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first published in:  
The Journal of E-Business. - 6 (2006), 2 - 7 (2007), 1, pp. 53 - 64. - ISSN  
1542 0846

Postprint published at the Institutional Repository of the Potsdam University:  
In: Postprints der Universität Potsdam  
Wirtschafts- und Sozialwissenschaftliche Reihe ; 016  
<http://opus.kobv.de/ubp/volltexte/2008/1998/>  
<http://nbn-resolving.de/urn:nbn:de:kobv:517-opus-19988>

Postprints der Universität Potsdam  
Wirtschafts- und Sozialwissenschaftliche Reihe ; 016

# THE GOVERNANCE OF VIRTUAL CORPORATIONS

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## ABSTRACT

The concept of the virtual corporation (VC), which describes a modern form of collaboration among organizations, was introduced in the scientific discussion in the mid 1990<sup>th</sup>. The practice shows that VCs need new forms of governance because the traditional mechanisms of control, management, and steering are hardly applicable. Until now there is only a few research related to the question how to govern VC. The main problems to govern a VC are to coordinate the communication among dispersed partners and to motivate employees to actively involve themselves into the network. Open source projects are confronted with similar problems. As several governance mechanisms are already analyzed in this context, the authors analyze and adopt governance concepts from open source projects to extract a governance framework for virtual corporations. This new approach leads to innovative insights in governing virtual corporations by using community techniques as an appropriate way for communication and collaboration purposes.

## INTRODUCTION

Today corporations are confronted by a fundamental and sustainable change of their economic environment. New opportunities and risks face corporations. The competitive situation changes from local to global markets [1]. One result of these increasing dynamism and complexity is the vast emergence of new forms of collaboration among business partners. They share risks, get access to new knowledge and markets and add new competencies [2]. These developments are supported by the innovations in information and communication technology (ICT) which enable new forms of inter- and intra-organizational partnerships. These different trends are the economic forces of an ever increasing number of partnerships and electronic markets. Since the 1990<sup>th</sup> a special form of partnership is becoming increasingly important in the economy and has been discussed in the scientific literature: the virtual corporation [3].

A new topic in research is the governance of virtual corporations. It seems to be necessary to develop specific forms of governance to manage and lead virtual corporations successfully. In this meaning governance contains all mechanisms in steering a corporation, containing self-regulation and management-processes [4]. The aim of this paper is to start the discussion in this new research field.

## THE CONCEPT OF VIRTUAL CORPORATIONS

The first concept of a virtual corporation was outlined by Miles and Snow in 1984 [5]. They described an electronically linked partnership as a future form of corporations, which they called 'dynamic network organization'. In cause of the intensive use of ICT this form of organization was named virtual corporation in later publications. Especially Davidow and Malone explained this special form of partnership in their seminal book 'The Virtual Corporation' [3]. As this form of corporation is more flexible than traditional types of organizations [6] virtual corporations promise to be an appropriate solution for the threats of fierce

competition in a globalize and fast changing environment. A general definition of virtual corporations has been pointed out by Byrne [7]: *'The virtual corporation is a temporary network of independent companies, suppliers, customers, even erstwhile rivals – linked by information technology to share skills, costs and access to one another's markets. It will have neither central office nor organization chart. It will have no hierarchy, no vertical integration.'*

In addition to this definition, Byrne characterized five key elements of virtual corporations. First key element is the intensive use of ICT which links the partners and replaces contracts by mechanisms of social control and loose arrangements. The second element is opportunism in cause of taking opportunities. The temporary character of cooperation and the absence of contracts enforce this opportunism. Third virtual corporations feature excellence, which can be realized by the combination of the partner's core competencies. Thus, this 'best-of-everything' organization creates economies of scale and economies of scope [8]. The cooperation bases upon trust, which is the fourth key element. Finally the virtual corporation is a boundless organization due to the integration of manifold partners such as customers, suppliers, and competitors.

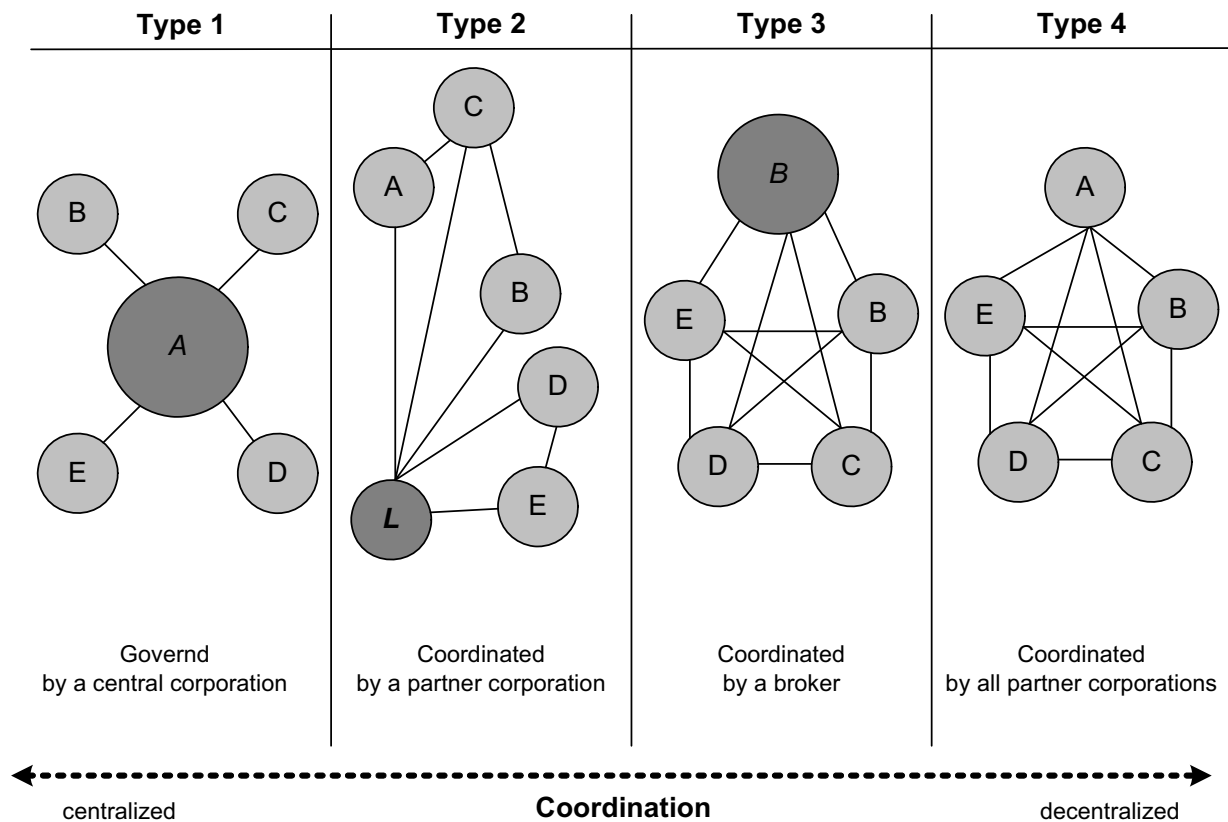
#### **FOUR DIFFERENT TYPES OF VIRTUAL CORPORATIONS**

However, in reality there exists not only one ideal type of a virtual corporation. Referring to Bickhoff et al. four basic types of virtual corporations can be identified [9]. (1) The first type describes a cooperation of partners which is governed by a central corporation. This can be described as a centralized network structure. In fact there exists a hierarchical structure and there are no equal partners in this network, thus this type differs from Davidow's and Malone's concept of a virtual corporation but in reality it exists quite often [10]. (2) The second type describes a virtual corporation that is coordinated by one single partner. This partner offers central services to partners but it has equal rights compared with them. (3) In the third type of virtual corporation, an independent coordinator, which is not directly integrated into the value creation process, the so called 'broker', offers central services. In this concept the broker is not involved in the production process. (4) The fourth type is determined by a common coordination of all partners. This form of virtual corporation characterizes the idealistic type of a virtual corporation where is no central control.

The following explanation of the 'experience gap' (section 2.4) refers to this fourth type of virtual organization, as the different types of organizational structures in virtual corporations basically determine the framework for a knowledge management.

(Continued on Next Page)

**Figure 1: Types of Virtual Corporations (According to [9])**



Because of working in projects, the cooperation in virtual corporations is temporary limited [11]. This limitation is an important element of cooperation in virtual corporations. On this account Rhode and Won [12] describe it as a fluid organization which links partners, changes their structure, add partners and remove partners. Virtual corporations never exist for a long time. The result is a life-cycle, which can be divided in four basic phases [13]: firstly the preparation phase, secondly the phase where the partners get linked together, thirdly the phase of working actively on a project, and fourthly the fade of the virtual corporation. Similar life cycles can be found in virtual communities which exist especially in open source projects [14]. There are also other effects such as network processes that affect the described lifecycle stages. Traditional economic literature discusses network influences such as “bandwagon”, “snob”, and “veblen-effects” in detail [15]. For extrinsically motivated co-workers, exhibiting their knowledge is a very important incentive for joining an open-source project. “Bandwagon” dynamics describe the case of successful open-source projects being of more benefit to co-workers who want to exhibit their skills. That is why such projects can grow even faster [16].

### **BARRIERS IN GOVERNING VIRTUAL CORPORATIONS**

Three barriers in governing virtual corporations can be identified. At first there are personnel-related aspects.

## **PERSONNEL-RELATED ASPECTS**

When governing distributed structures, the management of virtual corporations is confronted with a set of problems related to the organizations multilayered character. These problems are mainly of personnel and organizational nature.

The organizational aspect covers the following issues:

- (1) the selection of suitable partners [17];
- (2) the strategic positioning and the management [18];
- (3) the regulation and control [19].

The personnel-related aspects of virtual corporations depend on the social skills of the managers and their skills to coordinate networks, based on their abilities to establish, support and - if necessary - terminate (inter-) organizational relations. Psychological studies in the 1980s on cooperation and communication in virtual communities depict that computer-mediated communication is typically of a rather anomic nature [20], of a reduced tolerance [21], and is combined with the absence of transferable behaviour ([22], for a summary see [23]). Nowadays the changed environment causes completely new ways of medium-socialized collaboration, i.e. there is a majority of inexperienced employees within this new mediated organizational culture. To face these changes, Arnold et al. state that the network management has to be 'disembedded' of the central organizational processes to be reallocated in the network [24]. However, in order to develop an integrative and dynamic organizational culture the personal and organizational network competencies must demonstrate a flexible character. Ritter & Gemünden [25] argue that appropriate communication structures and personnel management procedures are of a crucial function. There is a close linkage between personnel-related and organizational/technical aspects: Due to ICT the problems arising from physical distances among co-operating partners diminish.

## **ASPECTS CONCERNING THE INITIALIZATION OF VIRTUAL CORPORATIONS**

The main obstacles in the preparation phase of a virtual corporation are to find the right partner. Another obstacle in the initializing phase of partnerships is the merging of contradictory goals. They must be synchronized to guarantee a successful collaboration. The preferred instrument is a centralized and network management that is mainly independent of a single partner and act as a trusted third party. By acting as an information broker it can easily focus on the shared interests instead of promoting a single partner only. Otherwise, decisions which are not held by the business partners will be counter-productive and thus endanger the success of a common project. In order to avoid such constellations, the ideas and visions of the partner firms should be congruent with the vision and aims of the virtual corporation, respectively the network. As a guarantee the virtual corporation needs to develop a joint history over a longer period and incorporate all partners into that process. This development of a joint culture which links the partners can also be found in open source communities. As a summary, it could be stated that virtual organizations have to be governed in general.

In order to cooperate successfully in virtual corporations with their often changing partners and conditions, a high flexibility is a prerequisite for the staff. Collaborations require decentralized competencies in decision-making; co-workers have to over take responsibility and have to solve conflicts on their own. Project management and controlling require additional qualifications, which are less demanded in traditional forms of organizations. The management should act less autocratically; it has to give up responsibility to their co-workers. Above all, managers have to be open minded for the investment into the qualification of their co-workers. Summarizing, the cooperation in virtual corporations requires well trained staff which adopt new communication and collaboration concepts.

In particular in this respect, there is a very close relation between virtual communities and open source communities (OSC). As research about OPC show, intrinsic motivation and non-financial incentives play a pivotal role in such collaborative environments.

### **MOTIVATION AS KEY ELEMENTS FOR COMMUNICATION AMONG EMPLOYEES OF BUSINESS PARTNERS**

One of the main challenges in virtual corporations is the establishment of an appropriate and efficient knowledge management. The knowledge management in virtual communities and virtual corporations (which are basically virtual communities) bases on three pillars:

- (1) shared culture for knowledge management
- (2) common technological basis
- (3) appropriate incentive structure to attract the members of the community to post the right information to the community.

In OSC it is common to share knowledge between the participating community members. As researches show this is not the case in many virtual corporations. The first reason for this fact is often the absence of a corporate culture which links the co-workers of a temporary virtual corporation. The second reason is the non-existence of innovative WEB 2.0 community technologies such as wikis or weblogs. Wikis are server based software solutions that allow users to edit content in intranets and the internet by using any Web browser. Hence, wikis allow the self-organization of content without any hierarchical control. A web log can be described as a personal journal or web based diary, which is frequently updated by a user.

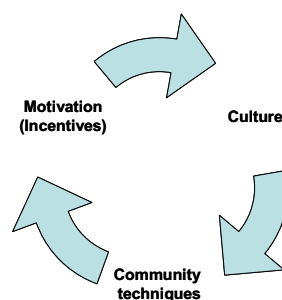
The motivation to perform basic open-source project tasks for programmers, managers, bug fixers, and co-workers [26] in OSC has been very well explored by various studies (see Table. 1). An appropriate governance structure must consider several attributes which are specific to the open-source project. Furthermore, the current lifecycle stage is another key element which must be considered when developing coordination tools. Because of the close relation between motivation and lifecycle stage [4], a governance model must be characterized by a dynamic structure. However, for a structured analysis each aspect must be evaluated separately.

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**Table 1: Motivational Incentives for Participating in Open-Source Projects. Source: [34]**

Motive	Example	References
Need for Product	Participating in order to create, customize, or improve, or feature	[27]; [28]
Enjoyment, Desire to Create and Improve	Participating because one enjoys it; finds creating or improving software creative and interesting	[29]; [30]
Reputation and Status within the Community	Participating in order to build or maintain reputation or status within the community	[27]; [30]
Affiliation	Participating in order to socialize or spend time with like-minded individuals	[31]; [27]
Identity	Participating in order to reinforce or build a desirable self-image	[31]
Values, Ideology	Participating to promote specific ideals, such as the free software philosophy	[27]; [30]
Training: Learning, Reputation Outside the Community, Career Concerns	Participating to improve one's skills, with the belief that such improvement will lead to a better job or promotion	[27]; [32]; [33]

As these incentives influence the motivation of co-workers they define the culture of a virtual corporation likewise. This process can be described as a governance circle in virtual corporations.



**Figure 2: Governance Circle**

## **THE GOVERNANCE OF VIRTUAL CORPORATION**

### **Structure Versus Technology**

As a consequence, virtual corporations have to develop strategies to manage this governance circle successfully. Starting from an organizational view, one option is to integrate a centrally acting broker in the structure of the virtual corporation, which goes along with a switch in the organizational structure of the virtual corporation from a complete decentralized structure (see type 4 in fig. 1) to the 'broker model' (see type 3 in fig 1). A neutral broker institution may support the partners in respect to coordination, technical support (provision of a single ICT platform), and other supporting functions without establishing any hierarchy.

As Abecker et al. state [37], it seems to be appropriate from a technological perspective to set up a dispersed but technologically integrated knowledge management system (ubiquitous criterion) with open interfaces to allow rapid growth and high adaptability (growing criterion) and standards to ease the connection of dispersed partners (seeding criterion). Such a knowledge management infrastructure is necessary to keep actual and useful (activity criterion) explicit and implicit knowledge in the network (collections criterion). Such ICT infrastructures are usually applied in OSC. Such an infrastructure take three issues into account: Firstly the partners are interconnected as flexible as possible, to enable a fast and easy entry or exit of partners. Secondly, such an infrastructure reduces knowledge and experience barriers as well as costs. Thirdly the ICT-infrastructure supports main functions of a virtual corporation [35]. One of the main functions of such an ICT-system for virtual corporations is the storage of project data from current and further projects [36]. If one partner retires after a project, at least the explicit knowledge is saved in a central database and can used by the other partners in further projects.

Bringing the organizational and the technological view together, both, the knowledge management and coordination efficiency may be enhanced. The brokers' tasks may be enriched by qualifying the incoming data from the partners, performing reports and separating important from irrelevant information. These two approaches constitute the basis to an efficient distribution of information sharing among the network partners.

However, the organization of a virtual corporation should not stop at this point. The network must include mechanisms, or systems, respectively, which promote self-learning and self-organizing.

### **Governance Concepts for Knowledge Sharing**

The problem of encouraging or attracting employees in virtual corporations to get actively involved in group processes or value-creation processes is well-known from other forms of collaboration (e.g. Customer Integration [26], OSC [4]). Active coordination must be dedicated to new mechanisms that increase the motivation of the co-worker as depicted in the following section.

### **Governance through Manipulation of Intrinsic Motivation**

Factors that manipulate intrinsic motivation are difficult to identify because it has been unclear until now how intrinsic motivation evolves [38]. However, recent research based on the open-source community underscores basic conditions influencing intrinsic motivation. Benkler identifies two threads of intrinsic motivation: The failure of integration, in which individuals see their capabilities as being wasted, and a unilateral appropriation, in which the individual contributor "tries to make the common project reflect his or her values too much, thereby alienating other participants from the product of their joint effort." [39]. Furthermore, various studies point out that co-workers' motivation increases if they are allowed to select activities and tasks on their own (e.g., [38]; [40]). This suggests that co-production thrives when projects have at least the following two characteristics [39]:



- *Modularity of projects*: Projects must be divisible into components or modules to enable independent production.
- *Granularity of modules*: Granularity refers to the sizes of the project's modules.

### **Governance through Direct Manipulation of Extrinsic Motivation**

As depicted in Table 1, the co-worker's extrinsic motivation is based on ideologies (e.g., [27]; [30]), the need for a product or a product specification [28], fun [30], reputation [33], the need for social integration [27], and other training and career concerns [33]. These motives can be governed actively in open-source projects and professional environments by offering adequate incentives or by using sanctions which are not necessarily based on financial issues. For example, a project can satisfy a co-worker's motivation of career concerns by offering training courses or by certifying the co-worker's participation, which may be useful for the co-worker's future career. Need for personal success may be satisfied by arranging competitions among co-workers. Social acknowledgment and integration are affected directly by the project developing concepts such as "Co-Worker of the Month," or by designating "Very Important Co-Workers (VIC)" [26].

However, if there is no consultation with the concerned co-worker or group when a project manager selects incentives and sanctions, governance may provide the wrong external incentives. This may lead to unintended results such as the displacement of internal motivation. Incentives yield different reactions from co-workers based on the co-worker's own motivational background and actual stage of the collaboration. Thus, general rules for managers in arranging 'direct co-worker governance' cannot be derived.

### **Governance by Self-Regulation by the Projects**

However, mechanisms may be implemented which are based on self-regulation that utilizes community processes. Such mechanisms are particularly effective sources for disciplining and influencing individual co-workers who are motivated by the need for social integration or reputation and who identify with their reference group (e.g., [40]; [41]).

Analyses of interaction patterns in online communities provide useful insights. Electronic media are intensively used for interaction, communication, and transaction in online communities. They may lead to these three electronically supported and basically self-regulated processes: competition among members, enforcement of the possibility of social exclusion from the community, and the arrangement of peer-review procedures.

#### *Example 1: Competition among Project Members*

Recommender systems [42], which are well-known from e-commerce platforms such as eBay or Amazon are ICT-supported methods of controlling communities. Such mechanisms are also applicable for the governance in virtual. For example Amazon offers their customers web-supported "topic lists" to classify other customers as "friends and favorites." Implicitly, this method uses social exclusion and competition mechanisms. Employees could use these functions to 'flame' colleagues. 'Flaming' is frequently applied method in the open-source community in which volunteers are publicly denounced on electronic blackboards [43]. All these instruments seem to be feasible for the governance in virtual corporations, too.

#### *Example 2: Peer Review Procedures*

Another appropriate method for social in-, or exclusion is the implementation of peer-review processes (e.g. for project work products, project document) [39]. The quality of a peer-review process based substantially on activeness and seniority of volunteering partners. The introduction of ethical rules about the behaviour in the (online) community may extend this concept, e.g., if misconduct and violation of ethics rules lead to exclusions.

Peer-review procedures can be easily utilized. There are several different forms of peer review procedures, such as the *hierarchically managed review procedure*. This kind of review is implemented in all large open-source projects such as Linux or Apache. Such a procedure may be applied in virtual corporations with make use of a broker. Another form of peer review is the *peer production of relevance and accreditation* [39]. Users comment on initial submissions that cover a variety of technology-related topics. A very appropriate review procedure for virtual corporate networks is the 'Social Organization', which is implemented in a highly sophisticated way e.g. by Wikipedia's objectivity norms, which are special methods of social control [44].

Thus, to implement community-based co-worker governance, an virtual corporation must initialize strong social structures first. Peer-review procedures, a competitive environment, and an application procedure are mechanisms which may manipulate the extrinsic motivation of employees in a positive way.

## SYNOPSIS AND OUTLOOK

In this contribution the authors described analytically the problems of governing VCs. Due to the specific characteristics of VCs (project orientated, timely limited etc.) and their employees (flexible, open minded, etc.) coordination is more difficult than in traditional corporations. OSPs have similar elements, structures and problems in respect to governance issues like VCs. Thus, already analyzed governance mechanisms in OSP can help to define a framework for the governance of VCs. Starting with these insights, further work needs to concentrate on empirical analysis of the problems in VCs and secondly strategies for a specific ICT in virtual organization have to be worked out.

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