

## Chapter 2.21

# Classifying B2B Inter–Organizational Systems: A Role Linkage Perspective\*

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### ABSTRACT

This paper aims at developing a framework for business-to-business (B2B) inter-organizational systems (IOSs), based on real-world IOS examples. Based upon two dimensions, role linkage and system support level, we propose a new framework that classifies IOSs into four basic types: (1) resource pooling, (2) operational cooperation, (3) operational coordination, and (4) complementary cooperation. We review select cases that fit into each category and consider the common characteristics of systems in each category. Then we draw implications for IOS planning and suggest a five-step process for creating an IOS plan. It is argued that each category of IOS needs to be linked with a specific business strategy, although each employs a common technical infrastructure.

### INTRODUCTION

An increasingly large number of companies use information technology (IT) for more than operational and management support (Rackoff et al., 1985). In particular, with the rapid advance of telecommunications technology, firms have searched for strategic opportunities from computer networks linking organizations. The information and communications technology that transcends traditional organizational boundaries has been termed inter-organizational systems (Applegate et al., 1996; Cash & Konsynski, 1985; Kumar & Dissel, 1996). Inter-organizational systems (IOSs) function to blur the boundaries of today's organizations as they enable information to flow from one organization to another (Kaufman, 1966; Konsynski, 1993).

The common purpose of traditional IOSs has been to support firms' value chains, so that they can better compete in the market. The IOSs that

have emerged in recent years, however, increasingly support partnering among organizations. That is, there is a shift in the role of IT—from a competition weapon to a cooperation enabler among businesses. It is necessary to view IOSs in a broader context that encompasses not only the traditional value chain but also partnerships and strategic alliances among firms within an industry. This paper addresses the need to incorporate the increasing trend of partnership formation among business firms into a framework for B2B IOSs. The existing frameworks are either too complex to be applied to IOS planning or too outdated with respect to the many forms of emerging global networks.

## RELATED LITERATURE

The IOS research has produced a number of articles that attempted to illuminate numerous aspects of inter-organizational networking, including the inter-organizational relationship, IOS strategic planning (McFarlan et al., 1983), and the IOS network structure (Malone et al., 1987; Marchewka & Towell, 1998).

Barrett and Konsynski classified IOSs on five levels of IOS participation. At Level 1, a firm accesses a system that is run and operated by other companies. Level 2 participants design, develop, maintain, and share a single application, such as a customer order-processing system. Level 3 participants take responsibility for a network which lower-level participants may share. Level 4 participants develop and share a network with diverse applications that may be used by many different types of participants. At Level 5, any number of lower-level participants may be integrated in real time over complex operating environments.

Johnston and Vitale (1988) developed a classification framework using three dimensions: business purpose, relationships with participants, and information function. The framework takes the form of a decision tree, where the three dimen-

sions are sequentially interconnected. Business purpose indicates why an IOS is needed; it could be either to leverage present business or to enter a new information-driven business. Relationships refer to those linked by the system; they could be customers, dealers, suppliers, or competitors. Information function is concerned with functions that the system is intended to perform; it may process boundary transactions, retrieve and analyze shared information, or be internally used. When taken together, these dimensions produce 24 possible combinations ( $= 2 \times 4 \times 3$ ). Thus, this framework suffers from complexity that makes it hard to analyze the characteristics of each category. It also is not so much a framework to classify an IOS as one to study the relationships among its factors.

Kumar and van Dissel present a typology for an IOS based on inter-organizational interdependence. They view an IOS as a technology designed and implemented to simplify the relationships between organizations. Based on three interdependent relationships, including pooled, sequential, and reciprocal interdependencies, their framework comprises information resources, value and supply chains, and networks. The pooled information resource IOSs involve sharing common IT resources. Examples include common databases, communication networks, and applications. These provide economies of scale with consequent cost and risk sharing. The second type, the value- or supply-chain IOS, supports customer-supplier relationships and occurs as a consequence of these relationships along the value or supply chain. These IOSs institutionalize sequential interdependency between organizations. Order-entry and processing systems and CAD-to-CAD IOSs belong to this type. Finally, networked IOSs operationalize and implement reciprocal interdependencies between organizations. They are exemplified by joint marketing programs, where firms exchange information for mutual advantage.

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