Business Dancing Vs Business Marriages: 
Metaphors In Interfirm Relations

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ABSTRACT

The subject of metaphors has occupied the minds of IMP researchers at previous conferences (Easton 1991). This paper focuses on a metaphor that is commonly used to describe aspects of interfirm relationships, which is obviously central to the interests of IMP researchers. This is the marriage metaphor. In this paper we propose an alternative metaphor based on dancing which we believe is capable of capturing more of the essential substance and diversity of interfirm relations in business. We use some of the results of our Interfirm Relations Research Program to illustrate the diversity of types of interfirm relations and the way they evolve. We then propose a classification scheme based on the empirically observed variations revealed in the IRRP data base and use the dance metaphor to encapsulate the main features of each type of relation.
Electronic Communications: The Binding And Severing Force in Buyer-Seller Company Interaction

Introduction

The effective coordination and maintenance of interorganizational exchange relationships in channels is of extreme importance to business practitioners. The environment in which businesses operate has become extremely competitive. As a means of competing, organizations are becoming strategically focused. Long-term strategic relationships are replacing the short-term transactional type relationship of the past.

The current research investigated the role electronic communications, Electronic Data Interchange (EDI), played in the formation of long-term strategic relationships. Is it the glue that ties long term relationships together? If so, then is it a severing force when one partner refuses to adopt the technology?

The research surveyed 540 respondents in order to understand EDI's role in strategic partnership formation. Specifically what is the adoption behavior of firms within and between channels using EDI. Is EDI adopted to form a long-term relationship or is it adopted to sever relationships?

Electronic Data Interchange (EDI) is the "interorganizational exchange of business documentation in a structured machine-processable form" (Emmelhainz 1990 p.4) By its very definition it is interorganizational. Thus, studying its adoption requires an interorganizational or channel perspective. Two types of channels identified by Bowersox, Closs and Helfrich were investigated in the present study. The transaction, or marketing, channel which focuses on negotiating long term relationships between buyers and sellers, was
represented by sampling customers and suppliers in the channel. The logistical channel, which coordinates and manages the actual flow of products, was represented by sampling shippers and carriers in the channel. EDI adoption within both channel types is investigated because our understanding the role EDI plays in forming strategic relationships is rather limited. For a graphical depiction of the two channel types see Figure 1.

Research Purpose

The purpose of this research is to contribute to our understanding of adoption behavior between and within channels types through the testing of theoretically founded and practitioner supported variables. The theoretical variables found in the literature were selected because of their ability to determine technology adoption within organizations. Since the objective of this study is to expand our knowledge of adoption in logistical and marketing channels these same theoretical variables were tested to determine their predictive power in channel adoption.

Prior research from organizational behavior, economics, marketing and logistics is integrated to develop a framework of interorganizational EDI adoption. Organizational behavior theory has suggested that organizational factors such as organizational size and centralized organizational structure positively influence the adoption of technological innovations. Economic theory and marketing researchers have indicated that adoption is not only influenced by internal factors but by the organization’s external environment as well. The extension of adoption from a single organization to the channel requires the inclusion of
channel power. Significant contributions about power have been made by both marketing and logistics disciplines. The use of power in the channel is expected to significantly impact EDI adoption. Thus, the model depicted in Figure 2 is not only an integration of theories and research but an extension of the adopting unit from the single organization to the distribution channel. The next section provides theoretical support for the model and development of testable hypotheses.

Framework of Interorganizational EDI Adoption

**Internal/Organizational Dimension**

Researchers have argued that the structural characteristics of an organization significantly influence its adoption behavior. The contention is that certain features of organizations facilitate or encourage adoption of an innovation. This research investigated two organizational variables, organizational size and organizational structure, in relation to interorganizational EDI adoption.

**Organizational Size**

There have been numerous empirical findings which document a positive relationship between size and adoption behavior. Researchers have found that organizations do not adopt technologies because of their pure size, but because size leads to economies of scale, capital accumulation and/or volume of transmissions. Larger organizations process a sufficient volume of transactions and have substantial capital to justify the adoption of a new technology, such as electronic data
interchange (EDI). Smaller organizations, however, with fewer transactions and less capital availability might not reasonably expect to benefit from adopting similar innovations. The null form of the organizational size hypothesis for both channel types is presented below.

Hypothesis A1:

The relative size of channel members in the marketing or logistical channel will not significantly explain the variance of EDI adoption within the marketing channel.

Organizational Structure

Nearly all researchers hold that organizational structure is important to innovation adoption. The relationship between centralization and adoption of innovation has been found to be positive in some cases and negative in others. Rarely, if ever, has it been found to have no impact. The position taken in this research resembled that taken by Robertson and Gatignon. The researchers propose that centralization facilitates acceptance of innovation for technologies requiring organizational standardization (e.g., telephone systems and EDI). Since EDI implementation requires an organization to standardize their business transactions in an electronic format to be transmitted to a channel member, top management’s support and approval is often required.

Thus, a centralized decision making structure is expected to facilitate the interorganizational adoption of EDI faster and more efficiently than a decentralized decision making structure because senior managers can adopt EDI despite the resistance of lower managers. A decentralized structure is expected to slow the interorganizational adoption of EDI as the adoption decision ascends through the levels of management because lower managers do not have the same power and influence.
over upper managers. The null organizational structure hypotheses are listed below for both channel types.

**Hypothesis A2:**

The organizational structure of channel members within marketing or logistical channels will not significantly explain the variance of EDI adoption within marketing channels.

**External/Industry Dimension**

While a significant body of research exists that has contributed to our understanding of the impact environmental conditions have on the distribution channel, our understanding of how they influence the adoption of technology has been under explored. This research investigates the influence environmental variables, industry competitiveness and demand uncertainty, have on EDI adoption.

**Industry Competitiveness**

The structural characteristics of the industry are important to the adoption of a technological innovation. However, economists have disagreed about the environmental condition most conducive to technology adoption. There often arises a conflict between the true monopoly and pure competition. Both theoretical and empirical studies have suggested the existence of a degree of concentration which lies between pure monopoly and atomistic (perfect) competition that is best for organizational adoption performance.

The acceptance of a technological innovation is posited to be maximized in more concentrated industries. The logic is that industry participants operating under oligopoly conditions pay close attention to
each others' competitive moves and that the benefits of adopting an innovation increase as the number of competitors decreases\textsuperscript{19}. The participants also are more likely to have the discretionary financial resources necessary to innovate than those in industries characterized by numerous firms with small market share.

Industry competitiveness (e.g., concentration of competition in the industry) was expected to have a significant impact on the adoption of interorganizational EDI within distribution channels. Under high competitive intensity, greater resource allocations and more aggressive pricing policies are likely to materialize, thus encouraging more rapid diffusion\textsuperscript{20}. Robertson and Gatignon hypothesize that high levels of competitive intensity lead to more rapid diffusion and the achievement of higher levels of market penetration for the innovation. Presented below are the null hypotheses for industry competitiveness.

Hypothesis B1:

Industry competitiveness will not significantly explain the variance in EDI adoption within marketing or logistical channels.

Demand Uncertainty

A turbulent market environment created by fragmented markets with less brand loyal customers, coupled with intense global competition and rapid product innovations highlight the need for incorporating the element of demand uncertainty in the framework.

It has long been viewed that occurrences in the channel's external environment affect the degree of uncertainty experienced by channel members\textsuperscript{22}. Uncertainty is a pivotal notion in organization behavior theory. Thompson\textsuperscript{22} views it as the "cutting edge" of organizational
analysis and sees coping with uncertainty as the "essence of the administrative process".

Pierce and Delbecq hypothesize that "environment uncertainty will be positively related with organizational innovation (i.e., initiation, adoption and implementation)." Based on data from five in-depth case studies of the adoption of innovations in five shoe firms, Duchesneau et al. found that to reduce uncertainty firms are "more likely to adopt new innovations." The research hypotheses are:

Hypothesis B2

Demand uncertainty will not significantly explain the adoption of EDI within marketing or logistical channels.

Interorganizational Dimension

Channel Power

Among the phenomena that occur in distribution channels, probably none has gained the attention of researchers as much as interorganizational power. The degree of scholarly interest in this topic may come from power's significance and utility in the real world of distribution, as well as its potential as an explanatory construct in the realm of scientific understanding.

Power is defined as the influence one channel member has over another channel member. According to Emerson (1962), power is a relational concept inherent in the channel. In other words, there will always be some power existing within distribution channels due to mutual dependencies which exist among channel members, even though that power may be very low. However, power can also be fully concentrated in a single organization which then appears as the undisputed channel administrator.
Channels with an undisputed channel administrator are described as having a unilateral power system. Because of the numerous flows which tie the channel together, the more common case is where different firms exercise control over different flows, functions or activities. The latter can be referred to as a mixed power system.

The power construct was thought to be more influential when there is a unilateral power structure. Literature suggests that channels with unilateral power structures will adopt EDI because the more powerful member will "push" EDI on the less powerful member. Therefore, the research hypotheses stated in the null are presented below.

Hypothesis C1:
Channel power will not significantly explain the variance of EDI adoption within marketing or logistical channels.

Research Methodology

The research was conducted in two phases. The first phase of the research utilized interviews from firms that represented organizations from both channel types. In addition, consultants and EDI third party providers were included to provide an impartial and unbiased perception of EDI adoption within both channels. Phase one was conducted to determine if there was practitioner confirmation of the study's theoretical variables and to investigate whether there were other variables practitioners thought influenced adoption. The findings from phase one were included in phase two of the methodology.
The second phase collected data through a national mail questionnaire. Questionnaires were mailed to customers and suppliers in the marketing channel and shippers and carriers in the logistical channel. A combined of 540 questionnaires were mailed and 156 usable questionnaires (28.9% response rate) were returned.

Selected sections of the Customer and Supplier Questionnaires were designed so that supplier responses could be directly compared with customer responses. Likewise sections of the Shipper and Carrier Questionnaires were constructed so that shipper and carrier responses could be directly compared.

Questionnaire Design

The questionnaire consisted of a series of interval scales. Seven point semantic differential style scales with bipolar descriptors and 7 point Likert scales anchored with "strongly disagree" and "strongly agree" were used to gather data.

Each construct of interest—organizational size, organizational structure, industry competitiveness, demand uncertainty and channel power—had multiple operationalizations. Each variable suggested by practitioners in phase one was assessed through single measures.

Respondent Sampling

The customer, shipper and supplier sample from phase II represented a convenience and judgment sample taken from the membership list of the Council of Logistics Management (CLM). The carrier sample was obtained from both the CLM membership roster and the 1992 Second Annual Mason
Symposium attendee list. After duplication of firms was eliminated by subjectively selecting the most appropriate title for the respondent, and after firms not classified as shippers, carriers, suppliers or customers were deleted, the questionnaires were mailed to the remaining 540 members. Of the 540 questionnaires mailed, 162 were returned resulting in a 28.9% response rate.

Data Analysis

Several data analyses techniques were performed on the data. Since non-response bias is inherent in all survey research that does not have 100% compliance, a test for non-response bias was performed. The data was then analyzed using Cronbach’s alpha to assess internal consistency and reliability. Items with reasonable Cronbach alphas were an indication that the items were consistent and reliable in measuring the research variables. Third, the reliable measures were further analyzed using principal component factor analysis to determine the number of factors present in the data. To interpret the factors, test for validity and calculate composite factor scores, factor analysis with varimax rotation was performed. Variables that demonstrated reasonable reliability and validity were used to develop regression models. The regression models were used to test the research hypotheses.

Non-Response Bias

The test for non-response bias required contacting non-respondents. The test then compared responses from the non-respondents to those from questionnaire respondents on eight key questions.
There were no statistically significant differences at the .05 level. Therefore, it was inferred that the results could be generalized to the target population.

**Cronbach Alpha**

The Cronbach alpha was used to test internal consistency of questionnaire responses, and to provide information about similarity in measurement across items. It was an appropriate test for inter-item consistency because the item measures were scored on a scale ranging from one to seven.

**Factor Analysis**

Scree plots and the eigenvalue greater than one criterion were used to determine the number of factors in each data set. Nine factors were retained for the supplier and shipper data sets and eight for the customer and carrier data sets. The factors were rotated using varimax rotation to investigate whether a simple interpretable structure existed.

**Regression Model Development**

The Forward Stepwise regression technique was used to develop regression models. The Forward Stepwise regression technique inserts variables into a regression model until a satisfactory regression equation is reached. The order of insertion is determined based upon the partial coefficient. The partial coefficient determines the importance of variables not yet in the equation. The results of the Forward Stepwise regression technique are discussed below.
Marketing Channel Regression Models

Performing Stepwise regression on all measures, both theoretically founded and interview supported, resulted in the following regression models. The supplier and customer multiple regression models were significant at the .05 level.

**Suppliers Multiple Regression Model**

\[
Y_i = 14.29 + 1.63X_1 + 12.5X_2 \tag{1}
\]

\[ P < F = .0070 \quad R^2 = .26 \quad n = 35 \]

\( Y_i \) = Percentage of customers with whom suppliers share information via EDI

14.29 = Intercept

\( X_1 \) = Composite Score of Supplier Size

\( X_2 \) = Individual Measure of Demand Uncertainty

Using a 2-tailed test, the Betas were significant at the .05 level. The supplier size composite score increases adoption by 1.63 if the value for demand uncertainty is held constant. Likewise, if the value for supplier size is held constant the percentage of EDI adoption increases by 12.5.

**Customer Regression Model**

\[
Y_i = 51.88 + 12.26X_1 \tag{2}
\]

\[ P < F = .05 \quad R^2 = .19 \quad n = 40 \]

\( Y_i \) = Percentage of customers with whom buyers share information via EDI.

51.88 = Intercept

\( X_1 \) = Individual Measure of Demand Uncertainty
Using a 2-tailed test, the Beta was found significant at the .05 level. The beta for $X_i$ increases the percentage of adoption by 12.26 for every unit increase in the measure of demand uncertainty.

**Logistical Channel Regression Models**

The following shipper and carrier models were obtained from the Stepwise regression technique. Both models were significant at the .05 level.

**Shipper Regression Model**

\[
Y_i = 42.56 + 12.11X_i \tag{3}
\]

\[P < F = .0459 \quad R^2 = .22 \quad n = 32\]

$Y_i =$ Percentage of customers with whom shippers share information via EDI

42.56 = Intercept

$X_i =$ Individual Channel Power Measure

Using a 2-tailed test, the Beta was found significant at the .05 level. The beta for $X_i$ increases the percentage of adoption by 12.26 for every unit increase in the measure of channel power.

**Carrier Regression Model**

\[
Y_i = 59.6 + 6.77X_i - 14.4X_i^2 \tag{4}
\]

\[P < F = .013 \quad R^2 = .29 \quad n = 27\]

$Y_i =$ Percentage of customers with whom suppliers share information via EDI.

59.6 = Intercept

6.77$X_i$ = Individual Measure of Industry Competitiveness

-14.4$X_i$ = Individual Measure of Channel Power
A 2-tailed test was used to test the significance of the Betas. Both betas were found to be significant at the .05 level. The measure of industry competitiveness increases adoption by 6.77 if the value for channel power is held constant. According to the sign on the Beta, as carriers lose power in the channel, the adoption percentage increases by 14.4, if industry competitiveness is held constant.

Within Channel Research Findings

Marketing Channel

Suppliers within the marketing channel are characterized as having large organizational size and high levels of demand uncertainty. The sign on the beta suggests that large suppliers perceive themselves as operating within highly uncertain markets. According to prior research, demand uncertainty in the environment may drive them to adopt EDI; but its the firm's size (i.e., profitability) that actually makes adoption possible. Thus, when financially feasible, uncertainty in the marketplace influences firms to adopt EDI to bind together in a long-term relationship. Thereby binding the channel partnership together for future business.

Another characteristic of the marketing channel is customers' perception of high levels of demand uncertainty. The findings suggest that customers may adopt EDI because of its ability to reduce demand uncertainty in the environment. EDI enables both suppliers and customers to reduce demand uncertainty because the channel becomes electronically tied. Each member is able to look into its partners production schedule, inventory levels, and freight tracking systems. This immediate access reduces time and uncertainty while conceptually binding the channel
closer together.

Logistical channel

Based on the responses by both shippers and carriers there appears to be a different set of factors which characterize the logistics channel. It appears that shippers not only have unilateral power but exercise it by giving carriers mandates to adopt EDI. Those choosing not to adhere to the request will either pay surcharges on every paper document or suffer complete loss of the shipper’s business. Therefore suggesting that the lack of EDI adoption can sever a channel relationship.

The findings also suggest that sometimes carriers adopt EDI for more proactive reasons. As discussed above, carriers reacting to shippers requests are often "forced" to adopt EDI in order to continue in a business relationship. However, some carriers as a means of competing in a highly competitive environment will proactively adopt EDI. EDI enables them to differentiate their service offerings from the competition.

Between Channel Differences

The research findings suggest that marketing channels are typically characterized by suppliers and customers that use EDI to bind the channel partners together as a means of reducing environmental uncertainties. Logistical channels that adopt EDI are characterized as having significantly powerful shippers which forcefully persuade carriers to become EDI-ready. Thus, lack of EDI adoption by carriers may actually sever the shipper-carrier relationship.
Summary

In sum, the adoption of EDI appears to bind the marketing channel relationship together as a means for decreasing environmental uncertainty. However, it can be a severing force in the logistical channel. Carriers not adopting EDI may be severed from future business with shippers.
Notes


10. Same reference as Note 7.
11 Same reference as Note 6.

12 Dwyer, Robert and Ann Welsh. "Environmental Relationships of the Internal Political Economy of Marketing Channels." *Journal of Marketing Research* 12 (November 1985);

13 Same as Reference Note 6.


19 See reference Note 18.

20 See reference Note 6.

21 Achrol, Ravi and Louis Stern. "Environmental Determinants of Decision-Making Uncertainty in Marketing Channels." *Journal of Marketing Research* 25 (February 1988);


26 See reference Note 25 p. 118.

27 Gaski, John. "The Theory of Power and Conflict in Channels of


33 See reference Note 31.


36 See reference Note 5.
FIGURE 1

GRAPHICAL DEPICTION OF CHANNEL TYPES

Marketing Channel

- Customer
- Supplier

Logistical Channel

- Carrier
- Shipper
FIGURE 2
FRAMEWORK OF INTERORGANIZATIONAL EDI ADOPTION

Internal/Organizational
- Organizational size
- Organizational Structure

External/Environmental
- Industry Competitiveness
- Demand Uncertainty

Interorganizational
- Channel Power

Marketing Channel
- Supplier → Customer

Logistical Channel
- Shipper ← Carrier