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The Impact of Inter-Organizational Systems

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The Impact of Inter-Organizational Systems

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Introduction

Application of information technology to facilitate information flows associated with coordinating transactions between two are more organizations are commonly known as inter-organizational systems (IOS). Such systems, on one hand allow for smoother and cheaper linkage between two organizations by the transactions to take place more efficiently thus lowering the over all cost of transacting. On the other hand, they allow for the initiating firm to achieve an edge over its competition. Such a competitive edge (by the initiating) firm is achieved in a two-fold way: (i) by introducing systems which require large capital investment, the entry barrier is raised thereby decreasing threat of new entries and (ii) by forcing the other party (buyers or suppliers) to invest into specialized assets like hardware, software, and skills (which of course are eventually paid back by the reduced cost of transacting), thereby increasing the cost of switching. In some cases the benefits of an IOS were deemed by the initiator firm to be so significant that it provided the other party with the necessary equipment at a no cost. Because of their ability to provide the first-mover advantage, IOS have been labeled as "strategic systems." Recently, large retailers have used IOS to implement Vendor Managed Inventory systems where even the demand analysis and forecasting decisions are delegated to the suppliers. Since the supplier has immediate access to the demand data it can adjust its production level more quickly in response to fluctuations in the demand. Many other retailers and consumer good producers have responded to the competitive threat posed by large retailers like Wal-Mart by developing joint warehousing systems, which are commonly known by Efficient Consumer Response systems, thereby providing benefits of virtual integration without individual firms loosing their identities.

While in many cases, the focus of IOS has been dyadic relationship between buyers and sellers [GASK85, ZAHE94], for some industries, the entire value chain involving many different players have been transformed. In distribution channels (or just channels in the sequel) products flow through many different stages before (and in some cases even after) getting committed to a customer. Since channel members perform interrelated activities, the organizational effects of an IOS are not confined to just the immediate trading partners linked by the system. Rather, resulting changes percolate throughout the channel.

Problem Statement And Significance

In this work we study the impact of IOS on the structure of the distribution channels. We use a political economy framework suggested by Stern and Reve [STER80] to develop a model and motivate propositions as to the effect of IOS on channel structure. Our main research hypothesis is that

H0:

> At the current levels of IT maturity in distribution channels, new IOS cannot be treated as strategic systems; rather these systems are defensive in nature.

Defining the appropriate impact of the IOS has considerable significance. If IOS are deemed to be strategic in nature, the right initiation policy would be a proactive one (i.e., acquire the system as quickly as possible) and right acquisition policy would be to custom built the system. If IOS are deemed to be defensive in nature, the right initiation policy would be a reactive one (i.e., to postpone acquiring the systems till at least one competitor has already started investing in it) and the right to purchase the system from an outside vendor.

Channel Descriptors

Producers use external agents, called channel members in marketing literature, to move products to the final consumers. As Bucklin points out, such intermediaries add value to the economy by performing channel functions like (a) providing spatial convenience, (b) packaging and repackaging (c) reducing waiting time, and (d) providing product assortment [BUCK65, GASK85]. For example, consumers who want to purchase in small lots depend on channel members for providing sorting functions. Similarly, consumers who face high costs of waiting depend on channel members who can satisfy the demand from inventory. Borrowing marketing literature, we use the following terms to describe channels:

Channel length:

> Short channels indicate integration of several channel functions by some channel members such as the producer or a large wholesalers. Long channels indicate that channel functions are spun off to intermediaries because the market demands greater specialization.

Power distribution and relative location of channel captain :

> Long channels often see conflicts among channel members because of their natural tendencies to protect their own interests. In vertical channel relations conflicts take form of attempts to set channel prices, shift risks associated with excess inventory and stockout's to others, and quality debasement. In horizontal relations, conflicts take form of territorial encroachment, free-ridership in

promotion etc. The channel captain is the member who has power to resolve conflict between channel members and to influence the decision variables in the marketing strategy of another member at a different level in the channel. When channel captains are located close to the consumers the market is better able to control production.

Degree of formalization:

When the channel relations, including recurrent exchanges, are governed by uniform standards so that the information in coordination of channel activities as well as resolving channel conflicts are easily defined and observable, the channel has a high degree of formalization. When the relations are governed on an ad hoc basis or in a bilateral manner, the channel has low degree of formalization.

External Diversity:

External diversity refers to the competition faced by a channel member. Thus a typical convenience store faces high degree of diversity where as an aircraft leasing agency would have low external diversity

Internal diversity:

Internal diversity refers to the assortment of products to be handled by a channel member. For consumer goods, the assortment of goods handled by a retailer tend to be large, while many durable goods are sold through exclusive dealerships, the assortment handled by a dealer is limited to products only from one manufacturer.

Current study

We use a political economy framework suggested by Stern and Reve [STER80] to develop a model and motivate propositions as to the effect of introduction and adoption of IOS on channel. The framework borrows from both the transactions cost analysis (See for example Williamson, [WILL86] or Malone et al. [MALO87]) and sociopolitical (see for example Gaski, [GASK85]) approaches to describe channel structure in terms of efficiency of the channel and power exerted by the channel members on each other in a dyadic relationships. We propose to generalize the framework to describe channel structure is in terms of the channel length and the location of the channel captain. Our analysis starts with identifying the information flows associated with channel functions which can be broadly grouped into two categories: (i) logistics information which is information needed to coordinate physical flows; and (ii) demand information which is used to make the procurement decisions at different levels in the channel. The model further accounts for the effects of diversity, both internal and external . Using the characterization of channels given above we arrive at the following propositions which identify changes in the channel as IOS get adopted

H1: IOS lead to higher degree of centralization (by making private knowledge into public information which can be effectively used by a centralized authority)

H2: IOS leads to shorter channels.

H3: The location of channel captain moves toward consumers.

H4: The risk associated with demand and product uncertainties are increasingly borne by the producers rather than downstream channel members.

H5: IOS lead to a higher degree of formalization.

If found to be valid, H1-H4 would tend to suggest that it is more likely that the downstream channel members find the IOS strategic while the upstream members are more likely to find them tactical. H5 just suggests that the overall costs of transacting reduces because the information relevant to a transaction is easily available to all parties.

H6: IOS which require specialized resources to implement, shift location of the captain towards the initiator.

H7 When IOS are introduced by a channel captain, the channel captain may further consolidate its power.

H8: Introduction of IOS which support very specialized channel functions (e.g. flow of crude through pipelines), the location of channel captain does not get effected.

H9: When an IOS is introduced to replace an existing one, there are insignificant shifts in the power

If found to be valid, H6-H8 identify situations where IOS would indeed have a strategic focus while H9 suggest that one the first-mover advantage has been achieved, IOS loose their strategic impact.

Top level information systems executives from businesses in distribution and wholesaling industry will be surveyed on their perception on the strategic role of IOS. The propositions above would help generate statements for which agreement could be measured on a standard Likert type scale. The survey results will be analyzed using the Structural Equation Modeling (BAGO82) approach to analyze the data. The SEM approach allows us to account for latent variables that do not manifest themselves explicitly. For example, the construct of external diversity can be inferred from several explicit measurements such as the number of direct competitors, the intensity of competition and the distance from the competitors.

We are also developing models which can provide useful insights into vertical channel relations. Currently we are examining the effect of IOS on channel coordination for the stylized case of single producer and multiple retailers.

Centralized and decentralized market scenarios have been considered to study the differences in the effects of IOS implementation. IOS can lead to shifts in current allocation of costs and profits among channel members. Therefore the much touted benefits of virtual integration can only be achieved if we have a framework to provide answers to managers on what incentives are needed for the implementation of such systems.

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