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# A Multiple-Perspective Approach as an Inquiry System in Understanding Innovation Adoption and its Level of Use

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## Abstract

*EDI forms a complex and inter-organizational innovation, hence, using the Innovation Diffusion Theory alone is found insufficient to study the diffusion of EDI across organizations. The Innovation Diffusion Theory is concerned with individual perception (pro-innovation bias and individual blame) while lack in organizational and inter-organizational perspectives of a diffusion process. The multiple perspective approach as advocated by Mitroff and Linstone (1993) consists of assumption surfacing technique and stakeholder analysis, which emphasize the perceptions of the participating stakeholders, is proposed to provide multiple ways of looking at the diffusion process. The approach which is meant for a study of an organization is slightly expanded to deal with the inter-organizational feature of EDI.*

## Introduction

The adoption of EDI has been studied from the perspective of diffusion of innovations (Swatman, 1993, Premkumar, Ramamurthy, and Nilankata, 1994, Damsgaard and Lyytinen, 1997), which focuses on the attributes of the technology. Recent research has also focused on the inter-organizational nature of EDI by specifically considering the relationship between the two organizations considering EDI (Saunders and Clark, 1992; Premkumar and Ramamurthy, 1995; Saunders and Hart, 1997). The inherent complexity and unpredictability of the inter-organizational systems poses a formidable challenge to the control, planning and resource management. In order to cooperate under such complex technological, organizational, and political circumstances, both the promoters and adopters of the EDI-based inter-organizational system need to be aware of its characteristics as well as of the needs and expectations of the other partners (Cavaye, 1995). Yet, because of their characteristics, the level of EDI use in the inter-organizational system are not only influenced by the behavior and desires of the direct participants, rather the perceptions of all the stakeholders, that is of any individual, group, organization or institution who can affect the inter-organizational system under study need to be understood (Freeman, 1984). Thus, the following proposals are made:

- P1: Promoter's perceptions of innovation attributes influence its own adoption strategy of the innovation.*
- P2: Promoters' perceptions of the innovation have positive influence on potential adopter's decision to adopt the innovation.*
- P3: Promoters' perceptions of the innovation influence explains the adoption strategy of adopter.*
- P4: Promoter's adoption strategy has an influence on adopter's adoption strategy.*
- P5: Adopter's perceptions of the innovation reflect its adoption strategy.*
- P6(a) and P6(b): Conflicts and consensus arises from different perceptions of promoter and adopter influences the level of use of the innovation..*

## A Critique of The Innovation Diffusion Theory

Rogers' Innovation Diffusion Theory (Rogers, 1995) is the closest any researcher has come to presenting a comprehensive theory of diffusion. Based on his review Rogers found four general concerns in diffusion research: the pro-innovation bias, individual-blame bias, recall problem, and issues of equality. Pro-innovation bias is perhaps the most serious problem of diffusion research. It assumes that an innovation should be diffused and adopted by all members of a social system; that it should be diffused more rapidly; and that the innovation should neither be reinvented or rejected. This assumption is in direct contrast with IT innovations because it is not easy to describe innovations of this type as distinct, separate, and unchangeable entities.

For example, in the diffusion of EDI technology, the adopters of EDI mold the technology in accordance with their own perceptions and needs (Premkumar et. al, 1994; Bergeron and Raymond, 1992). For this reason, Rogers' traditional diffusion theory was criticized for not being robust enough to accommodate innovations that do not possess the unchanging characteristic.

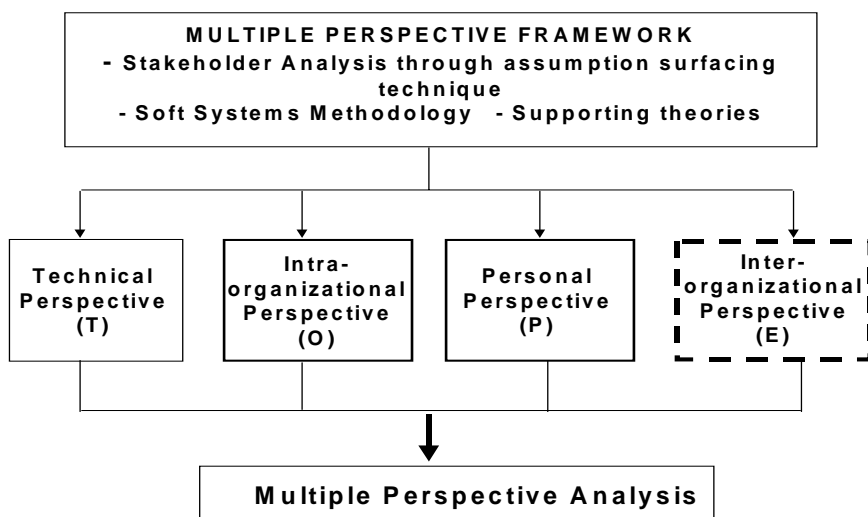
Further, the theory only addresses individual perceptions of innovation attributes which only reflect individual and technical perceptions of the innovation. Lack of concern on organizational and inter-organizational perceptions of the diffusion process is considered a serious flaw of the theory. Research show that the diffusion of innovation theory only partially applies to IT and that other approaches to complement this theory must be considered (Larsen, 1997).

## Research Framework

### *Multiple Perspective Framework*

To understand in-depth the dynamics of the EDI diffusion a multiple perspective framework as advocated by Mitroff and Linstone (1993) is proposed. The concept of multiple perspectives is intended to overcome domination by the *technical perspective (T)*, for the multiple perspective approach includes two other perspectives namely the *personal perspective (P)* of the individuals involved and the *organizational (O) or institutional perspective* of the social system in question (Linstone, 1989).

Figure 1 illustrates the above perspectives. The *environmental perspective (E)* is added to the diagram to depict the external perspective of the surrounding environment which may directly influence the decision-making process of the organization. Environmental factors may include perceptions held by the trading partners (in the case of EDI), political, legal, cultural, physical, technological and economic. Each of these perspectives is of value in that it views a system through a distinct lens and offers perceptions not encompassed by the others. The perspectives represent different knowledge interests and thus need to be considered jointly. There are no simple rules for balancing the requirements of different perspectives because they cannot be reduced in any meaningful sense to a single perspective. Thus, in using multiple perspectives we need to be able to apply methods that reflect the different knowledge interests, to be aware of the limitations of different methods, and to use judgment to reach a balance (Linstone, 1989; Mitroff and Linstone, 1993).



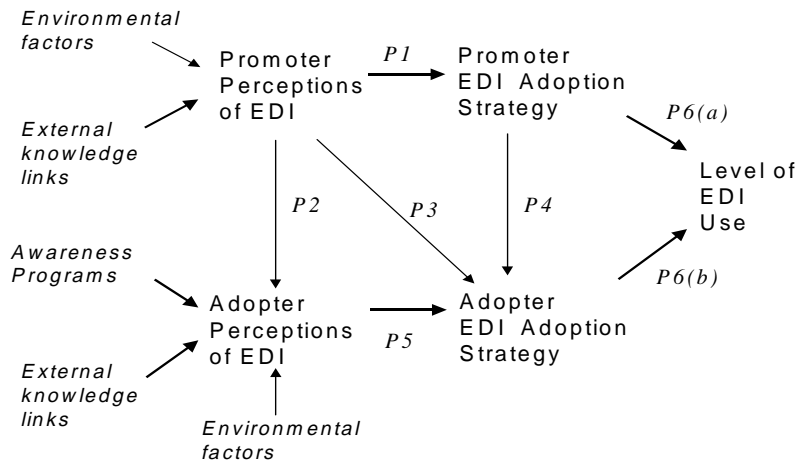
**Figure 1. A Multiple Perspective Framework and Analysis**

propositions is shown in Figure 2. Supporting theories such as the inter-organizational theory (Klein, 1995), the coordination theory (Malone and Crowston, 1993), the socio-economic framework (Klein, 1995), and the communication theory (Rogers et al, 1976) are also adopted to give direction in data collection as well as in making sense of the data.

### *The Inter-organizational Theory*

This theory is mainly concerned with the endogenous and exogenous factors of an inter-organizational relation. The endogenous factors that maybe relevant for the study of EDI diffusion are such as current firm strategies, patterns of specialization and division of labor, high quality standards, and, not the least globalization of trade facilitate rising inter-firm transactions (Klein, 1995). A number of exogenous factors, in particular structural changes in industries and changes in government's policies are affecting transaction attributes and thereby increasing transaction costs: relationship-specific investments, innovation attributes, demand uncertainty, and technological uncertainty (Clemons and Reddi, 1993, p. 811-812). And, non-contractible issues of inter-firm relations - reliability and trustworthiness of the partner, commitment to quality and innovation - has also become salient factors (Hart and Saunders, 1997). Information captured regarding the above factors may represent an environmental and inter-organizational perceptions of the study.

In the case of EDI diffusion, we are concerned with a description of the EDI diffusion process and its level of use, giving attention to the problems of interpreting the context in which the implementation takes place (an O perspective). **Soft Systems Methodology (SSM)** is one approach used to model the context of the implementation process. **Stakeholder Analysis** addresses aspects of the P and E perspectives using assumption surfacing technique (Mitroff and Linstone, 1993; Pouloudi, 1996). The T perspective is developed using traditional data- and model-based analysis as well as historical data and technical reports. The perception-based research model that shows the relationships of the



**Figure 2. Research Model Showing Relationships of the Propositions**

participants of the EDI network, whereas in less successful initiatives the coordination efforts are undertaken by third-parties and not controlled by users (TEDIS, 1994).

#### *The Socio-Economic Framework*

This framework developed by Klein (1995), is based on Parsons' Theory of social-action systems. The theory is used as a frame of reference to differentiate the generic functions of networks and to analyze the interpenetration and communication among them. Organizations implementing EDI can be viewed as networked organizations. Empirical analysis will have to identify these functional interpretations in these networked organizations and in particular study interdependencies and dialectical tensions among these dimensions that may arise during the process of EDI diffusion.

#### **Current Status**

The proposed multiple perspective framework guides the formulation of the study as well as provides methods for the inquiry and analysis of the empirical data. The study consists of multiple sites (Yin, 1993). Interviews, document reviews, personal observations are the main methods for information collection. Findings of the study are checked against propositions without ignoring new issues and diffusion patterns that might emerge from the study.

#### *References*

References available upon request from Mahfuzah Kamsah (mahfuz@fsktm.um.edu.my).

#### *The Coordination Theory*

Coordination may be defined as the act of working together harmoniously and coordination theory is the body of principles describing how this should be achieved with respect to how activities can be coordinated or actors can work together harmoniously (Malone and Crowston, 1993). For instance, many coordination processes require that some decisions has been made and accepted by a group (CT, 1997). Group decisions, in turn, require members of the group to communicate in some form.

Successful EDI initiatives are characterized by the strong involvement of future