# The ISSAAC Model of Virtual Organization

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## INTRODUCTION

Modeling of virtual organization (VO) can be a useful method of making sense of a plethora of organizations that are proclaimed to be "virtual," "virtualized," or to exhibit "virtualness." Since the advent of these notions (Byrne, 1993; Davidow & Malone, 1992; Mowshowitz, 1994), an enormous proliferation of VOs has followed in theory and practice across academic disciplines and industries. Being "virtual" had almost become a fashion embraced by corporations and other businesses, groups of organizations engaged in cooperation/collaboration or trading, libraries, schools, government organizations, non-government organizations, churches, museums, and so on. The implication of these developments is that it has become difficult to reach an agreement on what VO is beyond the customary agreement at a lexical level. Lexically, the virtual character refers to a potentiality and effect that divert from the actual appearance of a virtual thing (Webster, 1988). Thus, a VO is an effect of interaction of what in fact are different organizations or constituents of organizations (groups and individuals). Introduced by inventors of VO, this axiom has remained undisputed to date.

In contrast to the elementary consensus, controversies loom large with respect to: (a) identifying necessary and sufficient conditions for existence of VO; (b) differentiating VO from other cognate kinds of organizations or organizing; and (c) explaining relationships between different VO designs (forms). For example, many researchers agree that spatial dispersion is a necessary condition for VO to exist (e.g., Lipnack & Stamps, 1997). But is it a sufficient condition, as some researchers of virtual teams and virtual offices seem to imply? Similarly, while researchers of information systems concur that computing and telecommunication technologies are indispensable for connecting members of a VO (Venkatraman & Henderson, 1998), some management scholars posit that technology makes no difference, and so they may seek examples of VO in pre-electronic times (e.g., Warner & Witzel, 1999). Yet another controversy concerns the juxtaposed paradigms

of form and capability: Is VO a distinct organizational form/design (e.g., Davidow & Malone, 1992; Travica, 1999), or it is rather a capability to collaborate with others beyond conventional bounds, a capability of "virtualness" (virtualization) that any organization can have (e.g., Sieber & Griese, 1999; Venkatraman & Henderson, 1998)?

Differentiating between VO and other organizations is nonetheless challenging. In particular, separating VO from the network (networked) organization is a demanding task. The network organization was historically first (Aldrich & Whetten, 1981) and some models of the network organization spearheaded conceptualizations of VO. For example, Miles and Snow's (1986) model of dynamic network was based on outsourcing of business functions ("vertical delayering"). This is apparently similar to Byrne's (1993) equating of VO to a temporary network of suppliers, customers, and rivals. Indeed, it is not questionable if a VO exhibits a network dimension (Child & Faulkner, 1998). Rather, the problem is to determine how this dimension is related to the virtual character of organization. Finally, establishing relationships between different designs of VO is another point of contention. In contrast to the issue of differentiating between the network and virtual organization, the problem here is to identify similarities between different organizational entities labeled with the prefix "virtual." Do virtual corporations, virtual teams, virtual alliances, and other organizations claiming the virtual legitimacy have something in common? Are there dimensions that all these have to share? Is there a parent model of a VO from which the shared dimensions can be inherited? With rare exceptions (e.g., Child & Faulkner, 1998), the VO literature neglects these questions.

These dilemmas and controversies are significantly determined by the fact that a number of authors do not use explicit ontological models of VO. Rather, many implicitly assume what VO is, and then focus on investigating some social, behavioral, and technological dimensions of such arbitrarily selected population of study. The following discussion has roots in the field

of information systems, and it draws on the premise that formal modeling of VO can be instrumental in resolving the mentioned theoretical problems. Models of different VO designs that can be found in the literature or inferred from it will be discussed, and a general ontological model of VO will be presented.

## MODELING VIRTUAL ORGANIZATION

A general ontological model of VO should be able (a) to determine which organization is virtual and which is not, and (b) to assess the breadth and depth of virtualization. The model should be accompanied by clearly stated assumptions and definitions, and it should be suitable for guiding research and explaining core aspects of any VO form.

The study of VO began with descriptions rather than models. In their seminal work, Davidow and Malone (1992) charted the concept space of "virtual corporation" by providing an inventory of possible dimensions of VO: a temporary association, the goal of harnessing swiftly a sudden market opportunity, delivery of a virtual product (instantaneous production and customization), use of a sophisticated information network and computer-integrated production processes, changing and permeable boundaries that involve suppliers and customers, amorphous structure, and a need for maintaining trust among constituent members lacking physical contact. It is not clear whether these dimensions are cumulative and how are they related. This inventory inspired many researchers. But they typically focused selectively on parts of the concept. Consequently, almost any of the dimensions could suffice for obtaining the VO legitimacy—a temporary inter-organizational arrangement, moving operations to computer networks, and so on. The arbitrary inclusion of particular VO dimensions was sometimes coupled with a deliberate exclusion of other dimensions. Such is the case of the cited elimination of the technological condition.

### Virtual Task

In spite of this primal ontological "sin," the beginning was also marked by an attempt at formal modeling of VO. Mowshowitz (1994) provided a mathematical model of *virtual task* that, in his view, explained VO. Based on a number of the author's ensuing works this model became known as the switching principle. Figure 1 depicts a possible graphical representation of the virtual task/switching model. The model postulates that a VO meets its production requirements by searching for alternative satisfiers—external trading partners. The search is dynamic and continuous, and its outcomes are determined by cost/benefit concerns that are depicted as moderating variables in Figure 1. The author maintains that the switching model of VO applies to any social organization (virtual corporation and virtual team alike) as well as to virtual objects in the technological domain, such as virtual memory (Mowshowitz, 1999).

The virtual task/switching model of VO explains the organization of work (business task or process).

*Figure 1. Virtual task/switching model*
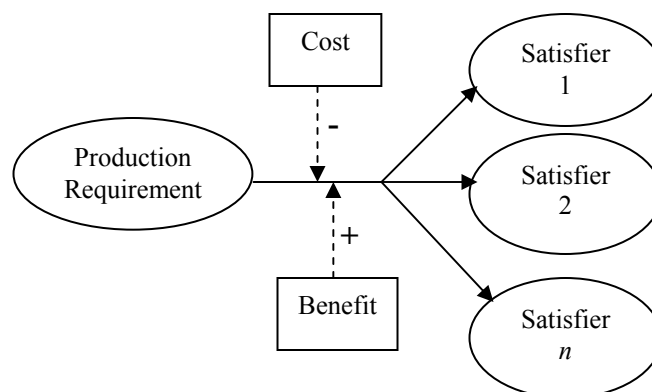
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