

Exploring the Barriers to Business-to-Business E-Commerce : an intermediary stakeholder's perspective.

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Abstract

This paper reports a case study of a non-profit co-operative which acts as an intermediary between small builder's merchants and large suppliers. An investigation of the organisation's business model, processes and practices derived from interviews with the IT manager and direct observation suggest that the business is well placed to exploit business-to-business (B2B) e-commerce. However, the business has made little progress towards implementing a B2B e-commerce site. Consideration of the positioning of the three stakeholders identified in the trading relationship suggests that it may be perceptions of potential benefits, and how they align with business needs and practice, that are blocking the uptake of web based activity. It is suggested that Actor-Network Theory might provide a suitable framework for explicitly identifying important issues that are delaying the uptake of B2B e-commerce in this context.

Introduction

Business to Business e-commerce activity has been shown to provide greater benefits than Business to Customer dealing. It is well established that B2B and its predecessor, EDI can provide competitive advantage (Galliers et al.,1995). The internet has given rise to models where intermediary companies can offer services to other companies; however this theoretical potential is not always realised in the real world. Many larger organisations have taken up e-commerce, not so with smaller companies; these smaller companies need to recognise the benefits that may be available to them. It has been shown that three things are necessary for SME's to adopt internet based trading:

1. The company needs to clearly see the potential benefits.
2. The company must be organised so as to be able to take advantage of these benefits.
3. External pressure or influence may be required . (Mehrtens et al. 2001)

It remains true that even where the appropriate technology is available and affordable the uptake is low. This paper looks at a business, The National Merchant Buyers Society (NMBS), which, as an intermediary, appears to be well placed to take advantage of the technology and promote its use amongst its customers; preliminary investigation however suggests that this potential is not being fully realised.

Methodology

The case study as described is derived from a number of interviews with the IT manager of NMBS over a period of months, analysis of current web based materials and physical business documents. The current work processes were observed and from these a model of current business procedures was derived.

In their refined model for Information systems strategy (ISS) for SMEs Levy and Powell (2000) state:

“ The business environment part of the framework encompasses industry awareness and an understanding of the firm’s competitive position together with the vision of the owner.”

An investigation of NMBS annual conference proceedings’ available from the company website gives an insight into these issues

The Business

“Members are able to order direct from any NMBS approved supplier eliminating the need for a direct account. Being an industrial provident society only NMBS running costs are retained, all other monies are returned to the membership via enhanced terms....”

NMBS(2003)

The National Merchant Buying Society (NMBS) is a co-operative with an elected board of members. It acts as an intermediary between groups of members (Builders merchants) and materials suppliers. By acting as a group the members can agree preferential prices with the suppliers. Invoices are aggregated and administered by NMBS. Members invoices are passed on monthly and suppliers are paid directly by NMBS. The prime activity of the co-operative is this processing of small orders on behalf of member; the society also provides an up to date catalogue from which members choose their materials and there are various social events organised throughout the year.

Description of Current Business Processes

“Since the merger of NMBS and GCM, last year, the enlarged Buying Society processes over 2 million accounting transactions per year and with only 60% received by EDI, it is the dedicated personnel that keep the administration side of NMBS running smoothly. The recent implementation of new scanning software has enabled us to hold copies of all manual invoices on disk. This not only dramatically cuts down on storage but also enables us to work more efficiently, despite the increase in volume, especially when it comes to providing copy invoices. NMBS employs over 60 people, with over half of those people dedicated to the accounting procedure somewhere along the line, it is the obvious focus of the business and indicates that NMBS is centred on maintaining a strong financial base.”

Managing Director Chris Hayward
NMBS(2003)

The Current Materials ordering process can be summarised as:

The customer (a builder’s merchant, an NMBS member) selects items required from a materials catalogue, printed or on-line version. The materials are then ordered directly from the supplier (manufacturer). Invoices are sent to NMBS, in the NMBS post room invoices are separated from any credit notes and batches are prepared – copies of invoices or credit notes are posted out to the members. Invoice/credit note details are entered onto the office system and an overnight batch update is carried out. Suppliers may provide details of transactions via an EDI link, this information is called down and merged with the overnight batch update. An audit report is run to check that details are correct and copies of the transaction are stored (currently paper documents are scanned and stored electronically; this reduces the volume of physical documents stored). All confirmed details are passed to the sales and purchase ledgers. Sales and Purchase invoices and statements are prepared and posted out appropriately.

The volume of this activity is indicated by the following;

“... With between one and two thousand mailings leaving NMBS everyday it really is a hive of activity in the NMBS Postal Department. The implementation of a New BTA Print Machine allows us to process and send Members their invoices, credits and statements faster and more efficiently, with the added option of emailing these documents direct to Members who request so.....

Managing Director Chris Hayward
NMBS(2003)

In 2001 the ‘e-GO’ initiative was introduced, this was an e-commerce solution to reduce costs associated with the processing of orders, invoices and credits. Phase 1 was developing the electronic receipt of invoices and credits from suppliers (60% received electronically by May 2002). Phase 2 is the proposal to allow members to interact with a secure website to receive invoices and credits. It was recognised that not all members would want to fully embrace electronic trading an intermediary stage,

e-GO PLUS, was introduced in March 2002. This enabled members, if they wished, to receive NMBS documents by email or fax, however this was only possible with invoices and credits which were sent electronically by the supplier, paper based documents continued to be posted on as before.

Current technical support can be summarised as:

- The EDI initiative (e-GO)
- Scanning of paper invoices to allow efficient electronic storage of documents
- Offering electronic contact with members, however there is low uptake of this.

Suggestions for what a new B2B environment might offer were derived from discussions with the IT manager at NMBS – this produced a wish list including items such as:

- Advance notice of order placement, currently information about orders only becomes known to NMBS when invoices arrive from the suppliers because orders although chosen from the NMBS catalogue are placed directly with the supplier. If NMBS was positioned earlier in the ordering/deliver/payment cycle there may be opportunities to identify purchasing trends and negotiate spot deals
- On line account viewing would allow the member to view the status of their account with NMBS at anytime, rather than the monthly paper-based updates.
- Members receiving invoices on-line could reduce postal delays and allow for further electronically based activity such as account payment on-line.
- A dynamic, on-line catalogue is easier to maintain and update than paper based versions, the current catalogue is viewable on-line but does not allow for direct order placement from the catalogue
- Development of full business portal, become ISP provider to members – a total business solution offering a 'safe' web based trading environment.

So why is the company not being able to move towards these aims?

We would suggest that the current process contains within it elements of an evolutionary development toward a more electronic approach, with increasing potential to become web-based. What was originally a totally paper-based organisation has evolved its processes to being more mixed electronic and paper. However it should be noted that the organisation is still dominated by a large post room, containing individual pigeon holes for each member.

Firstly, the incorporation of EDI provides the initial step in an evolution towards e-commerce. As part of the origination e-Go initiative, The EDI link employs an external Value-Added Supplier, located in Amsterdam. Over 100 suppliers were prepared to provide electronic invoices, accounting for 60% of invoices and 75% of turnover. This shifted some of the through-put to EDI, but leaves behind some suppliers, still providing 40% of the invoices by post. For NMBS, the problem remains of how to shift the smaller suppliers to EDI. For the larger suppliers, electronic delivery of invoice may fit with their existing IT based operations, and require little or no implementation overheads. It was in

their interest to co-operate with NMBS's e-Go initiative. For smaller suppliers, technological and cultural barriers remain. NMBS faces the task of identifying means for showing that delivering invoices electronically to NMBS is in member's interests and worthwhile. Hence, the interests of the smaller suppliers must be translated (Latour, 1987) into the interests of NMBS and of the EDI systems, itself an actor in the network.

Secondly, the implementation of a new electronic print machine, which prints invoices, credits and statements, offers the opportunity to send these documents out electronically, in this case via email as well as via paper-based post. For the IT manager, part of his role has centred on persuading members to receive their documents electronically; he has described this as 'evangelising' on behalf of electronic trading. This has proved a difficult task since most of the members are SME's for whom IT may not be a major priority. The technology has been put in place at NMBS to support an evolution towards an electronic system, but its uptake by customers (members) may be inhibited not only by economic issues, such as the cost of new IT systems, but perhaps also by cultural barriers.

Thirdly, the procurement of a document scanner and the employing of staff full time to scan all invoices received through the post into a document system provides a bridge between the input of the post room and a potential electronic system

These small practical steps provide building blocks towards the development of an e-commerce based system.

Stakeholder Analysis

The diagram below, Figure 1, shows the current interactions between the principal stakeholders in the existing relationship.

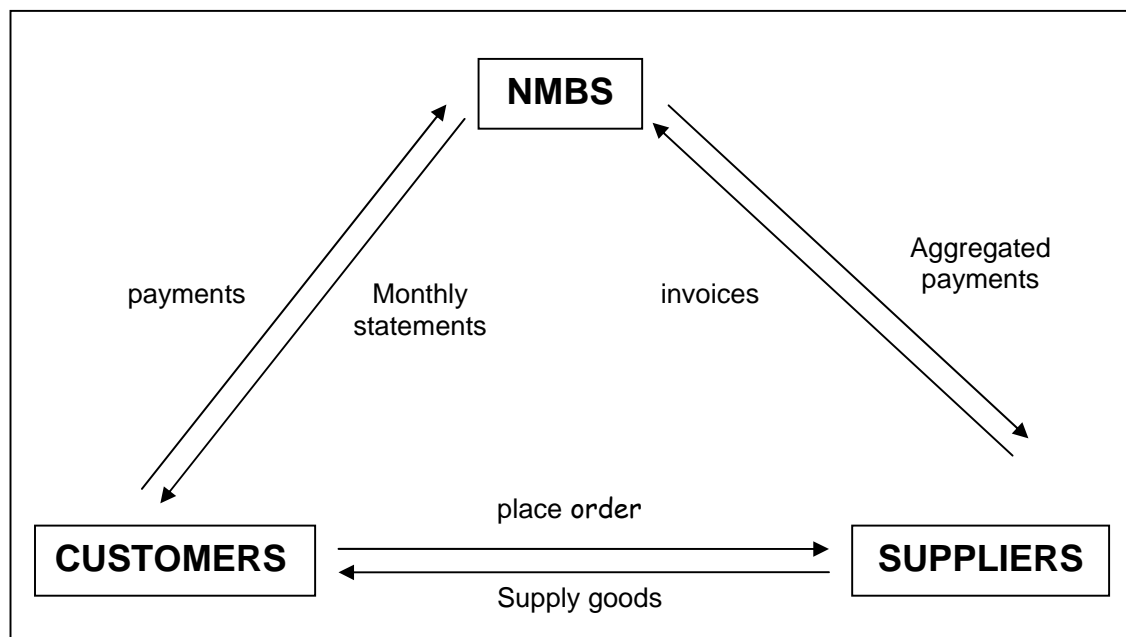


Fig.1 An overview of current interactions between stakeholders

Consider the attitudes of the 3 Stakeholders

1. **NMBS** – Executives are aware of the potential of B2B and are pushing hard. Information from the company website suggests that the MD sees this as a key plank in the company's future:

“NMBS will be offering both Suppliers and Members a comprehensive e-commerce solution that will allow them to reduce the costs associated with the processing of orders, invoices and credits and provide a real benefit to the bottom line.

Phase 1 of that development is the migration of the current EDI invoicing procedures with existing suppliers to a more cost effective internet based solution that will be rolled out across the whole supplier base as soon as possible.

Phase 2/3 will be enabling Members to receive and place orders electronically via the secure NMBS website as well as providing on-line access to your accounts and turnover information.

With NMBS, you won't need to build and maintain a complex e-business system - NMBS will offer a complete business-to-business solution that will require a minimal investment from you in new technology and software.”

NMBS (2003)

Potential benefits for NMBS are:

- Substantial reductions in costs since many processes are manual - for example, inputting of invoices, credit notes and payments and scanning in of invoice.
 - Creating new business opportunities – being ahead in the ordering cycle.
 - Gaining information about what's being bought before invoice arrive, hence able to look at trends, predict sales and look for better deals
 - Substantially strengthen position in market place - may be able to respond faster to changes, also would create lock in of members.
2. **MEMBERS** - (views will need to be confirmed by follow up interviews). Conversation with NMBS' IT manager tell of a perceived resistance to adoption of electronically based trading from members, in contrast with the larger suppliers few members have taken up the current IT initiatives of the society . The IT manager has described his role as partly ‘evangelising’ on behalf of e-commerce. It is recognised that SME’s may have a dilemma when considering investment in IT systems – the acquisition of better understood technology, perhaps the purchase of a new lorry for example, may appear a more attractive option when funds are being dispersed.

Potential Benefits for Members:

Actually issues are less clear here but might include:

- Speedier return of invoices and processing of payments - but clear issue where they might not want this.
 - A better deal negotiated with suppliers.
 - Ability to control account better - same types of benefits as electronic banking.
 - Easier to order electronically by just clicking on required items; the order would then be sent of to supplier, via NMBS accounts system and recorded on member's account so that member can get immediate up-to-date view of what's been order, and what's owed to NMBS.
3. **SUPPLIERS** – (again views will need to be confirmed by follow up interviews). Larger organisations may be culturally and organisationally more prepared for e-commerce, perhaps with dedicated IT teams eager to embrace on-line web activity. Currently 80% of suppliers supply invoices electronically

Potential Benefits for Suppliers

- Extend e-commerce relationship to electronic processing of payments.

CONCLUSION

This paper outlines a case study of an intermediate organisation, NMBS, which links small customers (builders merchants who are members) and suppliers (large businesses, suppliers of building materials). The business processes seem well suited to a B2B Internet application. Such an application would provide an Internet-based platform for members to order small quantities of material through their NMBS accounts and suppliers to receive guaranteed large payments from NMBS covering many small orders.

NMBS is keen to progress such an Internet-based system. The study showed that a paper-based system was evolving towards an electronic system by small steps, including the establishment of a propriety EDI link, the scanning of documents and the offering of electronic invoices e-mailed to members. However, the progression from these small steps to a fully fledged B2B system is slow. There are benefits for all three stakeholder groups. The greatest benefits would accrue to NMBS itself, who would be able to secure their member network, increase their range of business opportunities and protect themselves from competing groups, especially the risk of losing members to these groups. The B2B application would also provide NMBS with a range of new business opportunities including the possibility of becoming a negotiator of spot-deals rather than

being just an intermediary. The B2B would enable NMBS to obtain up-front intelligence on what orders were being placed and not have to wait for physical invoices to arrive.

For suppliers, clear benefits in operational efficiency and integration with their existing systems clearly exist. For members, the benefits of the B2B system lie in improved control of their NMBS accounts and more rapid and flexible ordering. New technologies such as wireless communications may enable remote ordering when, for example, visiting a building site to quote for a materials order.

However, a number of inhibitors exist. For members, the B2B system will enable rapid payment as well as rapid ordering, which may put additional strains on cash flows. The requirements for investment in new technology and the changing internal business processes which must inevitably follow the installation of a new externally-focussed system may also dampen enthusiasm for e-commerce.

There is clearly a gap between the case for adopting B2B in NMBS, which is technically strong and significant from a business point of view, and the resistance expressed by members and some suppliers as reported by the IT manager. The very slow rate of take up is in contrast with the great potential of the application.

Initial interviews suggested that, while the large suppliers have taken well to EDI, and therefore may adopt the B2B system with ease, small suppliers may be resistant to using EDI. Furthermore, there is significant resistance to electronic means of communication amongst the members, all of whom are either small or very small businesses. The efforts by the IT director to promote electronic links and the B2B concept amongst members (who it should be noted also control NMBS as a cooperative) have met with little success. This resistance from the small members is probably the largest barrier that needs to be overcome.

Adoption of Networked Systems

The successful uptake of a B2B system must depend on the interaction between the goals and objectives of the stakeholders. Inhibiting forces will emerge where goals conflict and promoting forces where the goals match and consensus emerges. The adoption of the e-commerce system may depend on the extent of alignment of interests within the relationship between two stakeholders. Thus an evaluation of each relationship (McBride, 2002) may give some guidance as to the likelihood of adoption and may indicate what needs to be done to align those interests and hence encourage adoption.

The overall success of a B2B application will depend on the balance of the forces acting across the stakeholder network. The interaction of these forces creates a dynamic network of information flows. The B2B system will both support these information flows and itself, 'grow' on these information forces. The way these forces interact will determine whether the B2B network embeds itself and the way the benefits are balanced or skewed between stakeholders.

An understanding of the internal goals and agendas of stakeholders and how these are expressed in relationships may help in the understanding of why a B2B system is adopted and what keeps stakeholders actively involved in its usage.

Prescriptive use of actor-network theory to promote a B2B system

For NMBS, the main problem concerns how to gain acceptance and involvement in an electronic trading network. While evaluating internal stakeholders goals and objectives and hence analysing the value and benefits of a relationship, and the additional relational benefits likely to be incurred by using the B2B system provides valuable input, it may not suggest what actions NMBS should take and what concepts and benefits should be emphasised in the marketing and negotiation process.

Actor-Network theory has been shown to be a valuable tool in explaining the adoption of information systems (Bloomfield et al, 1992; Monteiro and Hanseth, 1996; Walsham, 1997). We would suggest that the concepts of actor-network theory may have some value in providing prescriptive framework for promoting B2B adoption.

Identifying the interests of actors in the networks, considering the gap between those interests and the interests of the B2B application, and proposing inscriptions which translate those interests, may provide a basis for a campaign to gain members' support for the B2B system.

Considering the prescriptive use of the concepts of Actor-Network theory raise a number of questions NMBS might ask, including:

- What are the interests of the 'actors' or stakeholders that the organisation wishes to enrol into the network?
- What actions are required to align those 'interests' with those of the network?
- How do we 'translate' the interests of the members into those of the network?
- What 'inscriptions' do we require?
- What are the inhibitors and promoters?
- How do we characterise the relationship between actors, and identify the benefits to each actor within the relationship?
- What actions can be taken to promote 'irreversibility' and lock-in?
- What are the 'black-boxes' within the network? How do we create these 'black boxes'?

Further work, involving interviews and surveys of members and suppliers, will refine the questions which should be asked by NMBS, and create a final questions set whose answers will provide the basis for the development of a rigorous case for establishing a B2B system as the foundations for NMBS's services.

References

Bloomfield,B.P; Coombs,R.; Cooper,D.J. and Rea,D. (1992) Machines and manoeuvres: responsibility accounting and the construction of hospital information systems. *Accounting, Management and Information Technologies*. 2, 197-219.

Galliers,R.D., Swatman,P.M.C., and Swatman,P.A. (1995) Strategic Information Systems Planning: deriving comparative advantage from EDI. *Journal of Information Technology* 10, 149 - 157.

Latour B (1987) *Science in Action*. Open University Press, Milton Keynes

Levy M., Powell P. Information Systems Strategy for small and medium sized enterprises: an organizational perspective. *Journal of Strategic Information Systems* 9 (2000), 63-84

Mehrtens J, Cragg P, Mills A. (2001) A model of Internet adoption by SME's from Elsevier, *Information and Management* 39 (2001) 165-176.

McBride, N (2002) A Relationship based approach to IT Investment Appraisal, UKAIS Conference Proceedings 2002, Page 392-401

Monteiro,E and Hanseth,O (1996) Social shaping of information infrastructure: on being specific about the technology. In Orlikowski,W; Walsham,G; Jones, M.R and De-Gross,J (Eds) *Information Technology and Changes in Organisational Work*. Chapman and Hall, London.

NMBS Website: http://www.nmbs.co.uk/memsup/public_frame.asp Accessed 08/01/03

Walsham, G. (1997) Actor-Network Theory and IS Research: Current status and future prospects. In Lee,A; Liebenau,J and DeGross,J (Eds)*Information systems and qualitative research* Chapman and Hall, London.