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# **Impact of Information Technology on Organizations: The Development of Cooperative Alliances in Industry - Some Research Issues**

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## **Introduction**

Innovations in information and telecommunication technologies (ITT) are rapidly changing organizations and the traditional market places where they compete (Zwass, 1996). Organizations are creating thinner, flatter, and cross-functionally integrated structures with higher productivity and shorter cycle times through the use of information technology. Organizations are also using information technology as a strategic tool to enhance their productivity and competitive position in the market place through its contributions in improving the marketing strategy elements: product, price, promotion, and placement (distribution). ITT innovations, which include worldwide web, Internet, electronic data interchange (EDI), and wide area networks (WANs), are also creating new opportunities for business-to-consumer and business-to-business electronic commerce. New forms of interorganizational systems and supply chains are also emerging.

In a traditional market place, firms compete to enhance their market share and profits. The strategic use of information technology in enhancing competitive position is well documented in the literature. In recent times a new form of cooperation among firms has emerged. This cooperation is centered around and triggered by advances in information technology. Cooperation among non-competing firms along a supply chain is an important example of such development. There are clear advantages for non-competing firms along a supply chain to form cooperative relationships to help improve performance on inventory and response time, and to reduce transaction costs. Such relationships are generally between a supplier and a customer.

In an interesting new development, competing suppliers are also forming alliances to create industry wide networks, support structures, and standards to provide efficient, responsive service to customers. This is in contrast to the traditionally competitive use of information technology by firms. The development of cooperative alliances has important implications for the health and the profitability of companies. Such alliances may result in lower inventory levels, better coordination and planning, and reduced transaction costs. Thus the impact may be beneficial for an entire industry as well as for its customers. Such alliances have spanned different industries that include grocery, shipping, retailing, banking, telecommunications and entertainment, health care providers, health insurance industry, and even local governments.

The regulatory role of the government has traditionally been viewed as fostering competition and discouraging cooperation among competitors. However, government may have an important facilitatory role in helping create such cooperative structures that may benefit various industries and ultimately the whole economy.

The objective of this paper is to study the cooperative alliances amongst firms as an outcome of the rapid proliferation of information and telecommunication technologies. This research will explore the issues in the formation of cooperative alliances and the outcome of such alliances. A number of articles in the business press have reported the unique nature of these co-operative alliances between vendors within many service industries. Nearly all of the cooperative alliances reported thus far in the press involve an industry wide effort to utilize the power of the new ITT to deliver products and services to customers and the society more efficiently. However, academic attempts to study these alliances have not been forthcoming. This paper should help address this gap. The next section presents examples of cooperative

alliances in various industries. The following sections present research questions to be addressed by this proposal, methodology, and importance of the research.

### **Cooperating at the Industry Level while Competing at the Firm Level**

As mentioned earlier, a number of firms in different industries have now come together to harness the emerging information technologies for improving industry wide performance. Some examples of cooperative alliances and benefits to customers and the society are discussed here. Well before the current heated debate on health care reforms, companies like Mutual of Omaha in the insurance industry were working on reforms that would provide lifetime coverage, eliminate fraud, and control waste in the system (Thomas and Herr, 1994). Their plan was to build cooperative alliances to usher in an age of paper less administrative system through the use of new information technologies. The result could be a virtual corporation i.e., a network of companies strategically aligned to develop and market a product, wherein companies link up via information systems and contractual relationships, instead of common ownership or control (Pallarito, 1996).

In the banking industry, ATM networks are amongst the best examples of what cooperative alliances can do to benefit customers, banks, and trade and commerce in general. The cooperative alliance between the bankers has now provided the consumers the power to get cash anywhere any time by building an international web of networked computers and advanced telecommunication technologies (Burger 1995).

One of the most recent information systems revolutions is in the grocery industry. Developments in shared information systems and integrated logistics systems through the cooperative efforts of the Independent Grocers Association (IGA) have resulted in significant benefits to all the parties involved. The IGA which is an affiliation of 3600 autonomous supermarkets is installing client/server systems to introduce what is known as the Efficient Consumer Response system (Greenbaum, 1995; Narayanan, 1996). The ECR is a strategy in which retailers and manufacturers work closely together to bring better value to the customers by cutting through tradition and physical assets in the supply chain can be reduced (Byrne, 1997). The expected result is that operating costs in the supply chain could fall by \$27 billion dollars and inventories could drop by over 40%. This could translate into savings equivalent to a 5.7% reduction in consumer prices, worth over \$33 billion dollars.

Another system being explored is by the Utilities Industry. In a cooperative alliance, the officers of the US' Investor-Owned Utilities plan to chart out how they can harness the powers of the new information technology. In an industry that is characterized by regional monopolies, not necessarily known for their efficiency, these utilities plan to come together to cooperate in delivering a better value to society (Yeager, 1990). Global alliances in international marine shipping lines are now shaving days off transit times, which means shippers could save considerably by switching from air delivery to expedited ocean delivery (Davies, 1996). Information systems associated with intermodal transportation are expected to produce as dramatic a breakthrough as when containerization was introduced.

Other alliances involving municipal governments, the digital pay TV industry in Europe, and the retailing and transportation industries have also been noted in the press. Thus ITT innovations have fostered the growth of several new cooperative alliances in the economy.

### **Research Issues**

There are many research issues and questions that need to be addressed in studying IT based cooperative alliances within the domain of electronic commerce. This paper will focus on the following:

1. Development of a conceptual framework to help explain the formation and proliferation of IT based cooperative alliances. An initial framework to examine the process of alliance formation is developed in figure 1. We view the IT based alliance formation process in three stages. First, we consider the variety of

possible antecedent conditions that favor alliance formation. In the second stage, we focus on issues in the process of alliance formation and finally examine the benefits of the alliance.

Such a structure to examine IT based alliances is similar to the existing literature that looks at the formation, maintenance and dissolution of interfirm cooperative alliances (i.e. Strategic Alliances) (Pharke 1993). To the extent that we will be looking at voluntary inter firm arrangements between otherwise competitive firms within the industry, the arrangements are subject to the typical instability that arises from self-governance (Telser, 1980), and the lingering presence of the self-interest orientation (Williamson, 1985) amongst parties to the alliance. Thus, an important question that needs to be answered is whether the antecedent conditions are overwhelming enough to help the partners tide over the uncertainty involved in mutual co-operation.

In examining the antecedent factors that help create IT based alliance, we examine the power of several motives. For instance, a powerful motive for firms to form a cooperative alliance is in the creation of a new market for the industry as a whole. Brandenberger and Nalebuff (1995) have suggested that cooperative alliances work well when developing a new market that is prohibitively expensive and risky for a single firm to develop. They suggest that creating a new pie or a new market is a legitimate reason for the creation of a cooperative alliance.

In the second stage we seek to study the process of alliance formation. In other words we seek to examine the structuring of the alliance and proceed to examine the nature of the working relationships from a perspective grounded in the traditional cooperative game theory. Pharke (1993) and Kogut, (1989) are amongst the many researchers who have modelled such cooperative alliances using the standard prisoners dilemma game. We apply their model to seek to uncover the reasons that foster the success of IT based alliances and why they are able to ride over the prisoners dilemma.

To enrich this framework, we will also consider perspectives borrowed from equity theory, which suggest that cooperation would succeed as long as the participants perceive the benefits to be fairly distributed. While participants may seek explicit benefits, they may also want to avoid undesirable consequences such as being put in a competitive disadvantage via-a-vis other members of the alliance.

In the final stage, we evaluate the gains from the cooperative venture and the extent of such gains for different participants. We also study any positive or negative externalities that arise from such relationships.

2. Identifying guidelines for a regulatory framework to foster and control IT based cooperative alliances. Cooperative alliances need to be encouraged, yet at the same time such alliances could offer opportunities for price setting and other forms of cooperation that inhibit competition.

## **Research Plan**

1. In depth study of an industry to examine an IT based alliance, its formation process and the resulting benefits to help validate and refine the framework. 2. Using the case study to identify and empirically study the benefits of such IT based cooperative alliances amongst suppliers in different industries in terms of better planning and coordination, reduced cycle time, lower inventory and transaction costs, and other savings.

As a first step the paper will focus on the case study approach. Literature review and analytical methodology will be employed. Interviews will be conducted with five executives whose firms have participated in the formation of cooperative alliances to gain analytical insights.

## **Conclusion: Importance of Research**

ITT innovations have paved the path for the formation of cooperative alliances in a number of industries. Such alliances can benefit firms, their customers, and potentially the society at large. These developments are a part of the growing electronic commerce, which will ultimately play a dominant role in the domestic and World trade. It is important to understand this phenomena; help develop suitable policies and structural guidelines to foster advances; and to direct its evolution to the benefit of all participants.

(References available upon request)

***Figure 1: An initial framework for understanding cooperative alliances***

