# CONFLICT RESOLUTION IN COLLABORATIVE NETWORK ENTERPRISES

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Abstract: Enterprises are nowadays faced with increasing levels of flexibility and customer-orientation. As enterprises react to this challenge, they intensify their engagement in collaborative networks. Recent studies have shown that these networks must share goals, have some level of mutual trust, and agree with some practices and values. Value systems are considered as the ordering and prioritization of the ethical and ideological values held by collaborative networks. Conciliating different values and priorities may depend on a mediation process. From an information systems point of view, the mediation process is highly complex because of the informal and tacit nature of values systems. In this paper we propose using storytelling, an old technique used to reconstruct past events, to support conflict resolution. The paper presents an analysis of conflict resolution in collaborative network enterprises supported by the storytelling technique.

## 1 INTRODUCTION

The current economic situation is characterized by the requirement for a flexible and customer oriented production of goods (Gunasekaran, 2004) (Wiendalh, 2002). In order to bear those challenges, many enterprises intensify their engagement in collaborative network enterprises. Recent studies have shown that some requirements are necessary to create such collaborative network enterprises: share goals between members, have some level of mutual trust and common infrastructures, and agree totally or partially with some practices and values (Camarinha-Matos and H. 2003) (Afsarmanesh, 2005).

Social sciences consider Value Systems as the ordering and prioritization of the ethical and ideological values held by an individual or society. Values can be classified as communal or individual. Communal Value Systems are applied to a community or society and may be supported by a legal set of laws and norms.

There are several studies on Value System in diverse scientific areas, such as Education (Cooley 1977), Organizational Management (Krishnan, 2005) and Information Systems Design (Shneiderman, 1998). Research in collaborative network organizations has addressed Value Systems in diverse ways (Katzy, 1998) (Liu, 2005) (Tan et al. 2004) (M.Jamieson et al. 1986) (Camarinha-Matos and Abreu 2005) (Afsarmanesh, 2005) (Rezgui et al. 2004). However, none of these studies addressed Value System analysis in the conflict resolution context.

Storytelling is a very old technique, possibly linked to the origins of language, to share values within communities. Simplicity, flexibility, informality are characteristics necessary to encapsulate knowledge, and telling a story is a natural form to convey it. That is why storytelling in organizations has been identified as a fundamental means to share norms and values, among other things (Lelic, 2001). Stories powerfully convey norms and values across generations in the organizations. Such norms and values derive from the organization's past but also can shape its future. Stories highlight future opportunities with important decision-making information about the past successes and failures. Organizational members tend

to see stories as a means to understand and commit to the organizational goals, norms and values (Brown, 1982). More recently, the storytelling technique has also been used to reconstructed past knowledge about important events (Perret et al. 2004).

The main goal of this paper is to analyze how conflict resolution in collaborative network enterprises may be supported by the storytelling technique. The next section will introduce the concept of Value System in the collaborative context and summarize different contributions from studies on Values Systems. In the third section, the mediation/conflict resolution process is explained. The Storytelling technique is described in section four. The section five proposes a logical model for implementing the proposed approach in a network enterprise. Conclusions and future work are presented in the last section.

## 2 VALUE SYSTEMS

### 2.1 Overview

In psychology and sociology, values have typically been conceptualized as shared beliefs about desired behaviors and end-states (Rokeach, 1973). These shared beliefs address goal pursuit processes and outcomes. Merton (1957) advocates that the cultural objectives of an organizational unit are the "Things worth striving for" - what has outcome value in the culture. Value has also been defined as "relative worth, utility, or importance: degree of excellence." (Webster, 1989) This definition highlights the fact that object's value depends on the "standard" that is used in evaluation. Depending on the standard, the same object may be valuated differently. Inside an organization, cultural and social values are used as referential for evaluations. The set of values accepted by an individual or society define their value systems.

This concept has been studied and applied by diverse researchers. The philosopher Robert Hartman developed Formal Axiology, which is a branch of Axiology (a general theory about human values, their origins, interrelationships and dynamics) attempting to apply mathematical formalisms to specify values and value systems. Hartman (1973) defined value in terms of a logic-based axiom. The axiom is that value can be objectively determined according to a one-to-one correspondence between the properties of a given object and the specifications contained in its conceptualization. An object has value to the extent it fulfils its conceptualization (Mefford and Meffortd 1997). Hartman also introduced the concept of dimension of value and developed the basic axioms through this concept. He defines three dimensions: systematic value, extrinsic value and intrinsic value. Hartman defends that the foundational concepts of Axiology provide a framework for understanding an object's value and its valuations, based on the three dimensions mentioned above.

Goguen and Linde (1994; 1997; 2004) developed since 1978 several studies about values and value systems in organizations. They proposed a method, using discourse analysis, to elicit the organizations' value systems from a collection of stories told by the members of the organization on informal occasions. The evaluative material collected from these stories is classified and represented using a formal structure designated value system tree (Goguen, 1994). A value system tree serves as a formal summary of the interpretations made the analysts from the collected data.

Other contributions to the study of values systems came from the Distributed Artificial Intelligence discipline. This discipline has developed several theories about value systems using agents. For instance, (Filipe, 2003) proposed an approach based on organizational agents, where each agent is responsible for representing its own values and value system based on preferences with respect to norms.

### 2.2 Value Systems in the Collaborative Network Enterprise Context

A collaborative network enterprise is defined as a temporary alliance of enterprises which come together, sharing skills, core competencies and resources in order to better respond to business opportunities (Camarinha-Matos and H. 2003).

In the network, each organization has its own organizational culture and beliefs, which are mapped in its value system.

As mentioned before, values have typically been conceptualized as shared beliefs about processes and outcomes. So, the choices and processes in an organization are directly influenced by its value system. Working in a collaborative network environment involves sharing decision-making. As decision-making depends on the referential used to evaluate alternative procedures, the decision-making process is strongly influenced by the value system of each network member.

The value system and the value system model are distinct objects. The conceptual model of a value system is a theoretical construct that represents the perceived reality, with a set of variables and a set of logical and quantitative relationships between them.

The construction of the value system model for each organization supports several activities during the collaborative network enterprise life-cycle, such as: partner selection, at the creation phase; adoption of norms, during the configuration phase; conflict resolution and relationship management, during the operation phase; and norms adjustment and new member selection, during the reconfiguration phase.

## 3 MEDIATION AND CONFLICT RESOLUTION

Conflict is usually defined as the "state of opposition, disagreement or incompatibility between two or more people or groups of people". In a positive approach, conflicts are regarded a way of learning and developing social and communication abilities. This approach is supported by the belief that different points of view challenge the human comprehension and perception of new ideas.

Analyzing collaborative network enterprises, according to the values systems context, conflicts appear as the clash of different value elements: objects, activities and choices. The level of conflict depends on the order and prioritization given by an organization to those value elements. In (Weber, 1967), the author defends that the value given to an object, activity and choice depends on the cultural and socialization aspects of the society. Culture involves a community of individuals who collaborate with the purpose to construct a shared reality of the world around them. This constructed shared reality is unique to humans. What is special about cultural values is not their abstract nature, such as freedom or equality as values, but the fact that people recognize those values as being shared with others. In the organizational context, values support the organizational culture and are the starting point of a conflict.

As said above, when two distinct organizations prioritize values in a different way, it is natural that conflicts occur. Resolving a conflict in a collaborative network enterprise, requires a conflict resolution process, which must be carefully chosen to support and maintain the organizations' relationship (CCE, 2002). It is very important that the conflict resolution process satisfies the organizations' interests, naturally associated to their value systems.

Value system conflicts are a specific kind of conflict that may challenge the organizational culture, the collaborative network enterprise and the future relationships within the network. The conflict resolution process must provide a way of sharing and understanding the differences, so that the final result meets both parties' interests to an acceptable degree (Goodim, 1999). Mediation is a well known conflict resolution process in the legal field, used as an alternative to the traditional litigation process, and fits the requirements mentioned before (Advogados, 2004). This process has an informal nature in which a trained mediator assists the parties reaching a negotiated resolution. The mediator does not decide who is right or wrong and has no authority to impose a settlement. Instead, the mediator helps the parties jointly exploring and reconciling their differences (Relvas et al. 2004).

Managing the knowledge about each enterprise value system and the information flows is the key for success in this process.

## 4 STORYTELLING

Stories are a universal means of communication, allowing the representation and organization of complex knowledge (Laurel, 1993). A human being uses stories because in a deep mind level s/he knows that stories are an excellent, fast and simple mechanism form knowledge dissemination. Storytelling is a method based on the act of telling a story (Lelic, 2001), aiming at capturing and disseminating knowledge.
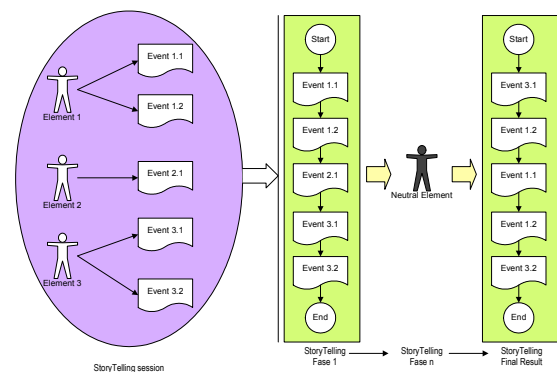


Figure 1: The StoryTelling Method.

Organizations are nowadays aware of the importance of organizational knowledge, and realize that such knowledge is mostly informal and can not be put into categorical or analytical forms, specialy when groups of people and cedision-making processes are involved. In order to solve this problem, organizations develop multiple mechanisms for managing tacit and informal knowledge. Stories provide one possible solution to this problem (Perret et al. 2004).

In storytelling, a story is assembled by events, and events are elicited from different people in

storytelling sessions. These sessions consist of communication and argumentation processes, in which every person contributes, in an informal way, with his or her own view. A preliminary story may constructed after capturing all the events and giving them an order, following the perceived relations between the available events (phase 1). With the contribution of a neutral element, events may then be analyzed in detail and re-arranged, to produce a more elaborate story, where gaps may have been removed and the causal relationships are more thouroughly specified (phase 2). Figure 1 illustrates the storytelling process conducted by a group of people.

As the result of several research studies, storytelling in organizations is considered a mean to share norms and values, develop trust and commitment, and share tacit knowledge. To develop trust and commitment, stories transmit the diversity of competencies and commitments of oneself and others. Revealing personal stories may expose one's competence and commitment to values, as well as signal trust and willingness to collaborate. Relativelly to sharing tacit knowledge, stories are also an efficient mean to exchange entrenched knowledge and transform tacit knowledge into explicit knowledge (Denning, 2002).

Values and norms are defined and maintained as the result of individual's commitment to stories, and thus the organization depends on them to preserve the values system.

## 5 SOLVING CONFLICTS THROUGH STORYTELLING

As mentioned in session 2, different values systems might produce conflicts in the inter-organizational context. The outcomes of the mediation process provide the required understanding of the differences and satisfy the organizational interests in solving the conflict. And the storytelling technique may support this mediation process. Storytelling provides a simple and informal mechanism to organize and inter-connect the information generated in a mediation process. During the mediation process, several arguments are exposed, and these arguments need clarified and structured. This process will allow a better comprehension for those involved.

We propose a conflict resolution model, based on storytelling, structuring the different elements of the enterprises' value systems, as shown in figure 2. The major model components are Values system model that supplies information about each organization's values system and Storytelling component that

captures structures and displays events and their causal relationships.
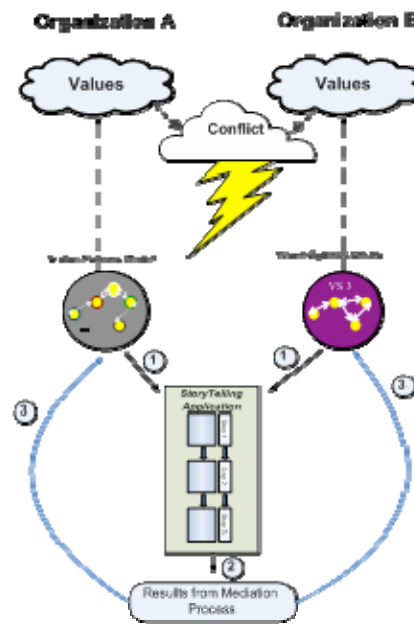


Figure 2: Conflict resolution model.

The storytelling component integrates the stories produced by the organizational elements involved in the conflict with the information stored in the value system model component. It is not enough to build a story based on the arguments produced during the mediation session. Opposite elements will better comprehend the other side if the arguments produced be associated, integrated with the organizational values.

In the process of capturing events, the storytelling component in addition stores the experience of the participants with the conflict resolution process.

Studies in Social Psychology sustain that values come from experiences (Higgins, 1996), and these experiences, as outcomes of the conflict resolution process, should also be added to the values system model component. This knowledge may be used to solve future conflicts, and contributes to the network sustainability.

# 6 CONCLUSIONS AND FUTURE WORK

Norms and values are very important assets in organizations. Collaborative network sustainability depends on conflict resolution processes and the means used to achieve it. We present a possible approach to conflict resolution and network sustainability based on the values system theory and the storytelling technique. The proposed solution utilizes the storytelling technique, to identify and organize events which, when combined with models of the different values system of the participants involved in the process, facilitate conflict resolution. The implementation of the value system model and storytelling components is now in progress.

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