

PROCESS MANAGEMENT IN COLLABORATIVE NETWORKED ORGANIZATIONS: A PERSPECTIVE UNDER THE SCOPE OF ORGANIZATIONAL MEMORY

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This paper presents an analysis of the relationship between Virtual Organization Inheritance and Organizational Memory. It also frames the concept of process management as being an element of Organizational Memory under the scope of Collaborative Networked Organizations (CNOs). The authors argue that the transformations occurring in processes executed by Virtual Organizations are elements of Organizational Memory and shall be stored for future use by the CNOs' members in order to improve their performance as time passes by.

1. INTRODUCTION

New ways of thinking in organizations are arising and are going to the opposite side of the bureaucracy. Bureaucracy has dominated the organizational studies in the last century, but when concerning the new world scenario nowadays it is not profitable anymore (Drucker, 2006). The organizational reconfiguration that has occurred since the beginning of the 20th, started by Taylor and Ford's ideas, where organizations were hierarchical and bureaucratic, has been changed. New approaches by which organizations work embrace new strategies like collaborative networks, including Virtual Organizations Breeding Environments and Virtual Organizations (Camarinha-Matos and Afsarmanesh, 2006).

Despite the foundations coined in the beginning of the last century have been innovative for that time, they are not, only by themselves, adequate enough to the customers' requirements and expectations nowadays (Friedman, 2005). Actually, such requirements and expectations have increased due to many factors. It is possible to cite some: people's interconnectivity (throughout the Internet), the reduction of customs

barriers, higher participation of women in the society, as well as the rising of the Eastern Asian economies in the commercial scenario just to mention some.

As one alternative to face this new reality and the changes that are day by day faster than the day before, organizations are looking for new approaches, like working in strategic alliances with other organizations or in collaborative networks, as argued in ECOLEAD (2006).

The discipline of Collaborative Networks has risen as the answer to coordinate, manage, and arrange tasks, as well as processes among all agents that are part of the value chain. It means that this approach involves Information and Communication Technologies (ICTs), processes, organizations, individuals, and the learning related to this kind of relationship between organizations and the market.

The rationale behind this paper is that processes are part of the Organizational Memory and processes also foster organizational learning. Such learning may help to provide further reconfigurations in business opportunities that may be shared and used by all actors taking part of the Collaborative Networks. It is seen that processes in Collaborative Networks have not been explored so far as one element of Organizational Memory. Taking this idea into consideration, the paper also investigates the relationship between the assets that may be re-used (inherited) in alliances among organizations (see section 2) and the foundations related to the discipline of Organizational Memory.

In this sense, this research was done as an exploratory and descriptive investigation. Despite processes management and Collaborative Networks (a branch of strategic alliances) be relevant topics in industry and academia (Pereira-Klen *et al.*, 1999; Camarinha-Matos and Afsarmanesh, 2007), both communities do not approach in deep the relationship of organizational memory, inheritance, and processes management altogether, characterizing an exploratory investigation. On the other hand, it is descriptive because it identifies and describes process management in Collaborative Networks under the scope of Organizational Memory.

In order to support this research, studies about strategic alliances, virtual organizations, organizational memory, and processes management were done. It allowed a conceptual analysis and the identification of relevant information to this work.

The content of this paper is divided as follows: section 2 stresses the importance of alliances among organizations, mainly represented by Collaborative Networks; section 3 presents the discussion about Virtual Organization Inheritance and Organizational Memory. The relationship between Organizational Memory with Process Management is shown in section 4; finally section 5 provides the final considerations.

2. ALLIANCES AMONG ORGANIZATIONS

According to Charim (2004), partnership shall be any agreement among organizations, even if it is a relationship of buying-selling. As a result, partnerships are the seeds to a higher interaction among organizations. Gaspareto (2003) argues that the main activities executed in partnerships, under a traditional view, may be represented by *joint ventures*, *holdings*, *consortia*, *outsourcing* and *strategic alliances*.

Regarding the topic of strategic alliances, Child (2003) also argues that the term *Strategic alliance* refers to cooperation between entities in order to improve their objectives. Strategic alliances may range from contract-based joint ventures to less formal collaboration forms (Child 2003), like Collaborative Networks.

The authors of this paper recognize that under the scope of strategic alliance is framed the discipline of collaborative networks. Collaborative Networks that have some kind of organization, like ethical code, rules, and roles, are called as Collaborative Networked

Organizations (CNOs) and comprise a variety of entities. Such entities may be either organizations or individuals (Camarinha-Matos and Afsarmanesh, 2006) and most of them are autonomous, geographically distributed, and heterogeneous. This heterogeneity also considers different environments and the culture of the involved entity (Camarinha-Matos and Afsarmanesh, 2007).

In a slightly different way, when compared to other kinds of networks, the collaboration process under the CNOs' scope is an intention that derives from shared beliefs. Members of a CNO may achieve common objectives that would not be feasible due to high costs and lack of knowledge in specific issues if they would be done by a single organization (Camarinha-Matos and Afsarmanesh, 2006). There are many manifestations of collaborative networks, for a detailed overview about this topic see Camarinha-Matos and Afsarmanesh (2006).

This paper explores only the CNOs' manifestations known as Virtual Organizations Breeding Environment (VBE) and (Dynamic) Virtual Organization (VO). The former stands for a set of organizations that are willing to collaborate with each other and, as such, establishes a long-term cooperation agreement aiming the sustainability of this network (Camarinha-Matos and Afsarmanesh, 2006). The main objective of the VBE is to enable the creation of (dynamic) VOs. The latter (VO) is characterized as temporary alliances among organizations. These alliances are created in order to share skills or core competencies and resources as well as to better respond to collaboration opportunities. Usually VOs are supported by computer networks (Rabelo and Pereira-Klen, 2004).

However, despite VOs increase agility, flexibility, and provide an efficient utilization of resources and knowledge among organizations when facing new business opportunities, they are not continuous. The aspect of temporary arrangements brings some challenges (Karvonen *et al.* 2004), like loss of information, loss of knowledge and other values (Karvonen *et al.* 2007). It composes the assets that can be used to create value in the future, not only to one specific organization, but also to all entities taking part of the VBE and improving its *preparedness* for future collaborations in the forms of VOs.

Hence, these assets must be gathered, stored, properly handled and managed, and retrieved when it is necessary either by other VBE members or by other VOs. Based on that, VO inheritance (VO-I) has emerged as the practice for dealing with issues related to how the information, knowledge, devised practices, products and services may be managed accordingly (Loss *et al.*, 2006). Loss *et al.*, (2006), Karvonen (*et al.* 2007), and Picard (2007) have explored this topic. It is believed that VO-I is closely related to the Organizational Memory (Walsh and Ugson, 1991; Huber, 1991; Nilakanta *et al.*, 2006), however the literature about VO-I have not yet explored this intersection so far. Next section frames the characteristics of VO-I under the scope of the Organizational Memory.

3. VIRTUAL ORGANIZATION INHERITANCE AND ORGANIZATIONAL MEMORY

According to Karvonen *et al.*, (2007) and Loss *et al.*, (2006), VO inheritance is related to the practice of transmitting the experience and other non-proprietary assets that were created in a collaboration process. Karvonen *et al.*, (2007 p. 254) coined the term VO heritage to describe the contents of the VO-I. VO heritage is defined as “the different assets which are inherited from a VO to a VBE”.

The rationale behind the VO-I is that after VOs accomplish their tasks, the lessons learned and the useful outcomes of a certain VO shall return to the VBE, so that the VO-I shall: i) improve preparedness of the VBE; VOs can be created and started faster, and better managed as well; ii) VOs may be more effective and reliable regarding time and

costs, as well as ensure the quality of its products; iii) VO management efforts are reduced and trust relationships reinforced. It is argued therefore that VO-I contributes to the “VBE bag of assets”. The VBE bag of assets is defined as “all valuable elements that different VBE Members may wish to share with others and which are available to all VBE members” (ECOLEAD 2006 p. 16).

Likewise the VBE bag of assets, the Organizational Memory (Walsh and Ungson, 1991; Huber, 1991) seeks for keeping both tangible and intangible assets produced by organizations, working in strategic alliances or not. Walsh and Ungson, (1991) argue that Organizational Memory is structured in five “retention bins”, namely: i) individuals; ii) culture; iii) transformations; iv) structures; and v) ecology. Furthermore, they recognize that Organizational Memory also resides in “external archives”. These external archives are identified as former employees, clients, suppliers, and so forth. Consequently, both organizational memory and VBE bag of assets are constituted not only by human memory, but also by retention elements.

Bringing these research fields together, VO-I and VBE bag of assets could be framed under the conceptualization of Organizational Memory. ECOLEAD (2006) elected different forms of assets that may be inherited by the VBE, the three main types are: i) financial capital; ii) intellectual capital; and iii) social capital. Under the perspective of Organizational Memory these forms of assets are classified as:

Financial Capital corresponds to the retention bin called *Transformations*. Transformations correspond to the “logic that guides the transformation of an input (whether it is a raw material, a new recruit, or an insurance claim) into an output” (Walsh and Ungson, 1991 p. 65). Financial Capital is seen as a *Transformation* because the profit of a certain VO was produced by processes and tasks executed by the VO members. Even being a tangible asset (money or equipments), common procedures or tools used to generate this asset shall be recorded/stored and are part of the organizational memory, but in an inter-organizational context.

Intellectual Capital corresponds to both retentions bins called *Individuals* and *Culture*. According to ECOLEAD (2006), Intellectual Capital is split into:

- *Human Capital* – it is nearby to the retention bin called *Individuals* that retain information and knowledge based on their own experiences and competences (tacit knowledge, skills, and so forth) and their capacity in creating new value; and
- *Structure Capital and Innovation & Learning Capital* – they are related to the retention bin called *Culture*. Culture comprises the way of “thinking and feeling about problems that is transmitted to members in the organization” (Walsh and Ungson, 1991 p. 63). It comprises quality standards, management systems, as well as the understanding of the marked conditions, business and technological solutions.

Social Capital corresponds to the retention bin called *External Archives* because it refers to the relations and logistic channels that an organization maintains with its clients, suppliers or other organizations. Social Capital is also related to the retention bin called *Structure* due to the influence and the perception of the activities executed by certain people and the roles concerning employees, customers and other organizations.

The retention bin called *ecology* is related to the physical structure (setting and design) and it is not covered neither by the VO-I nor by the VBE bag of assets. An illustration about VO-I and Organizational Memory can be visualized in Figure 2.

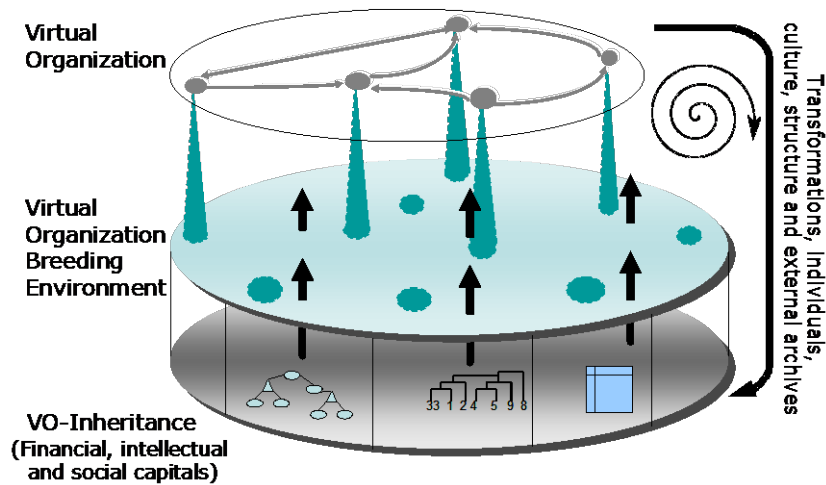


Figure 1. VO-Inheritance. Source: Loss *et al.*, (2006)

As a result of this framing, VO-I can be seen under the scope of Organizational Memory. It also goes beyond the limits of human knowledge (tacit or explicit) as argued by Loss *et al.* (2006). VO-I is not stored in one single spot, indeed it is split over the members and distributed across the organizations.

On the other hand, it is observed that neither VO-I nor Organizational Memory are approaching the management of processes (distributed or not) when dealing with CNOs. Although the research about VO-I and Organizational Memory has been intensified, aspects related to process management are not yet characterized. It is believed that the characterization of process management is an important facet that must be taken into consideration because processes store and provide vital information to the VO's functioning (Pereira-Klen *et al.*, 1999) and thus, they might be seen as one element that is part of the VO-I, and as a consequence, part of the Organizational Memory. Consequently, it is important to study the role of process management under the scope of CNOs as an element of Organizational Memory. Next section gives special attention to this issue.

4. PROCESS MANAGEMENT

In order to formulate and/or change the organizational behavior and become more competitive, organizations shall fulfill certain prerequisites. Some of these prerequisites are closely related to choices in organizational strategies, for example, working in a Collaborative Networked Organization-like, the evaluation about resources availability, as well as working either in a vertical or in a an horizontal (organized by processes) way.

It seems that organizing duties by processes is an interesting alternative in order to provide some level of standard to the inputs and to the outputs in a value chain. Process management, when seen as a organizational methodology, gives the opportunity to enterprises to reach higher efficient rates than the traditional approaches when providing goods and services, adapting themselves to the market changes, leading to efforts integration, and the capacity to learn (Gonçalves, 2000). It implies to represent organizations as a set of processes in order to facilitate the comprehension and increasing business performance, customer relationships, and market share to the stakeholders.

Under the context of CNO, VOs may work based on processes. It means that organizations, being part of a certain VO, are responsible for a set of processes. In this way each organization plays the role of either client (receiving inputs) or supplier (providing outputs) for a certain process, as shown in Figure 3. The whole Collaboration Opportunity will result in a value chain producing and delivering goods or services to the final client.

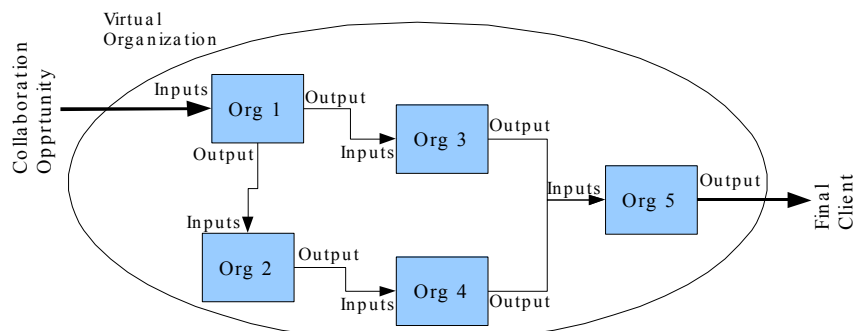


Figure 2. Processes in a Virtual Organization

Hence, processes (represented in Figure 3 by each organization¹) may be understood as “any activity that receives an input, performs transformations in order to add value, and produces an output to an internal or external client” (Harrington, 1993). As such, the creation of concrete results will depend on resources availability and their use by the VO members.

Wearing the lenses of Organizational Memory, processes and the retention bin called *transformation* are alike. Processes have embedded the knowledge and resources to transform an input into an output, similarly as stated by Walsh and Ungson (1991). These transformations are important to be remembered in the future and may be re-used by other VBE members in another collaboration opportunity, so that it shall constitute one more element of the VO Inheritance (Karvonen *et al.*, 2007).

It is argued that all duties in a VO could be executed as processes and thus, it is possible to realize how the duties are executed. As a result, process management break functional barriers and embrace into the VO management model the final client, goods or services, and the workflow executed by the VO itself.

Once duties are split into processes, it is possible to monitor the VO members (owners of the processes) like “black boxes” with their inputs and outputs. The operations on “how the tasks that compose a process are executed” may be inherited by the VBE and be further improved or re-used. At the same time, these “black boxes” deliver products or services according to a specified criteria.

In order to measure “how good” or “how bad” is the inherited content (process), benchmarking tools and performance indicators might be used. Once a process is an agreed and formal procedure in the organization, it is possible to recognize its level of success.

¹ One organization may be responsible for one or more processes.

5. FINAL CONSIDERATIONS

This paper highlighted the relationship between Virtual Organization Inheritance (VO-I) and Organizational Memory and framed the process management as one element of VO-I. It also conceptualized the financial, intellectual, and social capitals pointed as elements of VO-I by ECOLEAD (2006) according to the “retention bins” of Organizational Memory proposed by Walsh and Ungson (1991).

As a result, one may consider the following relationship:

- Financial Capital is related to the retention bin called Transformation;
- Intellectual Capital is related to the retention bins called Individual and Culture; and
- Social Capital is related to the retention bins called Structure and External Archives.

The retention bin called Ecology is related to the physical structure and is not approached under the scope of CNOs, mainly when dealing with Virtual Organizations because VOs do not have a physical venue.

Process management was framed as the retention bin called *transformation* due to the inputs are processed and returned as outputs (goods or services). It means that the processes are the learning instruments used to produce knowledge represented by either tangible or intangible assets. This knowledge may be reused in the future collaboration opportunities.

Next steps include a deeper investigation of this study in order to characterize the retention bin *transformation* in a wider context. It is believed that *transformation* is part of all other retention bins and it aggregates values from all other retention bins.

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6. REFERENCES

1. Camarinha-Matos, L.M., Afsarmanesh, H. "Collaborative networks: Value creation in a knowledge society". In PROLAMAT conference, eds. Wang, K., Kovács, G. L., Wozny, M. J., e Fang, M., vol. 207 of IFIP, Boston: Springer, 2006, pp 26–40.
2. Camarinha-Matos, L.M., Afsarmanesh, H. A Comprehensive Modeling Framework for Collaborative Networked Organizations" *Journal of Intelligent Manufacturing* 2007; 18:529-542.
3. Charim, M. Aliança empresarial no setor de transportes: estratégia para dinamizar o transporte de encomendas em ônibus. Tese de doutorado, Depto de Eng. de Produção – UFSC, 2004.
4. Child, J. Learning Through Strategic Alliances. Eds. Dierkes, M., Antal, A. B., Child, J., e Nonaka, I., *Handbook of Organizational Learning and Knowledge*. Oxford University Press Inc., 2003, pp 657-680.
5. Drucker, P. F. *Classic Drucker – The new society of organizations*. Harvard Business School Press, 2006, pp 127-138.
6. ECOLEAD. European Collaborative Networked Organizations Leadership Initiative. Technical report D21.4a - Characterization of VBE Value Systems and Metrics, March 2006.
7. Friedman, T. L. *The World Is Flat: A Brief History of the Twenty-First Century* Farrar, Straus and Giroux, 2005
8. Gaspareto, V. Proposta de uma Sistemática para Avaliação de Desempenho em Cadeias de Suprimentos. Tese de doutorado, Depto de Eng. de Produção – UFSC, 2003.
9. Gonçalves, José Ernesto Lima. Processo, que processo? *Revista de Administração de Empresas*, São Paulo, v.40, n.4, p. 8-19, out./dez. 2000.
10. Harrington, H. J. *Aperfeiçoando Processos Empresariais*. São Paulo: Makron, 1993.
11. Huber, G. P. Organizational learning: The contributing processes and the literatures. *Organization Science*, 1991, pp 88–115.
12. Karvonen, I., Jansson, K., Salkari, I., Ollus, M., "Challenges in the management of virtual organizations". In Camarinha-Matos, L. (Ed.), *Virtual Enterprises and Collaborative networks* (Kluwer Academic Publishers), 2004, pp 255-264.
13. Karvonen, I., Salkari, I., Ollus, M. "Identification of Forms and Components of VO Inheritance". In IFIP, Vol 243. *Establishing the Foundation of Collaborative Networks*; eds. Camarinha-Matos, L., Afsarmanesh, H., Novais, P., Analide, C. (Springer), 2007, pp 253-262.
14. Loss, L., Pereira-Klen, A. A., Rabelo, R. J. *Virtual Organization Management: An Approach Based on Inheritance Information* In: *Global Conference on Sustainable Product Development and Life Cycle Engineering*. Oct 03-06. São Carlos, SP, Brazil, 2006.
15. Pereira-Klen, A. A., Rabelo, R. J., Spinosa, L. M., Ferreira, A. C. "Distributed Business Process Management". In IFIP International Federation of Information Processing, *Networking Industrial Enterprises*, eds. Camarinha-Matos, L., Afsarmanesh, H., KAP, 1999, pp. 241-258
16. Nilakanta, S., Miller, L. L., Zhu, D. Organizational Memory Management: Technological and Research Issues. *Journal of Database Management*. Jan-Mar 2006; 17, 1 ABI/INFORM Global pg 85.
17. Picard, W. "Continuous Management of Professional Virtual Community Inheritance Based on the Adaptation of Social Protocols". IFIP International Federation of Information Processing, vol. 243. *Establishing the Foundation of Collaborative Networks*; eds. Camarinha-Matos, L., Afsarmanesh, H., Novais, P., Analide, C. (Springer), 2007, pp 381-388.
18. Rabelo, R. J., Pereira-Klen, A. A. "A Brazilian Observatory on Global and Collaborative Networked Organizations". In *Collaborative Networked Organizations: A Research Agenda for Emerging Business Models* (eds) Kluwer Academic Publishers, Norwell, MA, 2004, pp 103-112.
19. Walsh, J. P., Ungson, G. R. Organizational memory. *Academy of Management Review* 1991; 16(1).