INTEGRATING E-COMMERCE INTO THE RETAIL SUPPLY CHAIN

A Roadmap for Implementation

BOB ROBERTS[1] and GLYN THOMAS[2]
[1]*School of Computing & Information Systems, Kingston University, United Kingdom*
[2]*HP Consulting, United Kingdom*

Abstract: E-commerce systems in the supply chain extend beyond inter-organisational transfer to an integrated and optimised information flow across a value chain. Adoption of such systems, however, has proved extremely difficult since they span organisational boundaries and involve interaction with external entities such as trading partners and third parties that may have different and conflicting interests. In addition, adoption of such systems typically involve significant changes to organisations' culture, structure, business relationships and working practices. This retail sector case study is based on an eclectic mix of methodologies and considers an approach to implementing an Internet based solution to support the supply chain of a department store whose supplier mix precludes a dictatorial approach by the retailer. A challenge in doing this has been in choosing the appropriate method at each step. The introduction of electronic commerce, for example, can cause a change in the internal and external relationships. This is highlighted by looking at the value system of the cross enterprise links which are being changed and the effect on the internal value chain. To enable the implementation a number of different approaches were crucial to understanding the stakeholder requirements, to optimise the information flows and to realise the potential for redesigning business processes. Whatever the technical option chosen for implementation of electronic commerce there is a need to understand the business processes and identify the information flows to optimise the value added in the supply chain. The paper concludes with a roadmap of the methods for analysing the needs for successful e-commerce implementations from a technology, business process and organisational perspective.

The original version of this chapter was revised: The copyright line was incorrect. This has been corrected. The Erratum to this chapter is available at DOI: 10.1007/978-0-387-35692-1_36

K. V. Andersen et al. (eds.), *Seeking Success in E-Business*

1. INTRODUCTION

E-commerce systems in the supply chain extend beyond inter-organisational transfer to an integrated and optimised information flow across a value chain with application to application dialogue between organisations and associated changes in operations and functions. Adoption of such systems, however, has proved extremely difficult since they span organisational boundaries and involve interaction with external entities such as trading partners and third parties that may have different and conflicting interests. In addition, adoption of such systems typically involve significant changes to organisations' culture, structure, business relationships and working practices. This evolution to even tighter integration through Internet enabled collaborative interrelationships and interdependencies in the supply chain therefore requires analysis from political, cultural. operational and technological dimensions.

This introduction is followed by section 2 which reviews the literature concerning the development of electronic commerce in the supply chain and identifies a common theme of the holistic implication of e-commerce implementations through from earlier EDI implementations through to e-markets. Section 3 summarises the research methods adopted in the case study to analyse and to provide an understanding of these wider issues. Section 4 deals with the case study which provided a rich environment in which the methods were applied to understand the implications of implementing internet based EDI to support supply chain management in the retail environment. The concluding section argues that the approach applied in the case study may have generic applicability in understanding not only of the capability of the underlying technology, but the impact of its deployment on supply chain processes, the optimisation of data flows to enable good information management and the opportunities for redesigning the extended value chain.

2. A REVIEW OF ELECTRONIC COMMERCE IN THE SUPPLY CHAIN

Today's typical supply chain is often complex, as it comprises multiple networks of customers, trading partners and distributors, each with their own set of requirements. It is also characterised by fragmentation made up of a geographical spread with a mixture of proprietary systems and manual processes. In such a configuration a supply chain is only as good as its weakest link. Inter-organisational business process automation and technical

integration represent significant challenges that are obviously greater than those faced internally within organisations. However, the links are not only made up of the enabling technology. With increasing depth of collaboration, interpersonal and inter-organisational relationships, trust and communication also become critical factors in ensuring the exchanging and sharing of information.

Traditional electronic data interchange (EDI) and the benefits to be gained from its implementation have been understood for many years. EDI can be implemented purely as a data transfer mechanism with manual intervention at either end but this has limited benefit. To optimise benefits EDI needed to be integrated into internal and external organisation systems (Chan & Swatman 1998). The true goal of EDI therefore goes beyond inter-organisational transfer to an integrated and optimised information flow across a value chain with application to application dialogue between organisations and associated changes in operations and functions (Sokol 1995, Swatman & Fowler 1994).

With EDI there has been a large growth in efficient stock control initiatives such as JIT (Just in Time). Initially established in manufacturing, industries such as retail are now particularly active with initiatives such as QR (Quick Response), VMI (Vendor Managed Inventory) and ECR (Efficient Consumer Response), fuelled by the large number of products and suppliers that need to be controlled. In some areas such EDI based programs have become a requirement rather than a differentiator (Donington & Hall 1994) and allied to this is the development of electronic catalogues and EDI for advanced information such as planning, price and product information. Such initiatives reflect the need to link supply chain constituents into a tightly knit network of communications and functionality for competitive advantage.

Poirier and Bauer (2000) refer to supply chain management as an approach that continuously improves an organisation's integrated processes for product and service design, sales forecasting, purchasing, inventory management, manufacturing or production, order management, logistics, distribution and customer satisfaction. Such an approach requires a company to take an external view of its business environment and then collaboratively identify the vital supply chain processes that will differentiate the network for mutual benefit. Poirier & Bauer (2000) also argue that businesses will be increasingly compelled to learn how to use e-commerce technologies in collaboration with other business or risk failure in this new digital business environment. Alt et al (1999) suggest a complimentary relationship between electronic commerce and supply chain management with the former concentrating on shaping information and contracting activities (for example through electronic catalogues) while the latter is mainly concerned with

planning processes and the flow of goods. This convergence of supply chain management and e-commerce provides the opportunity to provide integrated network collaboration. However, there is a need to examine this phenomenon from the perspective of the power dynamics within and between organisations which to some extent set the agenda for what strategies are possible for firms.

The ubiquitous presence of the Internet and associated low cost network access has facilitated the more widespread use of inter-organisational communications and information sharing. The Internet has brought new possibilities for Business to Business (B2B) trading, especially with small and medium sized enterprises (SMEs) who previously considered the financial and resource cost of EDI prohibitive (Roberts & Thomas 2000). Some companies, such as Sainsburys supermarket in the UK are now using the Internet to establish EDI links with small suppliers previously not on-line to them (Goodwin 1998). The use of such community extranets for collaboration and for managing the supply chain can extend the organisation by enabling communication up and down the supply chain and transform relationships with suppliers and clients (Chan & Davis 2000, Senn 2000).The Value Added Networks (VANs), which traditionally acted as third parties and provided EDI services over proprietary networks, have reworked their strategies to include the Internet. WWW based services, for example, have been launched that enable large companies to receive documents such as HTML based purchase orders from small firms that traditionally have not used EDI software and VAN services (Threlkel & Kavan 1999, Roberts & Thomas 2000). New intermediaries have also appeared providing services to facilitate the marketplace via such value added services as specialised directories, brokering, referral, and supplier certification (Butler Group 2001, Tang et al 2001). These various developments now point to full scale business to business electronic commerce becoming a reality on the Internet or on community extranets.

Collaboration in the supply chain is driven by far more than simply the desire to control costs as it provides the basis for addressing the traditional gap between customers needs and supplier performance. Harris and Parfitt (1996) stress that in order to have an electronic commerce strategy there need to be an understanding of the components of electronic commerce, their inter-relationship and impact on traditional business processes. The term electronic commerce is used here to refer to not just a single technology but a combination of technologies, applications, processes, business strategies and practices necessary to do business electronically (Taylor & Berg 1995). Implementation can promote co-operation between partners and those organisations that develop mutually beneficial relationships can compete more effectively (Roberts & Mackay 1998). Electronic Commerce therefore

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 implementation through supporting technologies and applications.

There is also an increasing interest in trading through Internet based electronic marketplaces and exchanges. Initiatives such as Global NetXchange (www.gnx.com) and Transora (www.transora.com) reflect the developments in B2B Exchanges with a retail focus. Friedman (2000) suggests that the term "SupplyWebExchange" best describes how established supply chain management techniques and industry trading practices will eventually integrate with the evolution of the B2B digital environment. The common theme is one of providing collaborative solutions over the Internet including procurement and supply chain management. The promise for all participants is for a more reliable, efficient and responsive supply chain with specific benefits in areas such as reduced operational costs, shorter lead times, lower inventory and improved customer service. UK supermarket Tesco, for example, claims to have nearly reclaimed its $2 million investment after only a few months (Mathieson 2000). However, recent reports on emerging B2B exchanges indicate the reluctance of suppliers, and SMEs in particular, to participate based on a scepticism of win-win promises as they fear that exchanges will cut into profit margins or turn their products into commodities (Baldi 2001, Butler Group 2000, Poirier & Bauer 2000). Glick (2002), for example, reports that BuyIT, which is an independent and U.K. government backed forum created to share the experiences of different organisations with e-commerce processes, hosted workshops to examine the concerns of suppliers about e-marketplaces. The feedback reflected supplier concern and wariness that such initiatives were driving down costs at the expense of suppliers.

Building a successful B2B model is not an easy task and requires a clear understanding of a number of issues including the structure of the supplier base, where the inefficiencies are in the value chain and how IT ready potential partners are (Mercer 2000). Shared benefits are crucial to the concept of a value network where a collaborative approach enabled through a digital network binds closely integrated business communities (Bovet & Martha 2000, Bresslet & Grantham 2000). Whatever the technical option chosen for implementation of electronic commerce there is a need to understand the business processes and identify the information flows to optimise the value added in the supply chain.

3. RESEARCH APPROACH

The case study used an eclectic mix of methodologies to define the business practices and areas of change required by the retailer. A challenge in doing this was choosing the method at each step. Soft Systems (Checkland & Scholes 1990) led to the conceptual model and real world comparison but thereafter a selection of elements of tools and methodologies were used including process models and the value chain (Porter 1985). One problem was to find methodologies leading on from the Soft Systems Methodology for analysis and presentation of the various information sources in a fashion which is integrated but not overly complex. The tools used satisfied this requirement but are not necessarily the only approach.

Soft Systems Analysis (SSA) was used on the project because at the start of the work the situation was unclear. It was known that the company was trying to improve their supply chain but there appeared to be a number of inter-related issues and the positioning of electronic trading in this was not clear. Furthermore, there were no clear measurable objectives. Problem areas had been identified but there were no defined business targets. The viability of this approach is also confirmed by Chan and Swatman (1994) who claimed that, while they had not identified an appropriate modelling technique for the process of EDI integration, Soft Systems Methodology might prove to be the appropriate approach because it allows for multiple viewpoints, comparison with the real world and subsequent refinement of the model.

At the start of the study it was thought that the issues would relate primarily to the retailer and their internal supply chain control but this approach also highlighted the additional interrelated area of the rate of take up by the suppliers and how this was affected by the responsiveness of the service provider and level of involvement of the partners. Soft Systems helped to coalesce the issues into two main themes. The use of process model diagrams for the conceptual models provided a further framework for considering the real world activities and for defining and presenting the tasks, issues and recommendations.

The information gathered was used to carry out a cultural analysis of stakeholders and roles involved in the situation and also to consider the situation as a whole by means of a rich picture, identifying such issues as inter-departmental processes, interaction with partners, system integration, timescales and constraints. The holistic approach of Soft Systems Analysis highlighted areas of concern with the progress of implementation and with how the company intended to integrate the use of I-EDI into its existing organisation, processes and IT systems. From the rich picture (figure 1) two main problem themes were therefore extracted; issues in getting I-edi started

with suppliers and requirement for a strategy for using I-edi within the supply chain.

An analysis of intervention (i.e. client, problem owner, problem solver) was produced which identified gaps in the ownership of these problems. A parallel activity of Political Analysis (via Stakeholder analysis) showed that there were a number of stakeholders (primarily the Buyers) who were not involved in the systems development, i.e. this was being approached as an IT problem when much writing recommends that implementing EDI is foremost a business problem. This analysis involves considering those parties affected by the implementation and those in a position to have an affect on the implementation from the standpoint of the current situation and the ideal or target situation.

From the rich picture, tasks and issues were derived which were used as a basis for comparing the real situation with a conceptual model. Conceptual models are about activities and the aim of the organisation was to change how they operated in the ordering and receiving parts of the cycle (albeit through having more consistent and higher quality information). For these reasons it was decided to use a process based approach to this part of the analysis to produce static models (figure 2). This was a useful way of documenting the two problem areas and identifying areas for possible improvement.

The next stage of the study took the process models produced for the supply chain and used these as the basis for a more structured set of interviews with staff and for activities to follow the supply chain processes in action and to identify the paper chain. The objective of this approach was to capture the information needs for each step of the supply chain and to identify how this was provided within the company. This was captured in tabular form and then represented in deployed flow chart form. The advantage of the flow charts is that they graphically show the movement of information between departments and roles in the organisation (with an implied time line). By including the existing information systems and by introducing colour and shape it can quickly be seen what information is on paper and also where new information is created (or value added). This enabled potential intra-departmental changes to be identified and also pointed to the inter-departmental information links such as the goods received note (GRN). The understanding of the usage this produced also allowed the requirements placed on the technology to be revisited with regard to interfaces into other systems (such as accounts) and processes along with usability aspects of the selected system.

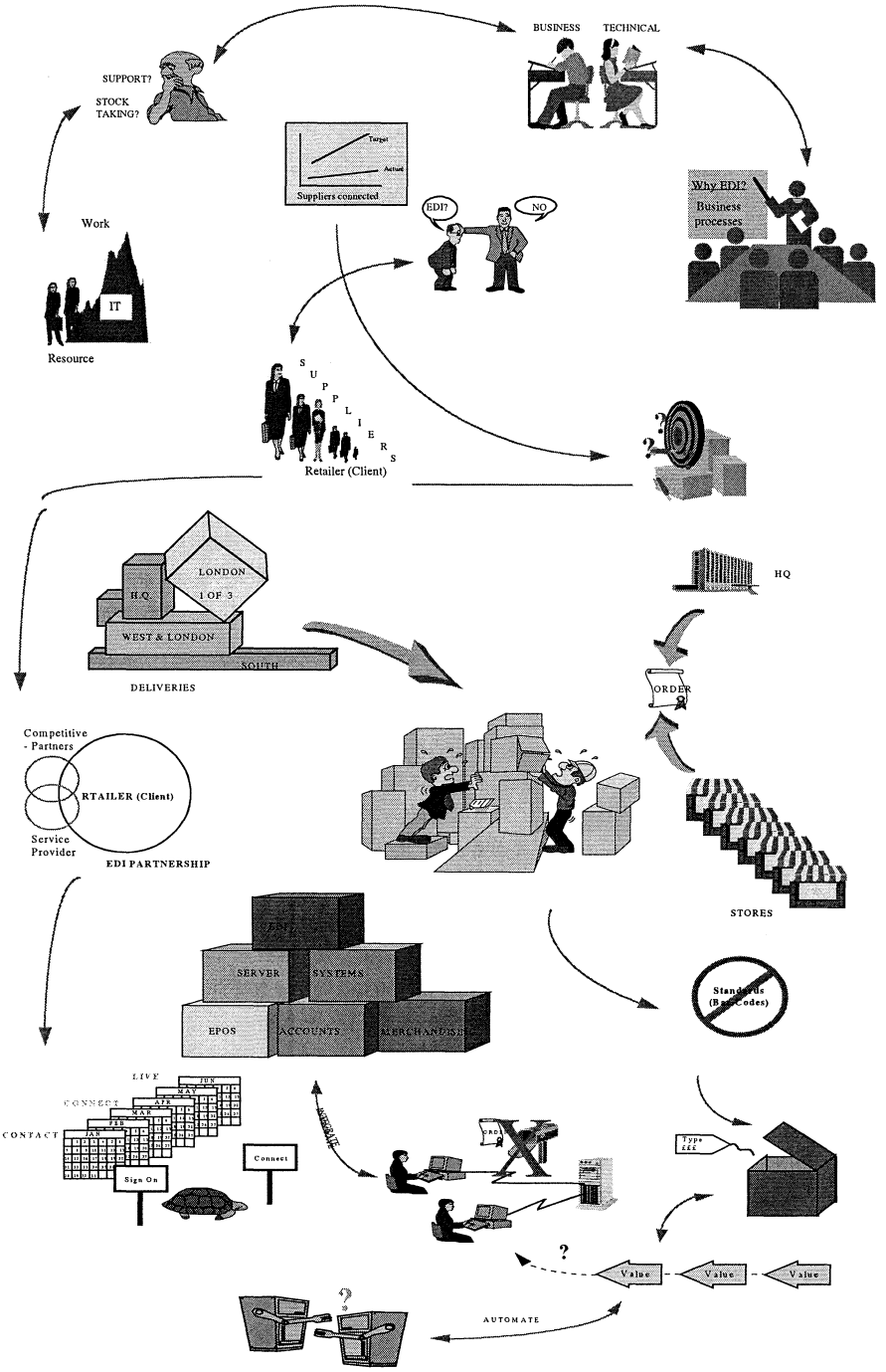

Figure 1. Rich Picture

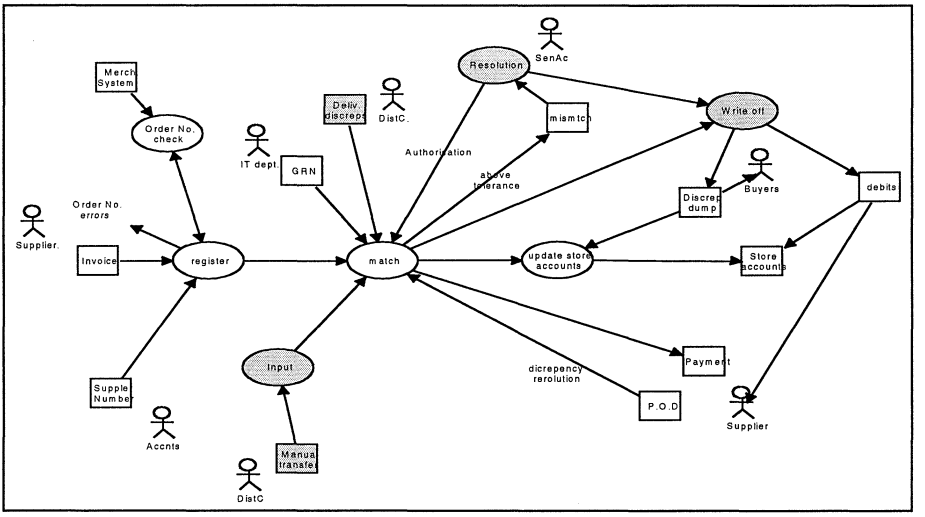

Figure 2. Sample Process

4. CASE STUDY

4.1 Background

The case study is based on a department store chain who are competing against some of the largest organisations in the UK retail industry. A critical success factor to remaining competitive is to increase the effectiveness of their supply chain especially with regard to removal of errors and reduction of inventory holdings. An established way of achieving this is the use of EDI. However the traditional approach to EDI was not a financially acceptable option for the company and many of its suppliers. They have therefore adopted an innovative approach to using features of traditional EDI combined with internet technology to overcome this barrier.

The e-commerce infrastructure was established on the basis of collaboration i.e. through the shared development / common adoption of technical standards and process norms, and the joint funding through

partnership with competitors of infrastructural elements and intermediary services. A key element in provision of these intermediary services was a partnership with a third party technology provider to ensure access to the appropriate infrastructure and 'know how' and also to have a positive influence on future service development.

The company has a varied product line, including items as diverse as toys, furniture, perfume, glassware and clothes, which are structured into major departments. The departments are managed independently within each store but the product range for a department will be set by a buyer operating across all stores. In providing this product range they trade with 2500 suppliers. These range from large internationals to small specialist suppliers. Overall they operate with over one third of a million stock-keeping units (SKUs). The range and product volumes can also vary with seasonal trends and events. Added to this the orders can be placed either by a number of corporate central buyers or, within certain bounds, by staff within individual stores. Suppliers may deliver goods to a main distribution centre or direct to a store, however the stores are generally supplied via the distribution centre which also carries out checks, inspection and ticketing on supplier deliveries.

4.2 The supply route

Stock generally flows through the distribution centre. When a delivery is received in the distribution centre it needs to be checked against orders. Due to the mix of delivery types and the lack of external coding all deliveries have to be debatched. Vetting will take place against a copy of the order which is system printed or hand-written depending on the products and the source of the order. Order system inconsistencies then require manual totalling of the value of the delivery for system input. Lack of consistent supplier bar-coding and ticketing necessitate the further step of each package being opened so that individual items can be ticketed and finally batched for shipment to store. (See figure 3).

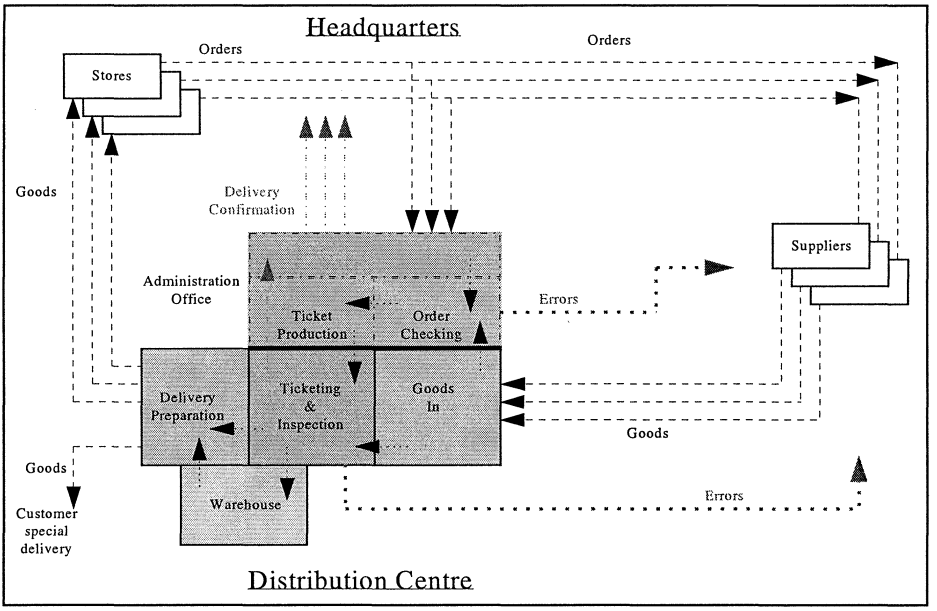

Figure 3. Supply process

4.3 Effect on the Value Chain

The introduction of e-commerce will cause a change in the internal and external relationships of a company. This can be highlighted by looking at the value system of the cross enterprise links which are being changed and the effect on the internal value chain.

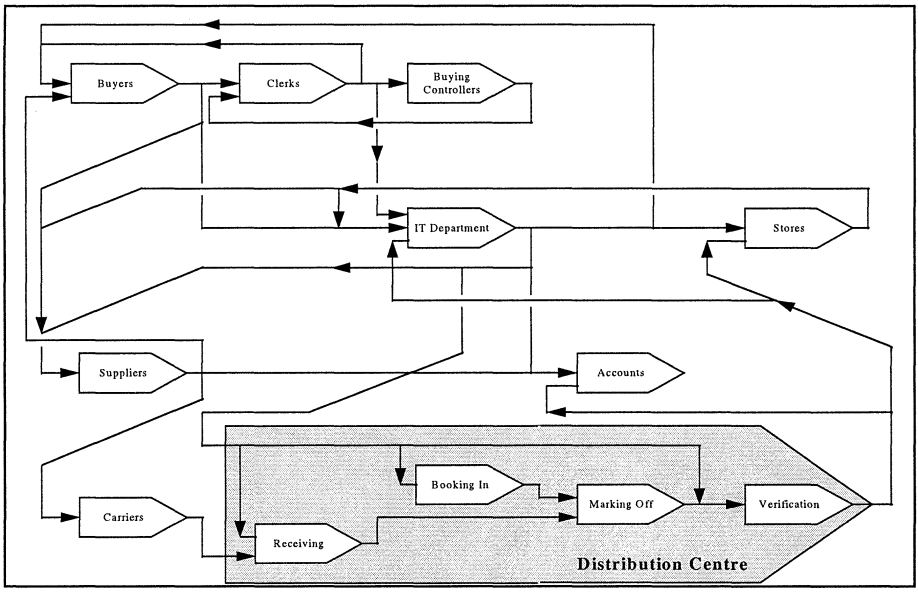

Figure 4. Current Value System (Supply)

For the retailer the upstream supply chain currently involves suppliers and carriers (see figure 4). In this diagram the linkages between the departments, organisations and roles involved in Ordering, Receiving and Paying are shown.

As can be seen from (figure 5) the introduction of e-commerce will alter these relationships. The distribution centre will still receive goods and information from the carriers but information from the suppliers will also now be supplied (via the IT department) to the distribution centre in the form of an electronic advance shipping note (ASN). There will also be a change in flow through the distribution centre. The direct link between the distribution centre and accounts will be diminished to discrepancy reporting only. New product information will be sent by suppliers only to the IT department who will format it for buyers' approval. The stores and buyers can place all orders through the corporate system and these will be sent electronically to the suppliers. The direct link for orders from buyers and stores to suppliers can be removed. Similarly paper invoices sent directly from suppliers to accounts can be replaced by electronic invoices delivered to accounts via the IT systems.

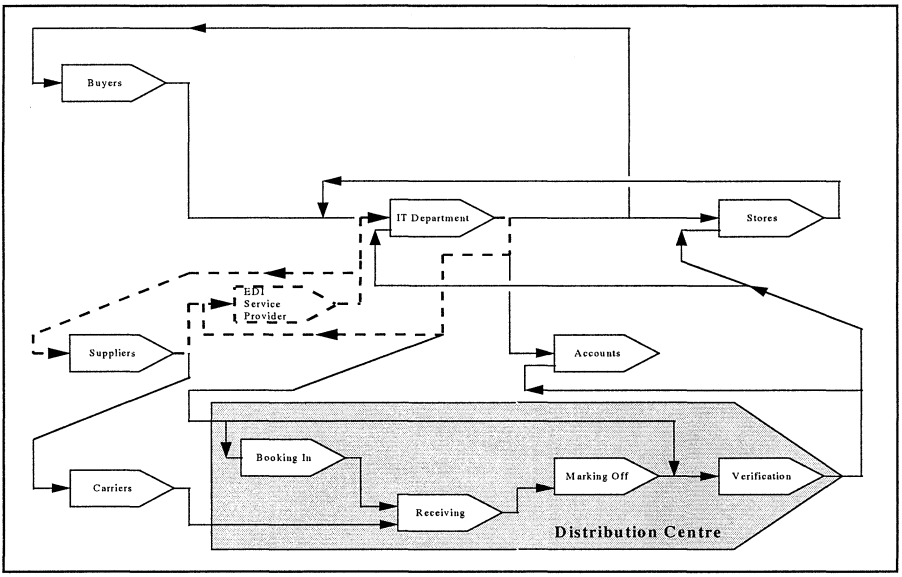

Figure 5. Value System (Supply) with I-edi

The addition to the system (shown in dotted lines) is the third party service provider who will become an intermediary for all routine traffic to and from the suppliers, including replacing the previous fax based order link from the IT department. This highlights the importance of the relationship with the service provider. The role of the IT department is also emphasised. With proper use of I-edi there should be increased flow of information to and from the suppliers and the IT department will be the single point of contact for information in and out of the retailer. Although single points of contact have potential risks such as performance it is considered be most effective to run EDI in such a fashion. The implication is that the IT department also becomes the one support organisation to handle all I-edi issues between the retailer and its trading partner base and therefore needs an established relationship with the service provider's helpline.

4.4 Implications of case study

The case study highlights the importance of information in facilitating the flow of goods in an effective, consistent and reliable manner. The advantage that the openness of the Internet can bring needs to be supplemented by reaping the benefits of integrating e-commerce into current business processes. To be successful businesses need to become more effective in managing the extended enterprise and co-ordinating the internal

and external partners in the supply. The redesign of value added activities in the case study, for example, reflects the key role of the service provider in the realisation of reduced order cycle times, more accurate information and other benefits identified in the section on business drivers. Similarly, the meeting of demand and supply through catalogues offers real gains in efficiency and accuracy and the case study analysis highlighted the importance of the IT department as the focal point for all catalogue changes.

4.4.1 Relationship with Suppliers and Service Provider

A number of recommendations were identified which will change the working relationship with suppliers. An increasingly important consideration is the organisational and management implications of operating a virtual organisation with another company in a key position. With I-edi, as can be seen from the value chain, the service provider will become an integral part of the company's operation. Once the retailer have several hundred suppliers linked electronically they will themselves also be linked intimately with the service provider. Items such as their availability requirements, legal considerations (e.g. audit), and their strategy in terms of price commitments and long term partnering with the service provider therefore become prime considerations for the retailer. Furthermore the relationship with the specialist service provider will require development through the identification and fostering of common interests as well as formal agreements.

4.4.2 Internal relationships

The potential changes due to implementation of an electronic trading system raise a number of structural issues, for example within the Buying and IT departments:

Direct ordering by stores from suppliers representatives can be removed, thereby changing internal and external relationships.

Buyers can be more empowered on a day to day basis by the removal of manual authorisation processes so alternate periodic check and authorisation levels need to be introduced.

Buyers have been the contact point for suppliers. However I-edi usage implies that the IT department should be the interface for catalogue information.

In controlling catalogue updates the IT department will be monitoring responsiveness of approvals by Buyers. It could be seen as unsatisfactory to have an operational unit place demands on a business function. Buyers need to be actively involved in the I-edi programme and recognise it as a tool to

use, with the information systems providing support to the Buyers for business decisions. This was also found to be the case in BT's implementation of e-commerce in supply management (Roberts & Mackay 1998).

The company has a small IT department. With the introduction of I-edi they become more critical to the business in three areas:

They provide a greater level of functionality to the business therefore it is essential that they have a sufficient support capability.

They will be a contact point for suppliers with I-edi related problems so again this capability needs to be sized and assessed.

They will be the focal point for changes and for ensuring that information is up to date and especially for managing the peaks, such as the fashion season changes, in a cost effective manner.

5. CONCLUSIONS

The paper uses a case study to give a retail sector perspective on the use of different methods and approaches to understand the impact of implementing electronic commerce within a particular environment. Traditionally e-commerce has been fostered by a strong technology push but it is clear from this case study that the inherent potential of Internet based EDI can only be realised through a holistic understanding of implementation issues.

The digitisation of ordering and product information has implications for transaction costs and information availability. However, there is also a risk of increasing costs and mismanagement unless the full process and organisational implications are identified. Mutual understanding between communicating partners is a lot more complex than just the exchange of data and a soft systems approach can be a powerful tool to highlight key issues and stakeholder concerns. The methods discussed in this paper vary in their scope but include both an analysis of the internal business processes of the retail organisation as well as highlighting the inter-organisational issues with suppliers and the service provider.

Findings from the case study indicate the importance of cultural factors in establishing a suitable environment in which collaboration and information exchange may take place and flourish. This requires a social environment based on consultation both internally and externally with suppliers and partners. Creating such a background appears to be a case of cultural evolution but the role of management vision and commitment through clear leadership in setting the general climate is critically important.

Politics, power and influence are important to consider in the context of e-commerce as availability of low cost technology does not guarantee either volume of users nor a willingness to use the medium to support new ways of working. Lack of commonality and congruence of objectives may create major barriers. It was clear that some companies preferred to continue using existing manual processes that they knew would work with a minimum of problems, rather than radically overhaul existing business practices and systems to implement electronic links. Another key source of frustration was that their trading partners were often not on the same level in terms of IT skills, budget, staff availability etc. In addition to important political and vested interests within the organisations there were also differences in perception between the constituents of the extended enterprise. Building relationships is a difficult process but having an intermediary in the position of the e-commerce platform provider may also be perceived as intervening in established relationships. Evidence from the case study also highlighted many instances of the disparity between the language used to articulate the desire to collaborate and the commercial reality of how power is exercised in implementing the practice. These issues limit the extent to which collaboration is feasible and impact on how benefits in such scenarios are distributed.

The research also highlighted the organisational inhibitors such as how the different cultures of organisations can result in tensions and lack of trust and how lack of consultation may lead to considerable resistance to change both within and between organisations in the inter-organisational environment. Finally, the research also highlights the difficulties that organisations may have in adapting their working practices to reflect and support the collaborative nature of relationships supported by e-commerce.

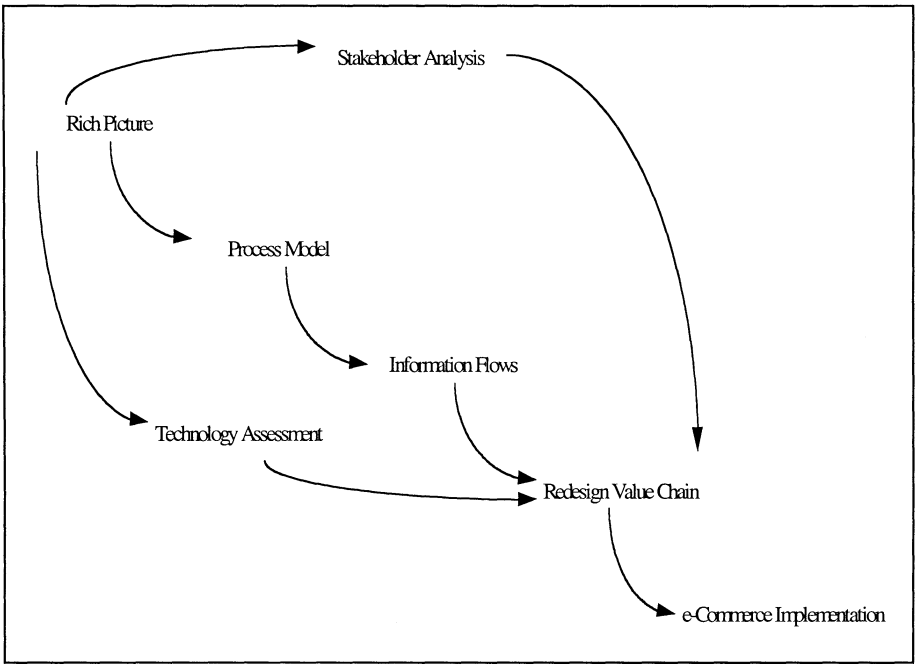

Figure 6. Roadmap

A suggested roadmap is outlined in figure 6 but this is not intended to be prescriptive and is intentionally eclectic in the variation of approaches. The authors believe that the methods used in the case study have generic validity independent of the specific technology employed. Whether the implementation is traditional EDI, internet based EDI or other variations via B2B exchanges, capturing the spectrum of inter related issues concerned with an e-commerce implementation requires a rigorous and inclusive analysis. It is vital to ensure an understanding not only of the capability of the underlying technology but the impact of its deployment on supply chain processes, the optimisation of data flows to enable good information management and the opportunities for redesigning the extended value chain. In parallel with this activity is the requirement to accommodate stakeholder concerns and to understand how e-commerce can influence the organisation's culture and business practices.

REFERENCES

Alt, R., Osterle,H., Reichnayer, C. & Zurmuhlen, R., (1999), Business Networking in the Swatch Group, International Journal of Electronic Commerce & Business Media, 9 (3), pp 169-174

Baldi, S. & Borgman, H.P. (2001), Consortium-based B2B e-Marketplaces - A Case Study in the Automotive Industry, *Proceedings of Fourteenth Bled Electronic Commerce Conference*, Bled, Slovenia, June 26-26, Volume 1, pp. 591-615

Bovet, D. & Martha, J., (2000), *Value Nets: Breaking The Supply Chain To Unlock Hidden Profits*, Wiley

Bressler, S. E. & Grantham, C.E., (2000) *Communities Of Commerce*, McGraw Hill,

Burgess, L. and Cooper, J. (1998), Quality of service in the electronic supply chain: the role of the internet in marketing strategy. *Proceedings of Eleventh International Bled Electronic Commerce Conference.*

Butler Group (2001), E-Supply Chain: Modelling The Supply Chain in the New Market Economies, Concept Report Volume 1, Butler Direct Limited

Chan, S. & Davis, R.V. (2000), Partnering On Extranets for Strategic Advantage, Journal of Information Systems Management, Winter 2000, pp. 58-64

Chan, C. and Swatman, P.M.C, (1998), EDI implementation: A broader perspective. *Proceedings of Eleventh International Bled Electronic Commerce Conference.*

Checkland P. & Scholes J. (1990), *Soft Systems Methodology In Action*, Wiley, Chichester

Donington, J.H. & Hall, D. (1994), The EDI Report, Published by Unicom Consultancy

Friedman, T.H., (2000), SupplyWebExchange: The Changing Landscape Of The Retail Supply Chain, *Retail Automation, 20(5)*, September-October

Glick, B. (2002), Forum Promotes On Line Trade, *Computing*, 9th May 2002 p.8

Goodwin.,W. (1998), Paperless billing for Sainsbury's. *Computer Weekly*, 26th November

Harris, B. & Parfett, M.(eds), (1996), *The Electronic Commerce Handbook, NCC*

Kalakota, R. & Whinston, A.B., (1997), *Electronic Commerce: A Manager's Guide*, Addison Wesley Publishing

Mathieson, S., (2000), Tesco's Retail Exchange Pays Rapidly For Itself, Computing, 16th November 2000, p.10

Mercer Management Consulting Report, (2000), *Beyond The Exchange: Promising Business Models For The Next Round Of B2B Commerce*, http://www.nmm.com/documents/B2B_comm_v5.pdf

O'Conner, J. and Galvin, E. (1998), *Creating Value Through eCommerce.* London: FT Pitman Publishing

Poirier,C.C. & Bauer, M.J. (2000), *E-Supply Chain*, Berrett-Koehler Publishers

Porter, M. E.., (1985), Competitive Advantage, New York, The Free Press,

Roberts, R. and Mackay, M., (1998), IT supporting supplier relationships: The role of electronic commerce. *European Journal of Purchasing & Supply Management 4 (1998), Elsevier Science Ltd.*

Roberts, R. & Thomas, G. A., (2000), Collaberative Approach to Implementing an Extranet in the Retail environment: A Case Study. *Proceedings of Eleventh International Bled Electronic Commerce Conference.*

Senn, J.A. (1996), Capitalising On Electronic Commerce - The Role of the Internet in Electronic Markets, *Information Systems Management*, 13(3), pp. 15-24

Sokol, P.K., (1995), *From EDI to Electronic Commerce: A Business Initiative.* New York: McGraw Hill Inc

Swatman, P.M.C. and Fowler, D.C., (1994), A model of EDI integration and strategic business reengineering. *The Journal of Strategic Information Systems (incorporating International Information Systems)* - Butterworth-Heinemann Ltd

Tang, J.E., Shee, D. Y. & Tang, T., (2001), A conceptual model for interactive buyer-supplier relationship in electronic commerce, *International Journal of Information Management*, 21, pp. 49-68

Taylor, D & Berg, T., (1995), The Business Value Of Electronic Commerce, *Strategic Analysis Report R-617-121*, Gartner Group, September

Threlkel M.S. & Kavan, C.B., (1999), From traditional EDI to internet -based EDI: managerial considerations, Journal of Information Technology, 14, pp. 347-360

Tung, L., Whye, B.Y.H. & Chin,E., (2001), The Role of Trust in Business-to-Business Electronic Commerce, *Proceedings of Fourteenth Bled Electronic Commerce Conference*, Bled, Slovenia, June 25-26, Volume 1, pp. 19-40.