Supply Chain Management: An International Journal, Sep 2005 Volume: 10 Issue: 4 Page: 264-271.

Exploring supply chain opportunities in the UK utilities sector and the supporting role of eMarketplaces

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Abstract

Since the privatization of UK Utilities, few studies have examined supply chain management in the sector. This paper investigates the state of development of the supply chain management concept and the role of the emerging Internet-based electronic marketplaces in supporting this. Using a case study method, interviews were conducted with managers in seven UK electricity and water utilities. Areas explored are the firms' supply chain priorities, how eMarketplaces can support their supply chain goals and the barriers to adoption of eBusiness solutions. The research reveal a strong orientation in both the electricity and water industry firms towards controlling cost inputs. Consequently their focus is on managing procurement as the primary supply chain activity. The key barriers to eBusiness adoption identified are the problem of providing genuine benefits to suppliers, and the technical difficulties of marketplace implementation. This is an

exploratory study of the domain and further work in this area needs to focus on how Utilities will develop their supply chain competences and how eBusiness solutions can support them. The research concludes that operators of electronic marketplaces have not yet delivered a convincing case for wider participation in management of the supply chain online. A stronger SCM orientation will need to emerge in Utility firms before that can occur.

Keywords: Private sector organizations; Supply chain management; Electronic commerce; Procurement; United Kingdom

Paper type: Research paper

Introduction

This paper examines the extent of the development of supply chain management (SCM) in UK Utilities firms and the opportunities for extending the SCM concept within the sector. The research reported here focuses specifically on the electricity and water industries. The purpose of the paper is to evaluate the status of supply chain management in these industries, the opportunities for further supply chain integration and the supporting role of eBusiness mechanisms such as electronic marketplaces. This is a preliminary study of the sector and reported here are the results of an initial project carried out with a number of Utilities firms, which will in turn contribute to a wider research study being undertaken into the impact of eBusiness mechanisms in a range of industries.

Background to the UK Utilities sector

The process of privatisation of nationally owned assets began in the 1980s under the Conservative government of the period and the Utilities sector was one of the last in national ownership to be put through a programme of privatisation. This study concentrates on the electricity and water industries, all of whose assets and activities used to be in national ownership and which were privatised from 1989 onwards through stock market flotations. This programme created the concept of competition in these industries for the first time with the objective of

leading to choice for consumers and business users and improving standards of performance. A regulatory structure was put in place to provide a legal framework and to oversee planning, pricing and financial practices in the industries, through bodies such as Ofwat, the water regulator (OFWAT, 2002).

Despite the emergence of a structure of competition in these industries, the EU maintains a regulatory stance towards businesses in the old 'public' sector. For example, the rules for purchasing practice in the sector as a whole are covered under the EU Procurement Directives which detail the obligations public sector organisations must follow in relation to tendering of business and the awarding of contracts to suppliers (Anon., 2002).

As the formerly privatised UK Utilities are subject to regulatory frameworks, much of the academic literature in this area has focused foremost on the resulting strategic components and economics of the sector industries. The principal themes which have been addressed are: competition and regulation (Markou & Waddams Price, 1999; Kunneke, 1999; Waddams Price & Bennett, 1999; Parker, 1999) and power structures/ownership (Newbery, 1998; Morse, 2000). As opportunities for enhancing market share and increasing prices are at best limited, one of the few remaining strategies for Utilities to improve financial performance is cost reduction. Supply chain management has been recognised in many industries as an important area of cost reduction opportunity.

Literature review

Utilities and supply chain management

Supply chain management and its importance as an integrating function have been extensively documented in the literature (Stevens, 1989; Bowersox, 1997; Lambert, Cooper & Pagh, 1998; Christopher, 1998). The focus of much recent supply chain research has been the beneficial effect of supply chain members working together in a co-operative manner in order to improve overall effectiveness and reduce costs as a whole for the supply chain, particularly by process alignment (Christopher & Juettner, 2000; Croxton *et al*, 2001; Hammer, 2001). It is now recognised that at the level of the individual firm, improvements can be made in logistics activities, however it is at the network or supply chain level that many organisations now look for quantum leaps in performance (Christopher, 2000; Kraemer & Dedrick, 2002).

In regard to Utilities, at the operational level, areas which have been examined include industry benchmarking (Parena & Smeets, 2001), BPR (Jacob & Sioshansi, 2002) and asset management (Hoskins *et al,* 1999). In addition, Jennings (1999) has examined issues surrounding corporate planning, whilst prices have been discussed by a number of authors including Branston (2000).

Supply chain management in the Utilities sector and the formerly privatised industries has received relatively little attention. Procurement is the exception here as there have been a number of studies, following UK privatisation, examining the impact of the EU Procurement Directives (Furlong, Lamont & Cox, 1994; Cox & Furlong, 1995; Cox & Furlong, 1997). More relevantly for this study, Cox (1999), Cox, Harris & Parker, (1999), Anderson (2001) and Cox, Lonsdale & Watson (2001) have discussed purchasing and supply management techniques and strategy, noting the improvements which have been made, and still need to be made, in purchasing and supply professionalism. However, the focus of this latter work has been predominantly on *supply management*, as opposed to the broader concept of supply *chain* management, which encompasses *inter alia* materials planning, forecasting, inventory management, production scheduling, warehousing and transport, and reverse logistics. This paper seeks to widen the debate in relation to UK Utilities and to contribute to an understanding of supply chain issues and priorities in the sector.

Supply Chain structures in the Utilities sector

The two industries studied here have distinct and different structures to their supply chains and need to be examined individually.

Electricity

The present day supply chain structure in the electricity sector is illustrated in Figure 1.

(take in Figure 1)

Fuel consists of a number of sources of raw materials and the primary fuel inputs are coal, gas, oil and oil derivatives, nuclear fuel and renewable sources (Sanderson, 1999). Generation is the process which converts the various primary fuels used into electricity. The privatisation programme of the 1990s brought a degree of competition into this segment of the supply chain for the first time when the former monopoly of the Central Electricity Generating Board was divided up, initially between three private firms. Subsequently more competition has appeared in the UK sector as additional generators have entered the market.

The transmission function is the only part of the supply chain which has not been subject to competitive activity and remains under the control of the National Grid. The high costs of maintaining the infrastructure and a guaranteed, safe method of transmission were some of the reasons for keeping this activity in a controlled monopoly (similarities exist here with Railtrack in the UK rail industry). Distribution of electricity is carried out by a number of players including privatised regional distributors, previously known as the Regional Electricity Companies, as well as some of the national generators such as Powergen, who following privatisation, have bought outright parts of the regional distribution network. Distribution involves taking electricity from the transmission system and connecting it to consumers and business users at the point of consumption.

The final link in the chain, *supply*, is effectively the retail activity within the industry. The supply firms buy electricity from the generating companies and provide a service to the end customers. The supply firm is who we deal with as consumers and with whom we have the trading relationship. This may be the regional business in our area of domicile, or equally one of the national or independent operators who have purchased interests in this part of the chain. [1]

It can be seen from this brief overview of the industry that there is today a complex structure of production, distribution and supply, with some firms operating exclusively in one section of the supply chain and others such as Powergen who operate in several segments at once.

This structure of separation in the industry has led to the creation of a non-integrated supply chain, where the product sold has come to resemble a commodity which can be traded on open markets. Indeed some power distributors have experimented with the purchasing of electricity through the reverse auction mechanism, as a means of purchasing at most competitive rates. (Reverse auctions are a means of tendering whereby suppliers are invited by a buyer to bid prices online, in real time, with the winner being the firm offering the lowest price (Emiliani, 2000; Smart & Harrison, 2002)).

[1] Since this research was undertaken, there have been further changes in ownership, particularly in distribution and retail operations, within the electricity sector.

One of the implications is that firms in the sector are less likely to take an end-to-end supply chain approach and will concentrate on maximising their individual power. As stated by Sanderson (1999):

'Rather than looking at a flow of goods and services, and a parallel flow of value, which is almost exclusively within the boundaries of one organisation…… we are now faced with a series of transactions between separate firms operating at one or more of the key functional stages in this supply chain' (p.200)

Water

The UK water industry offers an interesting contrast to the electricity sector as, since privatisation, it has manifested a quite different arrangement of structure and ownership. Despite the de-nationalisation of the assets of the water business, in effect what is now in place are a number of regulated regional monopolies. The role of the water regulator is set out in Section 2 of the Water Industry Act 1991 and includes price reviews, protecting customers, promoting economy and efficiency, facilitating competition and enforcing licences (OFWAT, 2002). The industry is divided into ten regional operating water businesses which offer a full water and sewerage service to consumers in defined geographical areas, plus twelve additional local firms offering water supply only.

Figure 2 illustrates the supply chain in the water industry for the *water and sewerage* companies where it can be seen that there is a much more integrated structure, with all activity being carried out within the one organisation.

(take in Figure 2)

The primary difference between the supply chain in water and most industrial situations, is that the product is subject to little processing or alteration during its lifetime in the chain. Water is both the raw material and the product of final consumption. The role of the supply chain is to add value to the product through the processes of abstraction, storage, treatment and distribution in order that the customer, either private or business, receives the product in a suitable condition for consumption. The flow of value here remains almost exclusively in the hands of one organisation, except where third parties and contractors are utilised to perform specialist functions.

Electronic marketplaces

One element of this research is its interest in the potential role of eBusiness mechanisms and in particular B2B (business to business) electronic marketplaces. Online marketplaces were launched at a prodigious rate between 1998 and 2001, during the short period of the Internet bubble economy. Much has been written about the online marketplace model, its transforming role in business and its potential as a vehicle for achieving industry-wide standards and supply chain integration (Wise & Morrison, 2000; Raisch, 2001; McKinsey/CAPS Research, 2001; Copacino & Dik, 2001). However little empirical evidence has been provided to suggest that those aspirations have been achieved, or whether

indeed they are achievable. From 2001 a sharp shock was delivered as many of the early marketplaces failed to get operations off the ground or were unable to achieve viable revenue streams and so were deserted by their investors. Indeed during 2002 a number of prominent eMarketplace promoters such as Barclays plc and GE decided to disinvest from their projects (O'Connell, 2002). This has not signalled the end of the eMarketplace initiative but those which have survived are faced with difficult decisions about how to shape themselves into viable business propositions (Dodge, 2002). A typology of marketplaces has been developed which suggests three levels of ownership and functionality, usually defined as *Independent*, *Consortia* and *Private* (Krammer *et al*, 2001; Laseter *et al*, 2001; Lawrence, 2001)

In the Utilities sector, a number of independent (or *public*) marketplaces have come into existence, serving the US, European or Asian market. This research project was carried out with the assistance and sponsorship of one of the European marketplaces (the company has requested anonymity). Its Internet marketplace became operational in mid-2000 and provides information and transactional services for Utility companies and other formerly privatised industries. The main activities in the marketplace related to procurement which has been the company's core business, having developed through offering information and support to public sector firms involved in tendering under the auspices of the EU Procurement Directive. The company was interested in which

additional supply chain products and services would be of benefit to Utility firms in the future.

Research methods and objectives

A number of potential research issues were considered and given the lack of research into both supply chain management and eBusiness opportunities in this sector, three research questions were selected:

RQ1: What are the supply chain priorities of Utility firms?
RQ 2: How can an electronic marketplace support the supply chain needs of Utility firms?
RQ 3: What are the barriers to eBusiness adoption in this sector?

The aim of the research was to explore and evaluate how the supply chain operates within each industry sector and the priorities of the participating firms, with a view to identifying services within an electronic marketplace which would meet the needs of participants. The study was targeted at the buying firms who participate in the marketplace (using online procurement services) as these firms were considered to be the principal future customers of the marketplace for supply chain management products.

As this was an exploratory study of a largely under-researched sector where the focus was on a new and developing IT mechanism, the approach taken was to use structured interviews to explore a number of themes with the respondents. Access was obtained to senior managers in several firms participating in the marketplace who were actively involved in eBusiness projects. Three firms were in electricity and four were in water. The subjects discussed included, but were not limited to: supply chain structures and policy, procurement strategy and structure, eBusiness adoption issues, the role of marketplaces and their impact on supply chain relationships. Respondents, who were situated in the Supply Chain, Procurement and IT functions, were interviewed either individually or in groups of two or three (company and manager names have not been included as anonymity was requested). In addition to the structured interview questions, respondents were asked to score nine potential marketplace services on a Likert scale. Where more than one respondent was interviewed, the representatives from the company were asked to agree on a score and return it after the interviews were completed.

The data collected from interviews was initially transcribed and coded and for analysis a number of matrices and arrays were used to tabulate responses using the approach suggested by Miles & Huberman (1994). As more than one firm from each sector was interviewed, a comparison of responses and results could be made in each sector, on a cross-case basis. Similarly, common or contrasting replies could be identified within or between industry sectors. For example the

responses from the electricity industry were examined as a group, followed by those from the water firms. Similarities and differences were noted, then the tables of responses from each sector were compared and contrasted. In this way a picture of each industry was constructed, leading to identification of the issues which were either common to both or which differed between them. The results presented below are structured around the three nominated research questions.

Results and analysis

RQ1

In the electricity industry there is no visible product to be delivered to the end consumer in the form we would normally recognise such as a pallet, container or vehicle unit load. In effect, there is no physical logistics activity at the retail end of the supply chain as power is delivered to users through networks of transformers, switchgear, cabling and metering, although this delivery network (the channel of distribution) requires ongoing investment, construction and maintenance. Most physical logistics activity relates to support of engineers and other specialists working in the field.

In the three electricity firms studied, there was no distinct department operating under the name of supply chain, but each had identifiable logistics and

procurement functions. One of the electricity firms operates its own stores system for controlling inventory whilst the other two have outsourced the logistics activity such as transport and warehousing to third party logistics providers. The primary focus for all three of these organisations is on the acquisition of materials, products and services and consequently they see their supply chain priority as procurement. The procurement objectives in these organisations were also driven by different agendas as in one case the procurement manager reports to Finance and in the other examples to either Operations or Engineering.

By comparison, the water industry supply chain, as illustrated in Figure 2, is controlled from end to end by individual organisations. The water firms operate within strictly defined geographical UK territories but in this case do have a physical product delivered to the end consumer. The structure resembles electricity in that supply chain responsibility is once again fragmented. In one of the firms purchasing and logistics are part of Engineering; in two of them the purchasing function reports to Finance; in only one is there a specific supply chain department which controls all related activities. Interviewees reported that the supply chain priority is the inbound acquisition and movement of externally sourced products with procurement being the key activity.

Outsourcing has been adopted as a solution, similar to electricity, with three of the four water companies having outsourced their stores activity to third parties, who manage inventory levels, transport and delivery of bought-in materials. The

Utility firms interviewed here had elected to keep a limited range of supply chain activities under direct control and in most instances have chosen third parties to run the logistics operations such as warehousing and transport. For example, one water industry executive interviewed suggested *'we should concentrate on our areas of expertise such as product specification and acquisition, as inbound logistics can be managed better by third parties'.* One exception to this view can be seen in the case of GPU Power (one of the participants in this study) which undertook a review of its UK distribution system for emergency service components (Darban & Lewis, 2002). In this case, the firm took the view that control of its stockholding policy and closer co-ordination of inbound materials with suppliers would provide benefits to the business and retained these activities in house.

Analysis of this stage of the interview process revealed a common approach towards the supply chain, in both electricity and water sectors. In all instances except one there is no identifiable supply chain function within the organisation. In industries with a history based on private competition and little regulation – automotive, chemicals, food and beverages - supply chain thinking has become a major influence in the business, having developed from a base in logistics or distribution, and often designed to support the impact of global trading and to obtain greater operational efficiency. The Utility firms examined here are generally UK domestic businesses with a focus on the home market, in many cases within a defined and limited geographical region of the UK. They have not

to date experienced the kind of competitive pressures which have driven, for example, the adoption of lean techniques in certain industries (Womack and Jones, 1996)**.** The operational focus in Utilities is on issues such as waste reduction, yield management and updating of networks and facilities. Consequently these organisations currently see a limited need for the more advanced supply chain tools which have been adopted in other industrial situations.

Cox *et al* (1999) have demonstrated that since privatisation many of the organisations formerly in the public sector have made significant strides forward through more strategic approaches to purchasing and supply. This was necessary as in the days of nationalisation there were few pressures on cost reduction and generally little understanding of advanced supply management techniques. In the intervening years, procurement has remained the key supply chain priority for the Utility sector firms. This finding has important implications for electronic marketplaces and is explored in the next section.

RQ 2

The electronic marketplaces operating in a number of industry sectors are grappling with the question of how to attract both buyers and suppliers into adopting services which move beyond procurement. The earliest eMarketplaces were primarily procurement portals, but were quickly followed by sites seeking to

offer tools for operational management and supply chain integration. Even at the early stage of development of the Internet marketplaces there is already concern that transactional procurement alone will provide insufficient revenue streams to ensure survival for the eMarketplaces (Laseter *et al*, 2001). Some of the consortia marketplaces stated their intention, from very early in their life, to provide a platform for supply chain management across the industry. Their aim was to set common standards, provide common software and support collaborative initiatives both vertically and horizontally in the industry sector. (Examples of those who built their product with these objectives were www.covisint.com and www.cpgmarket.com).

Similarly the project sponsor, whilst having started the eMarketplace as a transactional procurement portal, had its sights on providing a much wider range of services and solutions to its members. One element of this study was to ascertain the potential for delivering supply chain solutions to the buying organisations in the marketplace. Buying firms are the focus of this study as they drive the extent of transactions and use of facilities within the portal. To obtain structured responses, all the firms interviewed were asked to rate a list of features which could be offered in the marketplace, indicating their importance on a Likert scale. The nine services were derived from an analysis of features offered by eMarketplaces from other industries and included two additional services suggested by the sponsor. Further, respondents were invited to suggest additional products or services which might be of interest. These responses were

recorded in the interviews or taken from written replies submitted after the interviews occurred. Table I shows the list of headings and the mean response to each.

(take in Table I)

The service which scored the highest on this scale was payment and reconciliation which is not specifically a supply chain activity. It was included as most eMarketplaces are making a play of the potential for online reconciliation to support the purchasing transactions already in place and thereby complete the transactional cycle for the purchaser. By definition this requires a level of integration with the buyer's back-end systems such as ERP, which the majority of respondents were keen to pursue. Contract management is a procurement service offered to many Utility buyers by the sponsor and most respondents saw a benefit in extending this facility into the marketplace online.

The responses to this list were obtained at the same time as the information was being collected from interviewees on supply chain structures in the sector. During those interviews it became increasingly clear that many of the supply chain services and facilities which have been promoted in other eMarketplaces would be of limited interest to buyers in Utilities. The services which received the lowest scores were: inventory management; supply chain planning tools such as those offered by i2 and Manugistics; reverse logistics and logistics and transport

management. Evidence, presented above, suggests that these will remain areas of low priority for Utilities whilst they see outsourcing of most of their logistics activity as a viable solution. Forecasting was perceived by three of the Utilities as an area for potential improvement, whilst the other four considered it of limited value. This attitude to some extent reflects the reporting structures in the organisations studied, where those who maintain a role in logistics management see a need for better forecasting of future materials flows, whilst procurement departments driven by cost agendas are more usually concerned with achieving the best price for materials bought during the reporting period.

eProcurement solutions (software and applications hosted on the portal) such as automated buying tools and reverse auctions scored higher and a number of buyers were experimenting with eProcurement at the time of the research. Several firms were very cautious in their approach to reverse auctions as a means of purchasing, citing concerns over EU procurement rules and supplier resistance as potential obstacles. However, three of the Utilities interviewed had already begun using auctions and planned to extend them further. Most buyers agreed that auctions would become more prevalent in the industry and it was probably only a matter of time until they were used by all the Utility firms, for at least part of their tendering. Utilities firms have recognised the potential benefits of automating procurement activity, documented amongst others by Aberdeen Group (2001), Croom (2000) and Giunipero & Sawchuk (2000) which can be summarised as follows:

- creating efficiencies in the acquisition of both operating and non-operating goods and services
- transaction cost efficiencies: reducing Purchase Order costs
- reduction of maverick spending
- tighter control of ‘on contract’ spend
- potential price reduction through spend leverage.

The subject which produced a high score and which provoked more discussion during interviews than almost any other was collaborative initiatives. These have been notated *horizontal* as the suggestion was that Utilities firms might find benefit in joint approaches, in specific areas such as tendering, sharing supplier information and exchanging experiences on technology. A few respondents were cautious about this approach, fearing anti-competitive practice, however a number of others saw the opportunity to learn from the experiences of similar businesses and to carry out industry benchmarking on procurement and logistics activities. In one particular example, one of the water Utilities had conducted a successful reverse auction for the provision of on-site services and another of the water companies intended to take a similar approach, having only recently learned of the success of this experiment.

These results reveal that the respondents in the study were unclear on what benefits they could obtain through supply chain-focused applications and virtually

all those interviewed regarded as irrelevant any comparisons with retail or industrial supply chains. This attitude is perhaps unsurprising as it is not uncommon for actors within an industry to claim that theirs is different or unique in some way. It is evident that the sector is not impacted by many of the market and competitive forces which have driven change in other industries, leading to a focus on supply chains as an area for gaining competitive advantage (Christopher & Peck, 2003). However it may overlook the benefits for important operational and engineering activities such as power generation which involve the management of complex installations using vast resources. A more developed supply chain approach may well be relevant when firms are involved for example in the commissioning of new power facilities and other major asset construction projects.

In summary, the priority of the sector is clearly procurement, and purchasing and supply considerations drive their decision making. The conclusion is that there is at present limited potential for an extended range of supply chain services and applications within the online marketplace. The answer to the research question posed above appears to be that online marketplaces in this sector need to:

- deliver a suite of procurement-related services which meet the needs of buyers
- provide a forum for exchanging industry best practice and eBusiness successes

- demonstrate the potential benefits to Utilities of online-supported contract management, forecasting, and inventory management tools.

RQ 3

After the boom period of the late 1990s when electronic marketplaces and eBusiness were proposed by many commentators as necessities which no organisation could afford to ignore, there has been a slump in confidence in the concept, following many well-publicised Internet failures. The rate of adoption of eBusiness in Utilities has been slow as in many other sectors and this study sought to understand the reasons behind it. Respondents who took part in this study very willingly discussed the barriers to eBusiness and were invited to suggest issues for consideration which affect eBusiness adoption and the resultant implications. The issues raised and the response count are summarised in Table II.

(take in Table II)

The interview respondents had little difficulty in identifying adoption issues and barriers to progress as many of them were living with those concerns as part of their daily business. Virtually all of the interviewees were involved in using eMarketplace or eProcurement systems and had experienced a range of frustrations. Within the Utilities sector there is clearly a major issue of IT-

preparedness as several Utility firms are still in the early stages of implementing, or even specifying, ERP systems. Only two of the firms interviewed had fully operational enterprise systems and for the remainder not surprisingly their emphasis is on technical and integration issues, as legacy IT is a hurdle to progress.

Although only mentioned explicitly twice as an adoption issue, an important theme which arose during interviewing was the issue of procurement versus supply chain functionality. Due to the difficulties with legacy systems, integration, user adoption, and proving real benefits, most firms were reluctant to progress beyond eProcurement functionality into the more complex areas of supply chain management. Some typical quotations in this respect were:

‘ we want to walk before we can run…’; ‘Utilities are not yet ready to sign on to some of the new (supply chain) *areas…’; ‘we need to see clear progress on the current issues before we move to the next stage’.*

Two of the water companies advised that they had planned at the outset of their involvement with the marketplace to explore other logistics activities but had put that on hold until the major adoption issues for purchasing users and suppliers had been addressed. The majority of firms were clearly looking for a complete solution in the area of eProcurement before moving into any other areas and this

explains their reluctance, in the Likert scoring exercise, to consider most of the supply chain elements in an eBusiness environment.

The other major concern in this list, which prompted extensive comment by the respondents, is supplier benefits. Four of the firms nominated supplier resistance as an area of regular ongoing discussion and as a critical part of future eBusiness development. It has been shown in some studies on eProcurement that the benefits tend to be in favour of the buyers and that insufficient thought has been given to creating a valid adoption business case for supplying firms (Emiliani, 2000). The buying executives raising this point suggested that the solution was to develop a genuine value proposition for suppliers, which on the whole was still absent. An alternative suggested was that in extreme cases they would simply have to be told to adopt the new eBusiness solutions or be excluded in future.

As a qualification to discussion of research questions 2) and 3), it is recognised that the respondents may have replied to the interview questions through a distorted lens. Most of those interviewed were from Procurement and Logistics functions or IT departments, actively involved in eBusiness implementations. Their focus, driven by their management, is on the delivery of systems which improve operational performance and reduce purchasing costs. The fact that these benefits have not yet been delivered at adequate levels may have prejudiced their view of further involvement and investment in more advanced

applications. In a scenario where a set of fully operational and integrated eProcurement solutions was in place, their attitude towards supply chain applications may have been more positive. Hence the current problems of solution delivery experienced by the eMarketplaces may have slowed their rate of adoption for some time to come.

Summary

This study has demonstrated that in the UK electricity and water industries the short term focus is on procurement and the delivery of viable and sustainable eBusiness solutions which support it. The barriers to progress and to eBusiness adoption have been identified and are not insurmountable. Indeed, there was consensus amongst the firms involved that they need eBusiness initiatives to succeed to support their own objectives within procurement. The position over the potential for supply chain integration in the longer term is less clear. Studies by Cox *at al* (1999) and Harris *et al* (1998) have demonstrated the changes in purchasing and supply professionalism and strategy which have come about in the newly privatised industries. However the Utility firms examined here do not currently see a compelling case for a stronger *supply chain management* culture in their industries. As several pointed out, they are not subject to the forces operating in other industrial sectors such as globalisation, volatile demand, obsolescence and changing consumer trends. Consequently there are few forces

driving the sector towards more advanced supply chain integration, or even the adoption of techniques such as lean production.

This scenario presents a challenge to the eMarketplace operators. Within only two or three years of start-up, the eMarketplace economy is littered with failures, with only a few online ventures having so far proved their ability to survive the slump in confidence in the eBusiness concept. One of the issues driving eBusiness speculation at the outset of eMarketplace development was the focus on leading edge, technically-configured facilities. As a result, eMarketplaces in a range of industries set about an ambitious and far-reaching agenda based on a long term supply chain vision. The problem has been that very little was delivered of real value and that which was delivered had a tendency to not work very well. In almost every sector of eMarketplace development, participant firms have complained of the technology lagging expectations, problems of integration and a lack of a clear value proposition for the participants. Marketplace operators must therefore address how they can best meet the needs of their target customers, profitably. Both a long term and short term view of this issue can be taken and they need to tailor their cloth to address those short and long term needs.

In the short term, users need integrated eProcurement solutions to support their target of creating further cost efficiencies. The adoption of reverse auctions for suitable product segments may assist this process (evidence on this point is mixed with Smart and Harrison (2002) outlining the opportunity for savings, and

Emiliani and Stec (2002) indicating the problems inherent in realising savings). The longer term potential will perhaps depend on a change of culture, with supply chain management and some of its component elements coming to the fore. In the industries examined, the forces of competition and customer orientation are still in their youthful stages. Hence the current focus on procurement and management of inputs may be necessary to give the industries examined here a stable cost base, but moving to the next stage of cost reduction may well require a re-examination of some, or all, of the elements of supply chain management. As and when that proposition becomes a reality, the future of eBusiness initiatives such as eMarketplaces will pivot on their ability to fulfil those needs in the sector and help drive the adoption of more advanced supply chain management practices.

Future research

This paper has reported on an initial, exploratory study of supply chain management and eBusiness in the UK Utility sector - an area where little academic research has been conducted. The direction of supply chain thinking in the medium to long term has not been fully explored and an understanding of where the Utility industries see supply chain management on, for example, a five to ten year horizon needs to be established. The further step in this project will be to analyse and interpret the future needs of sector firms in relation to the broader supply chain functions. That stage of the research will help inform how

eMarketplaces and eBusiness service providers should shape their business to respond to the demands of the sector.

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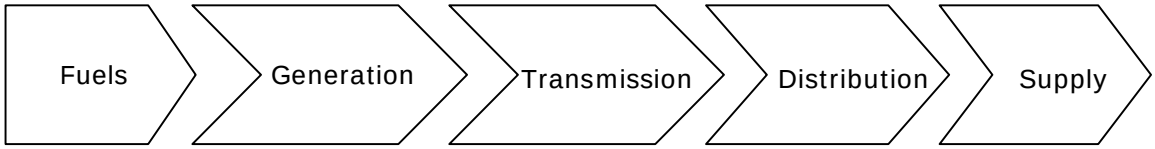
Figure 1: The supply chain for electricity



Source: Adapted from Sanderson (1999)

Figure 2 : The supply chain for water

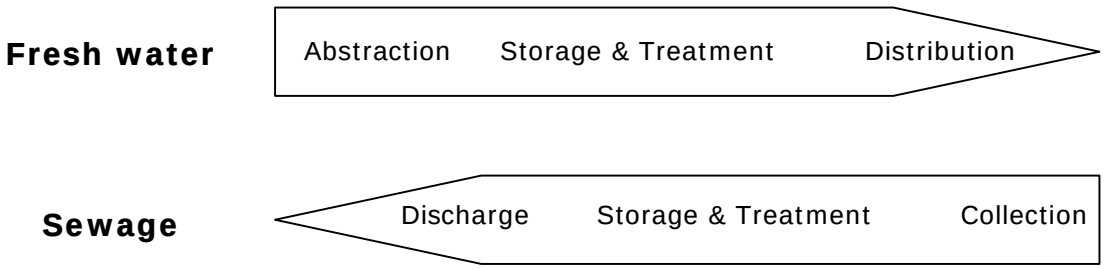


Table I: List of potential marketplace services and scoring on Likert scale

Heading	Likert score
1. Payments & reconciliation	4.2
2. Contract management	3.4
3. Collaborative initiatives (horizontal)	3.3
4. eProcurement; auctions	3.2
5. Forecasting tools	2.5
6. Inventory management	2.0
7. Supply chain planning tools	1.8
8. Logistics/transport management & reporting	1.2
9. Reverse logistics	1.2

- Based on a Likert scale of 1 to 5; 1 = unimportant, 5 = very important
- Results are based on replies from six of the seven firms in the study as one was unable to complete the scoring

Table II: Barriers to eBusiness adoption and implications

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Issue	No. of mentions	Implications
Lack of integration into back-end systems	4	Workflow not optimised; few or no benefits in financial transactions; cost savings delayed
Few incentives for suppliers	4	Supplier resistance or hostility; suppliers need to be more involved at project outset
Concern over unreliability of new IT	3	Users need to experience deliverables first hand
Legacy systems/old IT	3	Difficult to integrate to M/Ps; requires new investment
Some existing procurement methods are adequate e.g. email, EDI	2	Resistance to change; need to clearly prove benefits of new IT
eProcurement needs to be proven before moving to more complexity	2	Reluctance to consider supply chain opportunities; 'softly softly' approach
eProcurement savings have been hyped and are often not achievable	2	Users unconvinced of benefits; need to demonstrate value
Users not ready for new systems	2	Training required before adoption; need to build confidence in solutions available
Lack of funds for new IT investment	2	As above; new projects on hold
eBusiness failures have raised doubts at Board level over benefits	1	Difficult to make a business case for investment
Lack of standards across eMarketplaces	1	May lead to additional costs for users of more than one eMarket
Supplier systems may be better option e.g. RS Components	1	Users can benefit with little investment by the buying firm in eProcurement systems
Utilities sector conservative in its approach	1	Tendency to move slowly; follow rather than lead

Note: These figures do not add up to any relevant total as respondents were free to nominate as many or as few factors as they wished.