate the group and the discussions, (2) the mandatory invitation of the program coordinators, and (3) the invitation of external specialists, which contribute to the discussion of specific topics of interest.

Rules were complemented by the *agenda*. It represents a collectively deliberated plan of objectives and activities, as well as the definition of roles and resources to be adopted by the network. The agenda also refers to the organization of meetings, which guide the discussions and the activities in progress.

Resources involve facilities, multimedia projectors and computers, materials, logistics to organize the face-to-face meetings, specific managerial methodologies to perform actions, and project management tools adopted by the OVSN.

ICT tools support the interactions in the network, in particular the exchange of messages, information and documents, and the follow up of actions. We observed different forms to adopt technology in the networks. The use of ICT was related to the profile of the members and the activities accomplished. It was based on the knowledge of the participants and on the adequacy of the ICT functionalities to the tasks. We did not identify ICTs employed permanently. The platform for interaction (Moodle) and the videoconference tools provided by UNI were the only exceptions.

The technological infrastructure transformed the network conditioning the way actors developed their activities. ICT also caused changes in the actions of the network that resulted in changes on their virtual arrangement. Concerning the revelation of hierarchy, we observed that the ICT can serve as a way to operationalize coordination. We also evinced that technology transformed the OVSN according to the manner leading actors develop their activities, as well as that changes on the actions of the network resulted in changes of the use of ICT.

The **articulating element** of OVSNs serves as a bond that unites the actors. All network participants were employees of the same organization, from different hierarchical levels and functions. They constitute the *general aggregator* considering that the organization itself serves as an aggregator and is formed by connections between people. Thus, the actors are members of an organization and are initially articulated by professional ties. The *network aggregator* comprised areas of knowledge and goals (such as the construction of documents, joint research, etc). As some external members participated actively, the boundaries of the network are not limited to the organization. The *meetings aggregator* is composed by an agenda, goals and activities to be developed in face-to-face meetings. The location of meetings also took part of the aggregation process.

Objectives vary from broad to more specific. Among the *broad goals* we highlighted (1) the need for integration of the participants, (2) the knowledge sharing process, (3) the innovation in undergraduate programs concerning contents and pedagogical processes of teaching and learning, (4) the structuration of research groups, and (5) social projects. Among the more *specific objectives* we identified the structuration of rules and normative documents for the undergraduate programs and for UNI as a whole.

Results of the networks' actions can be very different, considering the integration level of the actors, the development of documents and rules as well as the sharing of information, knowledge and ideas. Results are directly related to the objectives and the agenda chosen.

Dynamics of OVSN is related to the technological resources adopted and the temporality of the actions (urgency of results), and is guided by goals. The group profile and the engagement of participants influenced the dynamics. Differences in the

dynamics of the networks highlighted that each group was constructed in a particular way, influenced by the academic formation and by the professional experience of the actors. This phenomenon permeated the structural elements of the OVSN, and was observed by differences in their specific features.

We also observed that each group defined the systematics and procedures considered appropriate to develop its actions. They chose the tools and technologies to manage the network and to accomplish virtual interactions that may reflect on contextual dimensions. This occurred because the structure of the networks delimits the actions of its participants.

The analysis based on TS conditioned our model of OVSN and reinforce a procedural approach of networks. Therefore, the behavior of a network is a consequence from its objectives and articulating elements. Each network determines how to organize and how to develop the activities it wants to achieve. And elements as the purposes of the network, roles, interaction dynamics and resources to be used by its members must be evinced to better understand how the network behaves.

The structure is conceived by TS as a product and a process resulting from actions that enabled and restricted the interactions of the actors of OVSN. Corroborating this idea, Niederman *et al.* (2008) suggested that contextual influences can interfere (and even change) the group agenda and establish particular structures influenced by the activities carried out. Other elements (besides the ones highlighted) may emerge from the interactions in the network since each group defines its work based on the objectives, changing its operation mode and results.

The importance of an institutional support for the networks was also observed. OVSN need and use organizational resources. Thus, OVSN have to be accepted and valued by managers in order to allow the group to develop its activities. This must occur without a direct intervention of the hierarchy. Participants themselves must take ownership of the network and understand it as a place of meaning and collective and participatory work.

4.2 Elements to Constitute a Network Based Approach

The elements of a network structure could also support a network based approach to improve the analysis of organizational phenomena, in special *interactions, operational and articulating elements*. They reinforce the consolidation of working groups and individual's connections and are able to capture the dynamics of organizational phenomena.

The network based approach is an important result for the study of the consolidation of structures and processes within new organizations. It also enables the analysis of the work relations consolidation and of the process of knowledge diffusion. Our research strategy and the results obtained allowed us to empirically subsidize the propositions for social networks studies proposed by Oinas-Kukkonen *et al.* (2010).

5. Conclusions and Implications

This research studied OVSN where connections are established to exchange information and to accomplish joint projects and perform actions that modify organizations. Based on our results some relevant questions may be highlighted.

The networks were in different stages of development, but we did not identify a development cycle of OVSN with well identified lifecycle stages. This corroborates Ransbotham & Kane (2011), who state that groups like these do not undergo linear steps. They experience cycles of creation and maintenance which are not temporally determined.

OVSN may be used to integrate people, information and knowledge and are able to produce innovation. In spite of this, they are not always compromised with practical results. Networks use ICT to aggregate individuals and actions and may also strengthen social ties. In organizations, they serve as an integrating element similarly to the open networking sites. However, in the networks that we studied, actors emphasized the importance of presenting organizational objectives and effective results. The importance given to the objectives and results of a network are related to specific characteristics of the organization. In our case, it was a new organization, which was consolidating its normative and structural elements. In this specific case, networks contribute to participatory management, which is one of the principles of UNI.

Our main theoretical contribution is the construction of an OVSN approach based on the TS, which encompasses a set of elements that constitute the structure of networks in organizations. We identified elements of an OVSN structure that reinforce the approach to study working groups and individuals connected to form social networks, expanding the knowledge about this phenomenon. As networks are designed with dynamism and may change during the interactions, new structures that emerge must be understood. So the approach discussed may be of interest to organizational contexts which offer degrees of freedom to the development of non-hierarchical spaces, or to new organizations that are consolidating structural and regulatory instruments.

Our practical contributions are to understand OVSN as working tools and organizational practices. OVSN also contribute to understand how participants organize and mobilize themselves in a network and analyze the power relationships. Starting from the identified network structure, professionals can analyze the elements used to constitute participatory spaces which support institutional development. These spaces may reveal management challenges, as they integrate principles of democratization and collective participation. Thus, it is important to observe their formation and the conditions necessary to their development and institutionalization. Networks also represent opportunities for an innovative organizational development, setting up more fluid organizational forms, and fostering the comprehension of how actors engage in activities as well as how the actions mediated by technologies are organized.

Finally, we discuss limitations and directions for further research. As both authors were members of the organization studied, data collection and data analysis biases could not be eliminated. To minimize this issue, we adopted different sources of evidence and a rigorous systematic data analysis process.

Furthermore, our research was conducted in a university with several peculiarities. This indicates the need for further research addressing other types of organizations with different hierarchical designs and objectives. It is also important to investigate OVSN with other modes of interaction and which adopt ICT more intensively. Thus, it seems possible to obtain a better understanding of how ICT influence the structure of OVSN. And also, of how a network based approach may contribute to the study of the use of IT in organizations and the resulting organizational phenomena.

References

- Agarwal, R., Gupta, A. K., & Kraut, R. (2008). "The Interplay Between Digital and Social Networks", *Information Systems Research*, (19)3, 243-252.
- Aguiar, S. (2006) *Redes sociais e tecnologias digitais de informação e comunicação*. Retrieved from <<http://www.rits.org.br>>.
- Bobsin, D., & Hoppen, N. (2012). "Estruturação de Redes Sociais Virtuais em Organizações: um estudo de caso", *XXXVI Encontro da ANPAD*, Rio de Janeiro, RJ, Brasil.
- Crang, M., & Cook, I. (2007). *Doing Ethnographies*. [S.l.]: Sage.
- DiMicco, J., et al. (2008, November 8-12). "Motivations for Social Networking at Work", IBM Research, *Proceedings of CSCW'08*, San Diego, California, USA.
- Franco, A. (2011, June). *Por que "redes corporativas" costumam dar errado*. Retrieved from <<http://www.escoladeredes.ning.com>>.
- Garton, L., Haythornthwaite, C.; & Wellman, B. (1999). Studying online social networks. In Jones, S. (Ed.). *Doing internet research*. [S.l.]: Sage.
- Giddens, A. (1984). *The constitution of society*. [S.l.]: California Press.
- Jones, M. R., & Karsten, H. Giddens' Structuration Theory and Information Systems Research. *MIS Quarterly*, 32(1), 127-157.
- Marteletto, R. M. (2001, February) "Confronto simbólico, apropriação do conhecimentos e produção da informação nas redes de movimentos sociais", *DataGramaZero – Revista de Ciência da Informação*, (2)1, fev. 2001. Retrieved from <http://www.dgz.org.br/fev01/Art_02.htm>.
- Mathiassen, L., & Sorensen, C. (2008) "Towards a theory of organizational information services", *Journal of Information Technology*, (23), 313-329.
- Niederman, F., Gregor, S., Gaver, V., Lyytinen, K. & Saunders, C. (2008) "Extending the contextual and organizational elements of Adaptative Structuration Theory in GSS". *Journal of the Association for Information Systems*, (9)10/11, 633-652.
- Oinas-Kukkonen, H., Lyytinen, K., & Yoo, Y. (2010) "Social Networks and Information Systems: Ongoing and Future Research Streams", *Journal of the Association for Information Systems*, (11)2, 61-68.
- Phang, C. W., Kankanhalli, A., & Sabherwal, R. (2009) "Usability and Sociability in Online Communities: A Comparative Study of Knowledge Seeking and Contribution", *Journal of the Association for Information Systems*, (10)10, 721-747.
- Ren, Y., et al. (2012) "Building Member Attachment in Online Communities: Applying Theories of Group Identity and Interpersonal Bonds", *MIS Quarterly*, (36)3, 841-864.
- Ridings, C., & Wasko, M. (2012) "Online discussion group sustainability: Investigating the interplay between structural dynamics and social dynamics over time", *Journal of the Association for Information Systems*, (11)2, 95-120.
- Yin, R. K. (2009) *Case study research: Design and methods*. 4th ed. [S.l.]: Sage.