



Adopting organizational virtualization in B2B firms: An empirical study in Singapore[☆]

Chunhui Liu^{a,*}, Choon-Ling Sia^b, Kwok-Kee Wei^b

^a Department of Business and Administration, University of Winnipeg, 515 Portage Avenue, Winnipeg, MB R3B 2E9, Canada

^b Department of Information Systems, Faculty of Business, City University of Hong Kong, 83 Tat Chee Avenue, Kowloon, Hong Kong, China

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ABSTRACT

We empirically tested a parsimonious model that incorporates cost-benefit analysis/transaction cost theory, institutional theory, and organizational capability-based theory to predict organizational adoption of IT-facilitated virtualization in an Asian context. Virtualization implies the use of IT and communication technology by organizations in managing their interactions and key business operations with stakeholders, such as customers, suppliers and employees. Our research extends existing literature by using organizational structure adoption theories. The study should provide insights into the salient adoption issues of Asian firms. A survey was conducted of B2B organizations in Singapore. Results indicated that an increase in the level of net perceived benefits, external influences, and organizational capabilities had a positive effect on organizational decision makers' intention to use virtualization. In particular, external influences were found to be the most important antecedents of intention to adopt virtualization in B2B organizations in Singapore.

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1. Introduction

Virtual organizing (VO) or virtualization has been considered as a new paradigm for building competitive advantage [31]. It can be viewed as an organizational design practice that results in flattened organizational structures, larger spans of control, and extensive geographically dispersed work. VO uses IT in organizations to expand their business by improved interaction with stakeholders. To provide flexibility, many organizations have combined core competencies to respond better to specific customer need and preferences. Specific advantages of VOs have been stated to be increased productivity, adaptability, flexibility, agility, and strategic competitiveness [24].

Khalil and Wang [16] noted that VO is increasingly being recognized as an integral part of e-commerce. U.S. Commerce Department reported that the US e-commerce sales sector grew 19% in 2007 to \$136.4 billion. The Bitkom industry association reported that the volume of Germany online sales reached €438bn

in 2006, 90% of this is from B2B sales; it also predicted that the volume of online sales would reach €781bn by 2010, more than 80% of which would be sales between businesses [28].

Despite many predictions of the fast and broad acceptance of VO and successful cases like Dell Computers, Cisco, Boeing, Coopers & Lybrand, etc., it was not as widely adopted as expected. It has been argued that the present stage of e-commerce involves a much slower embedding of the virtual in the physical [34]. This is particularly true in Asia (ex-Japan) where VO adoption has not been widely reported [33]. Past studies conducted in the West have shown that factors important to organizations that had adopted virtual firm structures included cost reduction [4], IT [19], and trust [11].

However, it is not clear whether such considerations are as important to organizations in Asia. For instance, recent work involving Asian organizations have shown that external institutional forces sometimes influence the adoption decision more than internal organizational considerations [17,23]. This might be due to the collectivistic tendencies of Asian businesses. It would thus be useful to identify the factors that influence organizations' decisions to virtualize in the Asian context. Furthermore, a study of external contingency factors affecting VO adoption in firms is important because firms that are open are more influenced by and respond to external environments [15]. An understanding of virtualization could therefore be achieved by examining both

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* Corresponding author. Tel.: +1 204 786 9902; fax: +1 204 774 8057.

E-mail address: m.liu@uwinnipeg.ca (C. Liu).

internal and external factors that lead to the intent to be a VO, as a precondition to actual becoming one.

2. Conceptual foundations

2.1. Innovation adoption intent formation

The Theory of Planned Behavior (TPB) [1] posited that the immediate antecedent of a given behavior is the intent to perform it and that it can be predicted by knowing the person's beliefs towards the behavior: attitude, subjective norm, and perceived behavioral control.

2.2. Innovative organizational structure adoption theories

Many theories have been developed to explain why one type of organizational structure is adopted over others. Three of the most prominent perspectives are cost-benefit analysis or transaction cost theory, institutional theory, and an organizational-capability-based theory of governance structure. Each of these emphasizes a specific aspect of adoption.

2.2.1. Cost-benefit analysis and transaction cost theory

Cost-benefit analysis is used to determine which alternative has the greatest net benefits less cost. Transaction cost theory posits that organizations decide on a specific governance structure based on its ability to economize on the cost of doing business. It has emerged as a predominant economics-based explanation of the choice of internal organizational structures. Not surprisingly, reduced cost has been found to be a major factor in producing positive attitudes towards the adoption of virtual work environment by managers.

Transaction costs can be determined by determining: asset specificity, uncertainty, and frequency of occurrence. *Asset specificity* is the extent to which durable investments are used to support particular transactions. Unspecialized goods or services cost less since they are easily available on the market and redeployable. *Uncertainty* is the extent to which organizations are faced with unforeseen actions; these increase the need for ways to enforce contracts between transactional parties while increasing the need for greater flexibility and speed in coordinating responses to unforeseen problems or opportunities. *Frequency* is the volume of transactions in a given time. Within the context of VO, a good fit between the organizational structure and transaction load should reduce transaction costs.

2.2.2. Institutional theory

This focuses on legitimacy of new organizational structures, regardless of productivity or efficiency. Organizations are subject to external influences that cause them to be similar to others in their environment. Legitimacy allows them to secure resources and support for survival. External influences may include institutional pressures and promotion. Novel organizational structures are more likely to be adopted when they are adopted by other organizations [14].

Institutional pressures arise from three major sources. *Coercive* pressures are exerted by organizations upon whom they are dependent for scarce and important resources. *Mimetic* pressures are those which make an organization imitate others when the organizational technologies are poorly understood, goals are ambiguous, or the environment is uncertain. *Normative* pressures result primarily from professionalization; this is the collective effort of members of an occupation in defining the conditions and methods of work, thus establishing a cognitive base and legitimacy for occupational autonomy.

Support from professional, trade, business, and other organizations may contribute to isomorphism. The effort may involve dissemination of information through communication channels, marketing campaigns, consulting services that share knowledge and experiences, etc. Direct and frequent communications are likely to result in similar thinking and behavior.

Institutional theory could contribute to a better understanding of management's motivations towards virtualization. Environmental factors like technology advancement, growing prominence of e-commerce, and global economy could contribute to more adoption of VOs. For example, it was found that adoption of inter-organizational linkages, critical to the virtualization of B2B firms, could be best explained by institutional pressures [27]. Further, institutional theory models the influence of subjective norm on the adoption of an organizational structure.

2.2.3. Organizational-capability-based theory

The organizational capabilities also play a role in shaping its structure. This theory could provide an alternative, complementary explanation to cost-benefit theory in understanding governance decisions. It argues that the capabilities of an organization define its boundaries and structures. Organizational capabilities behave both as a source of competitive advantage and as a constraint of structural change. This helps explain why seemingly similar activities may be organized differently in different organizations.

Novel structures are adopted when they help the organization utilize its capabilities to realize value. Major capabilities affecting organizational structures include IT [9], trust [18], innovation [8], and risk assessment [2]. It is believed to be a necessary but not sufficient, enabler of structural change within organizations. Trust can be viewed as an organizational resource that influences the extent to which behavioral uncertainty affects organizational design characteristics. Strategic advantages arising from the purposeful pursuit of innovative activities should also be considered in selecting organizational structures. Organizations need to be able to innovate over time. Risk assessment also affects an organization's ability to adopt a new structure. Organizational structure innovations can be rejected simply because the risk assessment of the innovation is too high [25]. VOs, like other innovations, hinge on implementing capabilities accessible to potential adopters. Organizational capabilities needed for VO adoption include IT and trust. Facilitating capabilities emphasized by organizational-capability theory are also important in shaping behavioral control beliefs.

2.2.4. Value of multiple theoretical perspectives

Testing a research model that incorporates economics-based, institutional, and organizational capabilities theories make it possible to determine the relative impact of each factor in influencing the adoption decision.

3. Research model and hypotheses

3.1. Research model

Drawing on TPB and Chwelos et al.'s model, we proposed a research model (see Fig. 1). In this, the adoption intent for virtualizing an organization is assumed to be affected by three major factors: net perceived benefits, external influences, and organizational capabilities.

3.2. Research hypotheses

3.2.1. Net perceived benefits and VO adoption intent

Net perceived benefits are beliefs about the net benefits less cost of the virtualizing organization. They can have a positive influence

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