

Inhibitors to Adoption of Electronic Commerce

The inhibitors to the adoption of electronic commerce (EC) techniques are both the real and the perceived risks or costs associated with the implementation and participation of an organisation in an electronic commerce environment. Some of the perceived risks, on closer examination, are not real, and indicate the need for a better understanding of the essentials to effective use of electronic commerce techniques. Other risks are real, but once understood, can be sufficiently managed to ensure that they do not discourage implementation of techniques, which otherwise offer significant benefits in a large variety of business situations. This paper identifies inhibitors which have been observed in planning and implementing EC techniques in the trade and transport industry, and in the government sector in Australia.

A major risk associated with implementing EC techniques involves failing to recognise, and hence manage, the unique characteristics of electronic commerce

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applications. The greatest difference between electronic commerce applications and normal applications is that electronic commerce applications are inter-organisational and hence involve multiple organisations. Normal applications, or those with which people are most experienced, are usually intra-organisational and hence confined to a single organisation. Being inter-organisational means that:

- the application is not owned and controlled by one organisation
- the implementation of the application, including assignment of resources, priorities, and determination of timeframes cannot be determined or dictated by one organisation
- the relative costs and benefits may vary from organisation to organisation
- the realisation of sufficient benefits to justify the investment by any particular participant may require a critical mass of other participants

Each of these features have implications for planning and managing the implementation of electronic commerce projects.

Business Case for Implementation

It is clear that the business case for adopting EC techniques is not so compelling that an organisation will adopt it as soon as one customer or supplier requires this mode of operation. Rather, there must be the volume of business to generate sufficient benefits to offset the costs of implementation and operation. The business case for an individual organisation is influenced by a number of factors, including:

- the number of organisations (whether customers or suppliers) with which the

organisation proposes to transact business electronically

- the likely takeup rate, implementation timescale, and hence period required to achieve a return on investment
- the possible imbalances in benefits realisation and/or benefits sharing between the originators and recipients of the business transactions
- the extent to which implementation covers the entire transaction chain or only part of the chain

Ideally, a business would like all customers and/or suppliers to trade electronically, enabling avoidance of the more expensive manual processes, or a mixed mode of operation which may be more expensive than either manual or fully EC enabled processes. Small and medium enterprises are often characterised as not being able to afford the entry costs of electronic commerce. If they are only going to implement EC techniques for one customer, there won't be sufficient return. If there is a significant base of customers, eg. all Government agencies, then the situation might be quite different.

Hub and Spoke Participants

Electronic commerce applications commonly involve two types of organisations - 'hubs' and 'spokes'. It is important to understand the differences between these two types of organisational roles, as these differences also influence the likely success of any EC implementation. The hubs are the centre of the transaction flows. Examples include:

- a major retail chain purchasing each of its sale lines
- customs service clearing import and export documentation
- courts administration receiving and issuing court documents.

The spokes are the many other organisations interacting with the hub. In the above examples, the spokes are, respectively:

- the wholesalers, distributors and banks
- the importers, exporters, customs brokers, forwarders, shipping lines and banks
- the legal firms, police, correctional institutions and other government authorities

There are a number of ways in which electronic commerce differs for hub and spoke organisations, including:

- the relativity between costs and benefits
- the sharing of benefits between hubs and spokes
- the connectivity alternatives

Cost and Benefit Relativity

The relativity between costs and benefits often differs significantly between hub and spoke organisations. For a customs service, the prospect of receiving all manifests electronically generates a significant staff productivity opportunity. However, in Australia, this total transaction volume is shared across at least fifteen to twenty different shipping lines in about ten different ports. This smaller transaction volume represents a smaller opportunity, set against similar capital costs for initial implementation, and impacts significantly on the business case for participation by any specific shipping line.

For a government utility, the prospect of issuing all purchase orders electronically also generates a significant staff productivity opportunity, and can often be implemented using existing computing infrastructure without the need for major investment. However, this total transaction volume is often shared across numerous small suppliers, for whom the entry costs of hardware and software represent a significant investment, set against a smaller staff productivity opportunity.

Benefits Sharing

Not only are there different relativities in costs and benefits, but often hub organisations seek to dominate the implementation and are not prepared to share the benefits with the spoke participants. Examples include:

- purchasers who wish to gain more timely and reliable supply of goods, but are not prepared to pay on receipt and provide benefits to suppliers through eliminated invoice processing and earlier payment cycles
- large government authorities who have used their position to force transmission costs on recipients of government transaction messages, rather than

aligning with an industry agreed principle of 'sender pays'

For earlier, more successful operation, an approach needs to be taken whereby all participants win and gain a share of the often extensive benefits deriving from adoption of electronic commerce techniques.

Connectivity Alternatives

Another issue which differentiates hub and spoke implementations relates to the connectivity alternatives. For large hub organisations, the transaction volume is often sufficient to justify establishing a direct online connection to the network of their choice. Hence, transactions sent by them or to be received by them do not face any communication delays, due to the timing of batching transactions for transmission or collecting transactions from a mailbox.

For small organisations, the transaction volume may not be sufficient to justify continuous connection, and these organisations must revert to dialup approaches. This requires the organisation to establish mailbox collection practices so that their trading partners understand the time delays in message collection, and can optimise the transaction process time. The difficulty that these small organisations face is that it is not possible to anticipate or predict when messages will be in their mailboxes.

Once this is understood, it is possible to design a solution. Rather than implementing a 'store and collect' process, networks could provide a "store and forward" process, whereby the presence of mail in a customer's mailbox prompts the network to dialup the customer and transmit the message. This would overcome the difficulties associated with not knowing the timing of message receipt.

Inter-organisational Process Design

Redesign of inter-organisational processes is a poorly understood and executed activity. Such processes need to address:

- the alignment of expectations, priorities and resource allocations by the different participating business organisations
- the absence of documentation of business interactions, and a paucity of knowledge of how entire industries operate, particularly in relation to the interactions between the different types of organisations
- the means by which decisions can be made about adoption of new modes of business interaction and information flow

Strategies for addressing these important issues include:

- provision of leadership and resources by industry associations
- undertaking an assessment of current industry practices and information flows
- engaging appropriately skilled process designers to facilitate industry driven process redesign
- piloting proposed approaches to validate proposed new processes

Further research into effective inter-organisational design processes is certainly a critical issue to the better management of the risks in electronic commerce implementation and hence the more extensive adoption of electronic commerce.

Application Integration

Another inhibitor is the cost associated with integrating the EC techniques with the existing applications. Dependent on the nature of the applications, and their operating environment, redesign of the application to suit the new business rules, and to support automatic receipt / transmission of EC transactions, without the need for manual intervention may be a significant cost, particularly to small organisations. Initially, EDI implementations were based on use of 'service provider operated mailboxes'. The development of LAN-based messaging environments within many organisations and the adoption of related application standards (eg. MAPI, VIM) has allowed several improvements:

- the service provider is now simply providing a message transport / switching service
- the point of integration of the message flow with the application is totally within the organisation
- the application interface standards allow easier integration into commercially available application packages

This will allow the incorporation of standard EC capabilities within common application packages used by small businesses and will substantially alleviate the problems being experienced in this area. Related to this point, a basic assumption of EDI is the existence of an application within each trading organisation, eg. the existence of a purchasing and accounts payable application in the purchasing organisations, and the existence of an orders and accounts receivable application in each of the supplier organisations. Often EC implementations have involved and required the development and implementation of message issuing / receiving applications for particular participant or-

ganisations, as has been the case for exporters generating bookings, forwarding instructions and other export documentation. This adds to the cost and the timeframe for implementation across the entire industry, as additional investment is required to establish this 'assumed' basic infrastructure and additional time is required to develop and implement this 'assumed' infrastructure.

Previous Failures / Slow Progress

The adoption of EC techniques has been advanced as beneficial to various industries for many years now. The failure of various projects and the slow rate of adoption generates scepticism and concern for new entrants who immediately wonder whether the benefits of EC are really achievable. Once again, past failures and slow adoption rates are only symptoms of the real problems. Often these problems relate back to issues identified already, including the lack of understanding, experience and attention to:

- inter-organisational process design issues
- project management of inter-organisational implementation projects
- inter-organisational business case issues

Conclusion

As can be seen from the issues identified above, the majority are quite resolvable. It is necessary, however, that industries or business communities implementing EC techniques understand these issues, such that appropriate management arrangements can be established to ensure that the implementation of inter-organisation systems is not unnecessarily impeded. ■

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