EDI Adoption and Implementation: A Focus on Interorganizational Linkages

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This paper explores the role of interorganizational distributions of power in EDI adoption. It reports findings of a vendor survey of a Fortune 1000 company that wants to adopt EDI. As hypothesized, perceived costs are negatively and significantly related to EDI adoption. However, perceived benefits, trust in trading partners, and net dependency do not significantly affect the intent to adopt EDI. Implications of the findings are discussed.

The use of information technology -- such as American Hospital Supply’s ASAP and American Airline’s Sabre system -- to gain competitive advantage has heightened interest in technologies that link organizations. EDI (Electronic Data Interchange) is one of these technologies. It is experiencing steady growth. There are currently an estimated 10,000 corporate users, and annual growth is anticipated at 40 percent for the next five years. Thus, there may be as many as 75,000 corporate EDI users by the end of 1995 (Dreyer, 1989). From sales of $200 million in 1988, the EDI market is expected to jump to $1.9 billion by 1992 (Seither, 1988; TDCC:EDIA Conference, 1989).

EDI allows buyers and sellers to transmit standard business documents, such as purchase orders and invoices, directly from one company’s computer to the computer of another company. EDI has the potential to reduce order turnaround time, minimize human intervention errors, limit inventory levels, and increase productivity, customer service, and cash flows. However, while EDI clearly provides benefits, it may be costly to implement if a company does not have the appropriate hardware or software. Security becomes an important issue as controls associated with paper flows become inoperable. Further, benefits derived from EDI may be limited if information systems are not substantially modified to integrate EDI into organizational processing. They may also be limited if high-volume trading partners do
not participate.

Because multiple organizations must participate, the adoption process for EDI technology provides a unique opportunity to study interorganizational power. Unlike the procedure for implementing many other technologies, the decision to adopt EDI is not exclusively individual or organizational. For its benefits to be realized, multiple organizations must accept and implement it. Power may play a role in establishing the interorganizational linkages. In a recent study by Link Resources Corp., 40% of the surveyed EDI users indicated that the impetus to install EDI came from customers. Moreover, 15% of the users installed EDI only because they felt they had to (Keefe, 1988). Sixty-nine percent of the respondents in a survey by Kavan and VanOver (1990) reported their customers mandated the use of EDI as a condition for future business. Improving, or at least sustaining, relationships with customers was their dominant motivation for EDI adoption. Thus, EDI offers the opportunity to study how far a company can apply its power to persuade a trading partner to adopt a new technology.

The purpose of this paper is to explore the extent to which interorganizational power, as well as EDI benefits and costs, influences the decision to adopt EDI. Two critical types of interorganizational power are incorporated into a model of EDI adoption. Hypotheses derived from the model are tested in a study described in the second major section. Study results are reported in the third major section, and implications of the findings are addressed in the last section.

Interorganizational Power

Frequently, power studies have focused on two types of power: potential and enacted (Provan, 1980). Potential power “is the capacity of one social actor to influence another” (Provan, 1980, pp. 550). It has been studied using subjective measures of perceptions of power and objective measures of formal position and net dependence. Net dependence is an approach to measuring potential power in a two-party relationship: A is said to have power over B to the extent that B is dependent on A (Blau, 1964; Emerson, 1972). In the net dependence approach, the weaker party’s actions are influenced by the assumption that the stronger party can and will control its rewards and sanctions. This approach has been used in studies of agency power exerted by United Way organizations (Pfeffer & Leong, 1977; Provan, Beyer & Krytbosch, 1980) and in a study of the power-dependence relationship between farm and power equipment dealers and their primary suppliers (Provan & Skinner, 1989). Oliver (1990), Wey and Gibson (1991), Meier and Chismar (1991), and Cheng and Bozeman (1990) suggest that interorganizational relationships may be prompted by the potential to exercise power or control over another organization.

Clearly, an organization may possess potential power without actually using it. It thus becomes important to consider enacted power as well. With enacted power, the power holder must make an explicit attempt to influence behavior. In this approach, specific organizational outcomes are measured which the researcher presumes are affected by the exercise of power. By studying enacted power in conjunction with potential power, researchers explore when, in what way, and to what extent organizations use their capacity to influence others.

Many studies of enacted power focus on the issue of interorganizational resource acquisition in nonprofit organizations and universities (Lodahl & Gordon, 1973; Pfeffer & Leong, 1977; Provan et al., 1980; Salancik & Pfeffer, 1974). Measuring power solely in terms of an organization’s ability to acquire funding does not mean that it is also powerful in its capacity to influence decisions in other areas (Tushman, 1977). Further, these studies of interorganizational power have not addressed the extent to which power is associated with influencing another organization to do something it would not have done otherwise. That is, if an organization would have taken a certain action anyway, power was not the cause for the action’s occurrence. For instance, the action may have been taken because
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