

JOURNAL OF INFORMATION SYSTEMS APPLIED RESEARCH

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Creating a Framework for Research on Virtual Organizations

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Abstract

In recent years the concept of the virtual organization (VO) has received a great deal of attention in both the business press and academia. While a fair amount of research has focused on the virtual organization, very little agreement exists on how to define it, or even approach it as a concept or an organizational form. This makes it difficult to build a coherent research stream in virtual organizations, as there is no good way to link the research that has been done. In fact, it is impossible to relate or compare the research that has been done under various definitions of the VO without a common framework to relate them to one another. The purpose of this paper is not to develop another definition of the virtual organization, but rather to provide a definitional framework for the virtual organization which can assist researchers in relating the work done on VO's using various definitions.

Keywords: Virtual Organizations, frameworks, virtuality, outsourcing

1. INTRODUCTION

With the adoption of the Internet and other associated computer and telecommunications technologies by organizations worldwide, a great deal of attention has been paid to the new forms of organizing these technologies have enabled (Drucker 1998; Hughes, O'Brien et al. 2001). The distributed and pervasive nature of the Internet, and the ease with which companies can now communicate across great distances, have made new forms of organizing possible for companies. These various forms of organizing have attractive benefits for firms, including cost savings and increased flexibility (Drucker 1998). As companies have taken advantage of these new technologies to distribute their work and workers, they have moved towards being "virtual organizations".

But what is a virtual organization? Despite the widespread use of the term in the press since

it's conception in the early 1980's (Mowshowitz 1994), there seems to be little agreement in the academic literature on what, exactly, this is. Some of the definitions are exclusive, trying to define the exact qualities of a VO (Walter 2000; Rahman and Bhattachryya 2002). For example, "a temporary network of independent linking by Integrated Technology to share skills, costs, and access to one another's markets" is one definition (Rahman and Bhattachryya 2002). This definition certainly conjures the image of an organization that is the opposite of every "traditional" brick and mortar organization.

Other definitions tend to be more inclusive, viewing the VO as a trend or framework rather than a specific type of organization (Venkatraman and Henderson 1998; Mowshowitz 2002; Shekhar and Ganesh 2007). For instance, Venkatraman and Henderson (1998) state "...we treat virtualness as a

strategic characteristic applicable to every organization". An example of an inclusive definition is "A virtual organization is any organization with non-co-located organization entities and resources, necessitating the use of virtual space of interaction between the people in these entities to achieve organization objectives" (Shekhar and Ganesh 2007).

Regardless of which definitions are used, the organizations in question are referred to as "virtual", both in the business and academic literature. This can present some problems, as the first definition presented could POTENTIALLY be applied to the open source software movement, while the last definition could be used to refer to any modern multinational company. The use of multiple, conflicting, definitions in various articles leads to problems for the researcher. Which research findings, using which definitions, can be applied to any given piece of research? How can we, as researchers, determine which articles contain theory that could be used for a given research setting? This has led to some confusion within the field and serves as a barrier for developing and applying theories to this phenomenon.

This situation is further complicated by the fact that outsourcing is, conceptually, closely related to the virtual organization. By outsourcing certain activities, an organization is becoming more virtual (Shekhar and Ganesh 2007). The many concerns and challenges associated with outsourcing various business functions are generating a great deal of interest within the literature, again both popular and academic, because of the possible benefits and pitfalls of following this strategy. This important area of study falls under the enormously broad umbrella of virtual organizations. Finding a way to align the concept of the virtual organization and outsourcing would be very valuable for research, as it would provide the field with a common point of reference. The framework presented in this paper could be used to help determine the common ground between the research on virtual organizations, and that of outsourcing.

A common framework for definitions of the virtual organization would allow the academic community to have a common frame of reference, and would also allow us to more easily establish boundary conditions for the theories that are used to study these organizations. This is required for progress to

be made in this area, as it does not seem reasonable to assume that a theory that works in a purely traditional organization would work in a purely virtual one or vice versa. And, again, the broad varieties of the definition of virtual cause problems here. If a study finds a certain factor contributes to success for one definition of the virtual organization, would it contribute to all of them? Rather than saying the research is examining a virtual organization, it would be able to specify the *type* of virtual organization within that common framework. The purpose of this paper is to examine the existing literature on virtual organizations and then suggest a common framework for that research.

This is done by first presenting a review of the literature in section 2. In section 3, the proposed definitional framework is presented and defined. In section 4 future work in this area is discussed, and section 5 presents the conclusion.

2. LITERATURE REVIEW

The term virtual organization was first introduced to the language in the early 1980's (Mowshowitz 1994), though it did not receive much academic attention until the early 1990s. Since this time, the concept of the virtual organization has become firmly entrenched in the literature and in the minds of researchers and business professionals.

Many definitions of the virtual organization, especially those early definitions, showed some tendencies towards technological determination. These definitions assumed that because the technology was available, there would be no more "traditional" companies in the future (i.e. (Rahman and Bhattachryya 2002)). All products and services would be developed and delivered by joining unrelated entities together to use their specialized skills. These temporary organizations would stay together long enough to accomplish the task and then disband. This type of organization would, according to this line of thinking, completely replace the "old" form as individuals and organizations realized the enormous efficiencies to be gained (Walter 2000; Rahman and Bhattachryya 2002).

While not all of the definitions had these tendencies towards technological determinism, some had a tendency to create narrow definitions of a virtual organization (i.e. (Walter 2000)). A good example of a narrow definition comes from Travica (1997): "VO's

(virtual organizations) refers to a new organizational form characterized by a temporary or permanent collection of geographically dispersed individuals, groups or organization departments not belonging to the same organization – or entire organizations, that are dependent on electronic communication for carrying out their production process” (Travica 1998). While this definition does not carry any type of technological determinism, it is a very narrow definition, and a reasonable example of a number of others. This does not cover any number of possible permutations of virtuality that organizations are exploring that have been categorized as virtual by other publications.

Other definitions tended to create overly broad categories, such that virtually any large multinational corporation would be defined as a virtual organization. For example, Rahman and Bhattachryya defined a virtual organization as “an organization distributed geographically and whose work is coordinated through electronic communication” (Rahman and Bhattachryya 2002). There are a number of broad definitions of the virtual organization (Chutchian-Ferranti 1999; Kishor and McLean 2002; Zhuge, Chen et al. 2002), which may have contributed to research moving away from categorizing the virtual organization as a single, definable thing, and lead to it being classified more as a movement.

For example, defining the virtual organization as an architecture, rather than as a specific organizational type (Venkatraman and Henderson 1998) moves us away from the notion of a virtual organization as a single specific thing. While this provides a useful abstraction from overly narrow definitions, it also makes it difficult to talk about a single type of virtual organization, or what theories or management methods could be used at a given organization. While many VO’s are unique, and make use of different aspects of virtuality, it seems likely that there would be some characteristics that would link them and enable some cross study.

Contributing to this line of abstracting the virtual organization, the virtual organization was introduced as a theory, rather than as a specific definition. In a recent book: “We refer to it variously as a paradigm or principle to emphasize the lack of any specific organizational form attaching to it.” (Mowshowitz 2002) While the concepts and

broad definition presented in this work can encompass the many permutations of the virtual organization, its very flexibility makes it difficult to apply in research.

While one stream in the research on virtual organizations was moving towards defining the VO as a paradigm or framework, another was exploring the concept that companies exist along a continuum of virtuality (Goldman, Nagel et al. 1995; Hoffman, Novak et al. 1995; Burn and Ash 2000). The concept that organizations can be more or less virtual has been introduced in several papers (Venkatraman and Henderson 1998; Panteli and Dibben 2001). There have been several approaches to this, but none have provided very clear definitions of how to measure the virtuality of the organization. While these articles agree that the organization can adopt many points along a line, they are still all classified as a virtual organization. This also causes some problems, as there will clearly be different challenges for organizations located at different points along the “virtuality curve”.

While research and interest in virtual organizations, and in making organizations more virtual, continues, little has been done to settle on a set of terms for the virtual organization. In fact, changes in the availability of skilled labor in a number of markets around the world has opened up new areas for research and practice in the area of virtual organizations as more organizations experiment with various ways of achieving virtuality.

Regardless of the definition used, the term is used frequently in both the business and academic press. This is due to the enormous implications of turning into a virtual organization (Koch 2000; Coates 2001; Staples 2001). Many articles have noted the potential implications for the firm (Venkatraman and Henderson 1998; Markus, Manville et al. 2000), the employees (Parus 1999; Koch 2000; Coates 2001; Ariss, Nykodym et al. 2002) and society at large for the changes that these organizations are currently undergoing. The sheer implications of this new organizational form demand a great deal of research, but how does this research fit together? Do the theories examined in these various articles fit together? Can the findings from one article looking at the VO be applied to another, or only in certain circumstances?

This confusion calls for a clearer structure in which to discuss the virtual organization. It is clear that there is not a simple, concise definition that will both encompass the many potential forms for the organizations and allow the level of specificity required by the academic community to perform the type of research that must be completed to understand this phenomenon. What can be done to reconcile these various definitions?

3. DEFINITIONAL FRAMEWORK

While there are many different definitions for the virtual organization, several concepts are consistent across them. Specifically, the concepts of geographical dispersion, duration, ownership of resources, level of control over the organization and the level of electronic communication appear with great frequency in the discussion of virtual organizations. Each of these concepts is explored in turn, and then applied to the framework proposed in this paper.

It is generally agreed that the virtual organization is more widely distributed geographically than the traditional organization. While the level of dispersion is not defined (i.e. from Dallas to Ft. Worth, or from Chicago to Mumbai), the idea that the resources required for the production of goods or services are spread out in a virtual organization is broadly used. The geographical distribution of the organization adds certain challenges that "traditional" organization might not face. These challenges would include distribution of work across multiple time zones and cultures (Hughes, O'Brien et al. 2001).

Next, duration is a consideration for many of the definitions of the virtual organization. In some of the more radical definitions of the VO, groups come together for short periods of time, perform a task and then disperse (Byrne 1993; Katzy 1998). This can be very common when looking at temporary partnerships formed by organizations (Malhotra, Majchrzak et al. 2001). Duration is also consideration for the study of outsourcing – the length of time for the contract is certainly a factor for these types of arrangements.

It is also common for definitions of virtual organizations to state or imply that the organizations have a lower level of ownership of resources than is typical for the traditional view of the organization. One example of this would be outsourced manufacturing (Ariss, Nykodym et al. 2002). The concept of

ownership also encompasses the notion of control – organizations that own the resources, more clearly have control over them than those who have outsourced these items to another organization. In the case of the open source software movement, there is no central control over the organization, and there is no ownership of the "organization" that is writing the software (Markus, Manville et al. 2000). In fact, the term organization is used very loosely here, as it is really an assembly of individuals with a common interest and skill set who work together to achieve a common goal – the very image of the exclusive definitions mentioned earlier in the paper.

The level of control exhibited by a virtual organization does help to define how virtual it is, but it seems that this concept could be usefully combined with that of ownership of the resources. It would be reasonable to expect that a company, which owns or employs the means of production, would have a greater level of centralized control over them than an organization which did not own or employ them.

The level of electronic communication is assumed to be high in virtual organizations, because it is this technology that first enabled the organizational form (Drucker 1998; Venkatraman and Henderson 1998; Mathias 1999). However, especially early research in VO's stated that not every organization will use the same level of electronic communication, because not every organization is as virtual as every other. While electronic communication is used frequently in the definitions, the majority of organizations use electronic communication today. Thus, this does not seem to be a good measure of the "virtual" organization.

In order to relate the various definitions to one another, this study has constructed a framework using the factors discussed above. For this framework, the concepts of Ownership, Time and Geographic Dispersion are used. By combining these three concepts, the framework presented in figure 1 (see Appendix 1) can be used to associate the various articles written on VOs and relate them to one another. By placing each concept along a continuum, we allow for varying degrees of virtuality along multiple dimensions. We also arrive at natural dividing lines between different types of virtuality by looking at the eight sectors formed by the three dimensional representation of the framework.

This framework provides a method to relate both the definitions that have been presented in the literature, and to relate the various studies that have been performed on VOs. This is not intended to be a comprehensive list all of the theories that apply to each sector, but rather a starting point. Likewise, this is not intended to be a comprehensive list of organizational forms, but it does provide some examples of what could be expected within each of these sectors.

Sector 1:

High Dispersion, High Ownership, Long Duration

This could apply to any traditional multinational organization. They are highly dispersed, own their plants, and frequently use electronic communication as the only means of communication. An enormous amount of research has taken place in this sector in both Management and Information Systems. Some examples of this would include major auto makers like General Motors and Ford. Both are headquartered in the United States, but both sell cars on six continents under various brands and have for a long time.

Sector 2:

High Dispersion, Low Ownership, Long Duration

This could be an example of a company that has off-shored some of its operations. It is highly dispersed, does not own the operations and uses electronic communications extensively. Examples could include Dell and Apple, which have both outsourced their manufacturing. Dell could be an even better example, based on the number of operations they have outsourced. The open source movement (i.e. Linux) could also fall within this category (Markus, Manville et al. 2000). This sector would also encompass those more radical definitions of the VO (i.e. (Hughes, O'Brien et al. 2001)).

Sector 3:

High Dispersion, Low Ownership, Short Duration

Some of the definitions used for short term VOs could be applied here. For instance, creating a short term VO to accomplish a single task, after which it is dispersed (Byrne 1993; Hughes, O'Brien et al. 2001). Certainly,

companies do form relationships like this to seek out specific business opportunities.

Sector 4:

High Dispersion, High Ownership, Short Duration

It is hard to imagine a good example for this particular sector. A highly dispersed organization, that is centrally owned/controlled, but that doesn't last long. This sounds more like a failed business than a VO, but by combining these factors, it is certainly possible to create a sector that would be unlikely to be populated. This could also be a model for a centrally controlled organization that is widespread, but with a set purpose that expires at a particular time. Perhaps the organizing committee for an Olympic bid would fall under this sector – a group with a highly centralized structure for ownership, a set time limit for its duration, but one that could be spread across a wide area.

Sector 5:

Low Dispersion, High Ownership, Short Duration

This sector could be used to look at the more recent trend towards "near shoring" in outsourcing. That is, the practice of outsourcing certain operations, but doing it to companies that are geographically close to headquarters, rather than overseas. The difference for this sector being that they have "near shored" to a wholly owned subsidiary of the company, rather than an outside agency.

Sector 6:

Low Dispersion, Low Ownership, Short Duration

This could be an example of a company that has temporarily "near shored" its operations, possibly even outsourcing them to a company locally. This has been occurring with greater frequency, especially in Europe. This sector shares some properties with sector 2, but would not be as likely to have some of the problems with cultural norms and time zones that organizations in sector 2 would.

Sector 7:

Low Dispersion, Low Ownership, Long Duration

This would be an example of a long term, near shoring arrangement for an organization. This could also be applied to some more traditional supplier relationships in manufacturing – the

manufacturing of certain components is contracted out to another company in the area for an extended period of time to save the company the problems associated with making that particular part.

Sector 8:

Low Dispersion, High Ownership, Long Duration

This would be an example of a small town operation. They have very few locations, and own all of the operations. Of course, even this business model would be challenged by the fact that many suppliers now have their order entry systems on line and could be requiring their customers to use that means of communicating with them. Organizations like this one could still benefit from some level of "virtualization" by tying into their suppliers electronically, thus using them as virtual warehouses, rather than keeping all of the required stock on hand.

Many of the definitions currently in the literature are good for pure VO's, or work well at a high level. However, narrow definitions leave us to conclude the virtual organization is a rare beast indeed, while high level definitions leave a great deal open to interpretation. By setting up a framework represented by a three dimensional model, this paper helps establish some boundaries that can be recognized when talking about Virtual Organizations, and provides a way to classify and compare the research that has taken place under the varied definition of VO.

While a broad definition of a VO (like those given in some of the literature) would allow a company to fall into any sector, looking at the factors presented in this framework would enable the researcher to restrict the organization to a single area. Doing so would allow the researcher to determine what theories might apply to companies within those sectors or help companies trying to move between them and to determine what strategies should be employed and what skills will need to be developed to be successful in these endeavors.

4. FUTURE WORK

An area for future work in this area will be the development of reliable measures for each of the axes presented in the framework. This would allow for an easy comparison of results

across multiple studies and would also define what the break points are for each axis in the framework. While work has been done on each of these measures, it is beyond the scope of this paper to try to integrate them into a unified whole.

Examining which theories will hold in each of these sectors is also a rich area for future study. While there is certainly a great deal of research that could be classified as belonging to one sector or another, determining which theories can go between these would be a worthwhile endeavor.

5. CONCLUSIONS

In this paper, the past literature on Virtual Organizations has been briefly reviewed and an operational framework for future research in the area has been presented. The purpose of this paper was not to create another definition of what a virtual organization can be, but rather to provide a framework on which to build future research and to provide possible boundary conditions for the various theories and definitions of the virtual organization.

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Appendix 1 – Figure 1

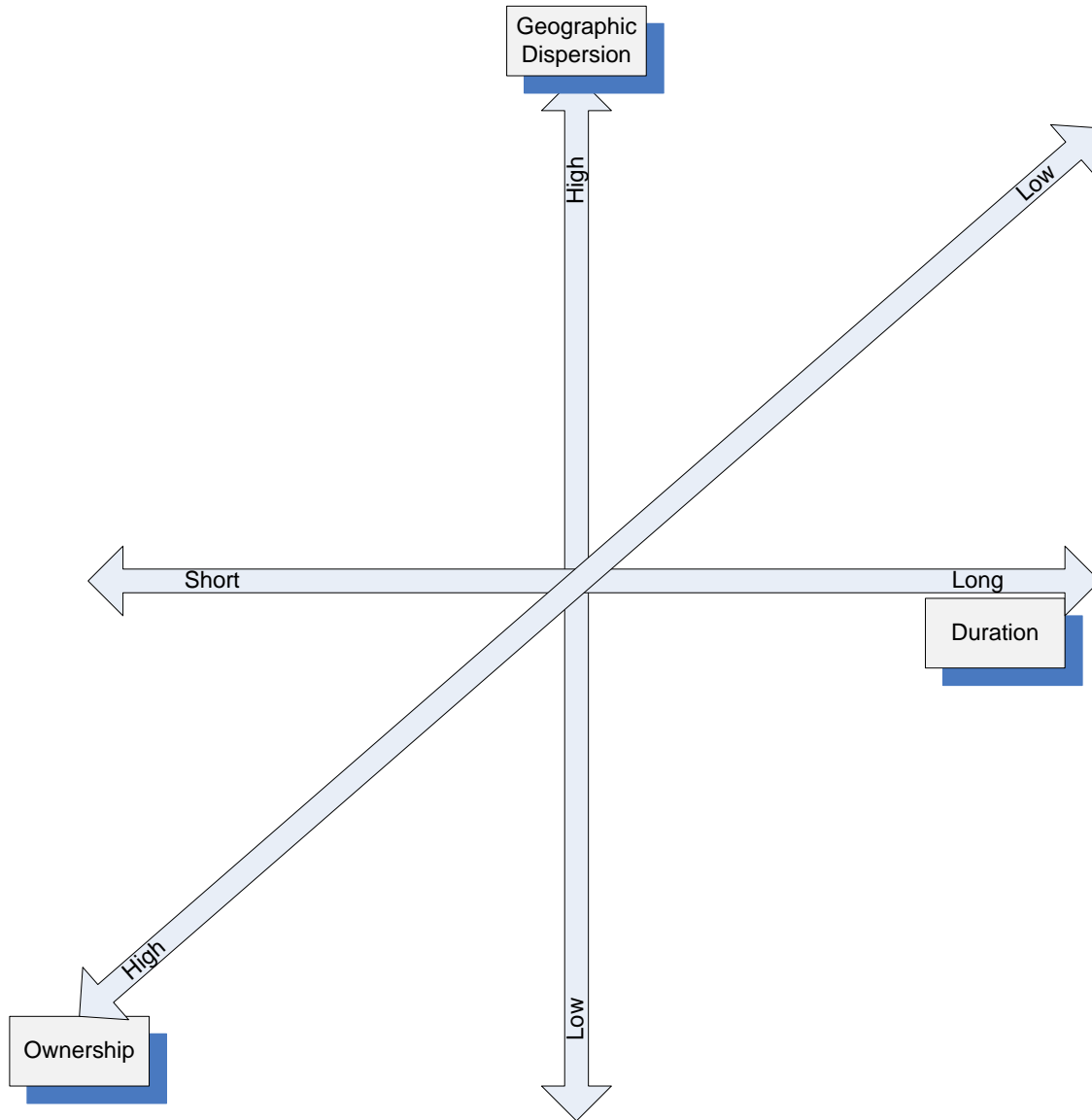


FIGURE ONE – A Framework for the research of Virtual Organizations