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Soft Systems Methodology for Modeling Business Processes in EDI Implementation

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Abstract

EDI is a complex and inter-organizational innovation, hence, using traditional development methods in developing EDI applications is no longer appropriate. Several issues - technical, political, economics, intra- and inter-organizational - need to be simultaneously given serious considerations to ensure the adoption and integration of EDI into an existing information systems will truly benefit the adopting organization. Here, the authors proposed the use of the soft approach advocated by Peter Checkland as an alternative to conventional methods.

Introduction

The inherent complexity and unpredictability of the implementation of EDI systems poses a formidable challenge to their planning, development, and integration into an organization existing information systems. Organizations that leverage EDI to best advantage are those which have built up experience of exchanging EDI messages with trading partners, integrating EDI with internal systems and building up interorganizational relationships (Bergeron and Raymond, 1992, Swatman et al, 1994). The degree of integration of EDI applications with in-house applications, that is, the extent of automated processing and electronic transfer without human intervention was used as an indication of the level of integration of EDI with internal businesses. It is hypothesized that benefit not only correlated with integration with internal processes but is also dependent on the extent to which such processes are representative of the organization’s core business activities (Cox and Ghoneim, 1996). Therefore, EDI needs to be viewed in the context of its wider impact in enabling business process redesign, the opportunities it offers for exploiting information, the challenge of integration with internal systems and its use in relation to the supporting of interorganizational systems and applications (Metzgen, 1990; Wrigley, 1991).

EDI Enabling Business Process Redesign

Much of the literature referring to the role of EDI in enabling business process re-engineering use the term rather loosely to include incremental improvements rather than radical change. The impact of EDI in streamlining the business processes much depends upon the way EDI is being implemented. The bottom up approach to EDI implementation, which typically focus on the technology aspects may separate it from the business implications and its role in supporting business strategy. One reason for this bottom-up approach may be a desire to minimize potential organizational disturbance by sneaking EDI into an organization (Swatman et al, 1992). Another possible explanation is that value-added networks, trying to extend their market penetration, often persuade organizations to trial run an EDI system which later becomes incorporated into organization operations without having passed through the planning process.

Firms look for methods and tools to guide them through the implementation process but success depends more on creating top down strategic direction and the right management mindset than on choosing the right tools (Roberts and Flight, 1995). Business processes that extend across organizational boundaries need to be jointly designed and managed. This joint approach applies to intermediaries providing financial and distribution services as well as direct trading partners. The development of close business partnerships to optimize interorganizational processes remains one of the most difficult aspects in EDI implementation given not only the technology issues but the strategic, cultural and organizational implications.

Case Study

The objective of our study is to investigate the drivers and barriers to the diffusion (decision to adopt) and adoption (level of use) of EDI in a developing country. Malaysia was chosen as the context of our
study. The methods selected for this research were open-ended interviews and an in-depth case study. The interviews with local EDI vendors and selected policy makers provided a broad perspective of EDI implementation in the country, while the case study provided the depth and contextual skills needed to focus on particular aspects of the research (Yin, 1989).

Our findings showed that after more than five years EDI was introduced in Malaysia, the benefits gained through its adoption is still minimal system (Kamsah and Wood-Harper, 1997). One major reason for this is a poor integration of EDI into the organization’s existing. For example, the adopting permit issuing agencies in the government and the Customs have integrated EDI into their business processes but its use is primarily in the traditional context of EDI, that is exchanging shipping and permit application documents. In these cases, EDI is partially integrated with the organizations’ internal processes which are not representative of their core business activities such as permit issuance and revenue collection. The absence of strategic systems planning and lack of appropriate methods and tools to identify relevant business processes within and across the adopting organizations are recognized as the main reasons for the poor performance of EDI integration.

Our findings also observed that technical requirements in terms of selection of communication technology, value added network services (VANS) and standards did not present problems. This would suggest that the problems of EDI integration are more organizational rather than technical such as lack of knowledge and experience of the developing team in the design and development of inter-organizational systems, lack of authority or political power of the team to elicit user requirements across organizations, and lack of trust of the participating organizations among themselves and towards the team. It would also suggest that the de-facto structured system development methodology known otherwise as SSADM (NCC, 1994) is no longer appropriate as a development tool for the development of EDI systems. What is required is a system development methodology that allows a reflection and learning process.

The need for new system development methods is highly critical as Malaysia is currently executing and about to embark into many IT programs that would involve the development of complex, inter-organizational systems such as electronic commerce, electronic government, and telemedicine. Experience gained in developing EDI applications would prove invaluable in these projects. The time has come for the Malaysian IT personnel to shift from using conventional development methods to the new ones which is more flexible and more appropriate for understanding loosely defined problems as commonly found in developing complex systems such as EDI. Here, we propose a soft systems approach advocated by Peter Checkland (Checkland, 1981, 1990) to replace the conventional hard and structured methods in identifying relevant business processes for the implementation of EDI systems.

**Soft Systems Methodology (SSM) in Modeling Business Processes**

SSM developed by Peter Checkland at Lancaster University (Checkland, 1981) is one approach that has potentials to be used to model the context of the EDI implementation process. The essence of Checkland’s approach to identify problem areas in a system can be applied in identifying organizational functions that may be made more efficient by using EDI, and then to model only those business processes which are relevant to those functions. Checkland call this identification of a relevant system. In addition, SSM advocates understanding each business process within its context through CATWOE (Customers, Actors, Transformation, Worldview, Owners, and Environment) criteria. Together with CATWOE’s stakeholder analysis and assumption surfacing technique, SSM provides identifying unstated assumptions, unwieldy patterns of authority, and disagreements on underlying principles (the worldview). This would lead to an open forum to resolve the conflicts or gain consensus from the stakeholders. SSM’s Rich Picture acts as a tool to further elicit understanding on the nature and sources of conflicts and inconsistencies between the EDI trading partners. When adequately understood, these pictures could provide additional important information about the social and organizational contexts of different viewpoints.

**Conclusion**

In order for Malaysia as a developing country to ensure high level of use of EDI, the right approach in the development of EDI applications is crucial. To achieve high degree of internal integration, the developers need to know the relevant business processes that may benefit from the adoption of EDI. SSM offers attractive and promising features which are appropriate for EDI development. First, SSM is flexible and contingent in its approach as opposed to SSADM and other hard conventional methodologies which is rigid and data flow oriented. Second it is interpretive in nature that takes into account tacit requirements, thus, greater chance of meeting user requirements.

Adopting this soft development approach requires
the IT personnel to be retrained to acquire new skills. The government and the organizations concerned should play their supporting roles in advocating changes in the development approach. A framework need to be developed for EDI development in the developing countries using the soft approach.

References


