Methods and Tools for Value System Analysis in Collaborative Networked Organisations

Patricia Macedo
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Empresas Virtuais

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• Base concepts.
• Value System Model
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Why is relevant to study Value Systems in collaborative networks environment?

Some requirements are needed to create collaborative coalitions: **sharing goals between members**, having some level of mutual trust, having created some common infrastructures and **having agreed totally or partially on some practices and values** (Afsarmanesh, 2005).

It is important have methods and tools to:

- determine the level of agreement on values
- support the development of a common understand about the shared values among partners.

1. Alignment between VBE core-values and potential partner core-values.
2. Potential for conflicts among VO members.
3. Alignment between VO’s core-values and VO members’ core-values.
Why is relevant to study Value Systems in collaborative networks environment?

Theories about value and evaluation methods across several scientific areas have been developed. Collaborative Networks is a multi-disciplinary research area, where the methods and theories developed in the reference disciplines has to be “reconfigured” and integrated in order to support the characteristics and requirements of collaborative networks.

It is important to develop:
- methods and tools that support in an integrated way the notions of value and evaluation developed in the base disciplines.
- conceptual models that support also the notion of shared values and collaborative capital.

Which are the main components of a value system for a collaborative environment?

How to compare Value Systems of different partners?

Which different types of models and modeling approaches are required to make an analysis of a Value Systems in VBE’s and VO’s, ?

How to characterize partners according to their core-values and preferences?
What do we need to represent and to characterize?

- Core-Values
- Influence among values
- Shared values
- Evaluation
- Preferences
- Value profile
- Value capitals

Which layers the model has to comprise?

- Network Layer
- Member layer

Q2 - Which different types of models and modeling approaches are required to make an analysis of Value Systems in VBE’s and VO’s?

- Support different levels of detail and precision.
- Allow to represent different kinds of elements.
- Represent value influences relationship.
- Allow to represent structural relations between elements.

We need Models to:

- Compare evaluation systems among partners.
- Specify qualitative and quantitative evaluations.
- Define values-profiles of network members.
- Analyze different perspectives of evaluation.
- Analyze the alignment between core-values among network members.
Q1 - Which are the main components of a Value System conceptual model for collaborative network environment?

Represent the prioritization of core-values of an organisation

Indicators

Value Influence level

Index of collaborative profile

Calculate and Reason

Qualitative reasoning Methods

Q4 - How to compare Value Systems of different partners?

We can compare the whole Value Systems or sub-components of the Value Systems.

In order to compare we should to define a way to measure the degree of similarity between two Value Systems and the degree of alignment.
An approach

Software Application to web environment.

Core-value system Analysis

Core value system Alignment Indicators Calculation

CNO's Value System Conceptual Model

Framework to analyze Core-Values in CNO's

Intra Analysis

Inter Analysis

Structural Similarity

Inter relationship Impact

Compatibility Level

Conceptual Model

SYS=<EL,RE>

• EL is set of elements and
• RE is the set of relationships among the elements of EL.

Which elements belong to a Value System?

Value Objects Subsystem (OS)

Evaluation Subsystem (ES)

Value System (VS)

VS =< EVS, RVS > where:

• EVS =< OS, ES > is the aggregation of the two subsystems that compose the value system.
• RVS represents the set of relationships between the two sub-systems.
Core Value System Conceptual Model

This conceptual model is a restricted view of the generic value system model and can be considered as specialization of it.

The prioritization of core-values is defined through core-evaluation perspective.

This model assumes that core-values are the core characteristics of the organisation (or network of organisations) to be evaluated.

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Framework to Core-Value System Analysis

The Core-values analysis in a collaborative context requires a framework that supports the analysis of the relationships among the following entities: core-values, organizations, and VOs. These relationships can be modelled using graphs and causal maps (an extension of graph theory).

<table>
<thead>
<tr>
<th>Core-values influence map.</th>
<th>Organizations’ core-values map</th>
<th>CNO’s core-values map</th>
<th>Elementary-maps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use causal maps to show how core-values influence positively or negatively each other.</td>
<td>Use graphs to show the core-values held by each organisation.</td>
<td>Use graphs to show the core-values held by the CNO, and the core-values shared by CNOs.</td>
<td>Core-Values</td>
</tr>
</tbody>
</table>
Framework to Core-Value System Analysis (cont)

<table>
<thead>
<tr>
<th>Core-Values</th>
<th>Organization</th>
<th>CNO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Use the aggregation of Core-Values influence maps and Organization’s core-values maps, in order to show how core-values of one organisation can influence the core-values of another organisation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use the aggregation of Core-Values influence maps, plus Organization’s core-values maps and CNO’s core-values map, in order to show the impact of member’s core-values in the CNO’s core value system.</td>
<td></td>
</tr>
</tbody>
</table>

Partial Aggregated-maps

Complete

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Core-Value Systems Analysis Method for CNO

Reference Core-Values Ontology C1

CNO’s core-values selection A1.1

Core-values influence map

Organisation’s core-values map for CNO members O1.2

CNO’s members core-values influence map O1.3

Core-values alignment analysis among CNO and its members A1.2

Potential for conflict among CNO members analysis A1.3

Indicators of core-values alignment among CNO and each potential member:
- Number of core-values that have positive influence.
- Number of core-values that have negative influence.
- Number of shared values.

List of pairs of CNO’s members where there is a potential for conflict.

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Example and Exercise

Potential Application Part I - VBE
VBE-Core-values influence map.

Initial - Core Value Map
Potential Application

Part II – A new partner to VBE

1. Alignment between VBE core-values and potential partner core-values.
2. Impact of potential partner core-values in VBE core-values

Core-values influence map
before/after RDC joined the VBE

After
Potential Application
Part III – VO Creation

3 - Potential for conflicts among VO members
4 - Alignment between VO’s core-values and VO members’ core-values
Alignment analysis between VO and potential members.

Alignment analysis among VO members
Exercise

- To develop a software application to Analyse Core-value System in collaborative environment.

1. What are the main functional Requirements?
2. What are the main user profiles (Actors)
3. What are the non-functional requirements.

CVS ‘s Network Analysis Tool

Overview
CVS ‘s Network Analysis Tool
Requirement Analysis - Overview

System

Network Manager

Value System Analysis

Member Manager

Value System Modeling

Knowledge Manager

Knowledge Management

Manager Application

Access Management

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CVS ‘s Network Analysis Tool
Use Case Diagram- Knowledge Management

Knowledge Manager

Add Core-value definition

Define causal relation among corevalues

Define Core-evaluation functions Models

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CVS ‘s Network Analysis Tool Use Case Diagram - Value System Modelling

Value System Modelling

- Define member Core-value System
- Define network Core-Value System
- Select the set of evaluation functions
- Define own Evaluation Functions
- Define the network

CVS ‘s Network Analysis Tool Use Case Diagram Value System Analysis

Core-Value System Analysis

- Core-values alignment analysis between CIO and its members
- Potential for conflict among CIO members analysis
- To obtain summary report about the core-values alignment
Exercise

Technological architecture - WHICH?

1. A central database / distributed database?
2. Freeware Technology?
3. Which expert system?
4. How to link database to expert system?
5. Clients, which applications they need to run this software application?

A Multitiered architecture.
Summary

As other issues in Virtual Enterprises, the study of Value System requires an multidisciplinary approach.

- We use the knowledge of engineering disciplines to:
  - **model the concepts** (UML, Algebraic Theory, Graphs)
  - **develop analysis methods** (Graph Theory, Causal Maps, Qualitative reasoning)
  - **develop software tools** (integrate expert system, data base system and web systems).