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THE EFFECTS OF BUSINESS-TO-BUSINESS RELATIONSHIPS ON ELECTRONIC PROCUREMENT SYSTEMS: AN EXPLORATORY STUDY

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Abstract

For many organisations e-Procurement has become a necessity. Nevertheless, while e-procurement has generated considerable hype the phenomenon is generally under-researched. This paper explores the effects that business-to-business relationships have on e-Procurement systems using a field study of 6 companies. The study classifies business-to-business (B2B) relationships as being adversarial and collaborative, and examines the effects that each have on the electronically supported transaction phases of the procurement lifecycle. The research findings indicate that B2B relationships have most effect on the sourcing, fulfilment, and consumption phases of the procurement cycle

Keywords: Electronic business models, e-Procurement, B2B relationships, field study.

1 INTRODUCTION

Electronic Commerce enables organisations to create improved connections with trading partners and increase global competitiveness (Ngai and Wat, 2002). It has consequently spawned new business models and radically transformed existing ones (Wise and Morrison, 2000; Hayes and Finnegan, 2005). It is generally acknowledged that B2B accounts for the 'largest dollar volume of transactions' in e-Commerce (Albrecht *et al*, 2005). In particular, electronic procurement is changing the nature of purchasing (Telgen, 1998). However, e-Procurement is not a totally new phenomenon. EDI applications have long been utilised by organisations as a foundation for close business relationships and Just In Time (JIT) operations (Kim and Shunk, 2004), and can be described as the first wave of e-Procurement systems (Chaffey, 2002). e-Procurement has made a fundamental impact on the nature of inter-organisational relationships (Roberts and Mackay, 1997). Internet technologies including 'Intranets' and 'Extranets' have been critical for electronic procurement by facilitating integration and coordinating across organisational boundaries (Grover and Malhotra, 1997). Nevertheless, it has been noted that more research is needed on the influence that business-to-business relationships have on the successful use of e-Procurement systems (Knudsen, 2003). In particular, it has been argued that these issues are important as an organisation's supplier base and relationships are a major source of competitive advantage (Dyer and Singh, 1998).

This paper explores the effects that business-to-business relationships have on each of the e-Procurement transaction phases using a field study of 6 companies. The next section presents the theoretical foundation for the study. This is followed by an examination of the research methodology utilised. The findings reveal that B2B relationships have most effect on the sourcing, fulfilment, and consumption phases of the procurement cycle.

2 THEORETICAL GROUNDING

E-Procurement can be defined as the "electronic integration and management of all procurement activities including purchase request, authorisation, ordering, delivery and payment between a purchaser and a supplier" (Chaffey, 2002). The more general classifications of the procurement process have been created by authors such as Kalakota and Robinson (2000), Lysons (1996), Fogarty *et al* (1991), and Whitely (2000). These classifications contain three to four stages of procurement and put the "order" or "sale" as the central phase of the process. In a more recent classification, Archer and Yuan (2000) detail a seven-phase procurement process. The phases include (1) information gathering, (2) supplier contact, (3) background review, (4) negotiation (5) fulfilment, (6) consumption, maintenance and disposal, and (7) renewal. Six forms of e-Procurement are described by de Boer *et al.*(2002); (i) electronic-Maintenance Repair and Operations (e-MRO), (ii) web-based Enterprise Resource Planning (ERP), (iii) electronic-sourcing (e-sourcing), (iv) electronic-tendering (e-tendering) (v) electronic-reverse auctioning (e-reverse auctioning) and (vi) electronic-informing (e-informing). Both e-MRO and web-based ERP are built on a web-integrated enterprise resource planning system. The difference between the two is that e-MRO focuses on the procurement of MRO items whereas web-based ERP focuses on direct materials (de Boer *et al,* 2002). Adapted from the work of Kim and Shunk (2004), Table 1 amalgamates the work of a number of researchers to illustrate the phases supported by e-procurement.

Information			Negotiation	Settlement					
Identify Need	Find Sources		Arrange Terms	Purchase					Use, Maintain, Dispose
Search, Select Supplier	Develop Input Specification		Negotiate Terms	Order Input		Monitor Quality			Fix Problems after the Order
Knowledge, Information	Intention, Target Definition		Negotiation, Contracting	Settlement, Execution, Heading					
Recognise Need	Transmit Need	Select Supplier		Issue P.O.	Follow Up	Receive	Audit Invoice	Close Order	
Pre-Contract			Contract	Ordering, Logistics			Settlement		Post Processing
Pre-Trade				Trade					Post-Trade
Information Gathering	**Supplier Contact**	**Background Review**	**Negotiation**	**Fulfilment**			**Consumption, Maintenance and disposal**		**Renewal**

Table 1. Summary of the transaction phases described within the procurement process (Adapted Kim and Shunk, 2004).

It is evident that there are a number of common characteristics of e-Procurement models. First is the nature of the model; buy-side, sell-side or neutral. Buy-side e-Procurement is when there are many suppliers to one buyer and the benefits are more focused towards the buyer. Sell-side e-Procurement is when there are many buyers to one supplier and trading is carried out through the supplier's web site. The last alternative is for the model to have a neutral or third party emphasis where transactions are carried out between many buyers and many suppliers through a neutral web site (Chaffey, 2002). A second characteristic of e-Procurement models is the type of procurement it supports. Types of procurement include centralised, decentralised, systematic, spot, direct and indirect (Kalakota and Robinson, 2000). Centralised procurement is carried out by purchasing professionals making high level decisions on what to procure (Neef, 2001). Decentralised procurement allows employees to order products straight from their own PC (Neef, 2001). It is this type of procurement that needs order approval routes to cut down on maverick purchasing (Neef, 2001). Systematic and spot procurement describe the frequency of procurement activities (Kaplan and Sawhney, 2000; Chaffey, 2002).

Systematic procurement is planned purchasing and occurs on a regular basis where as spot procurement has more of an *ad hoc* nature (Kaplan and Sawhney, 2000; Chaffey, 2002). The next characteristic details whether the model is vertical or horizontal focused. A vertical model is industry specific and focuses on the specific industry practices and tries to solve inefficiencies within the industry (Kalakota and Robinson, 2000; Sawhney, 2000). Horizontal models deal with a service that is common to all industries like human resources or logistics (Kalakota and Robinson, 2000). Table 2 summarises each of the models according to these characteristics.

	Market Focus		Type of Procurement				Buyer/Seller Aggregation			Product Type		
	Buyer/Seller Centric	Neutral	Centralised	Decentralised	Spot	Systematic	One-to-One	One-to-Many	Many-to-Many	Direct	Indirect	Examples
Electronic Auction	√		√		√			√		√	√	AuctionFlowers.com
Electronic Catalogue	√			√		√		√			√	Glencoe.com
Electronic Exchange		√	√		√				√	√	√	RubberNetwork.com
Content Hub		√				√			√	√	√	MROTracker.com
EDI /XML Extranet	√		√			√	√			√		NASA EDI Network

Table 2. Summary of the electronic procurement models

As B2B electronic commerce supports both hierarchical and market structures (cf. Clemons and Row, 1988) with some organisations using a reduced supply base (cf. St. John and Heriot, 1993), buyer-supplier relationships become very important in relation to e-Procurement. The traditional way of classifying buyer-supplier relationships has been as either adversarial or collaborative (Gules and Burgess, 1998). However, other classifications of inter-organisational relationships (e.g. Finnegan *et al*, 2003) suggest that relationships can be classified along a continuum. Whether viewed as a dichotomy or the opposite end of a continuum, it is clear that adversarial and collaborative relationships have different characteristics (see Table 3).

	Adversarial	**Collaborative**
Duration	Short-term	Long-term
Communication	Very little, just enough for the transaction	Complex, two way sharing
Transferability (switch parties)	Completely Transferable	Extremely difficult to transfer
Management Support	Low	Extensive, sincere
Attitude	Soley profit focus	Open, trusting, cooperative
Visibility	Low	High
Planning and Goals	Individual, short term	Joint, Long-term
Benefits and Risks	Individual, short term	Shared, mutual
Problem Solving	Power driven	Mutual, judicious

Table 3. Summary of Adversarial and collaborative relationships (Adapted from Maloni and Benton, 1997).

The adversarial model includes attributes such as tough negotiation, short-term contracts and multiple sourcing (Matthyssens and Van den Bulte, 1994; Maloni and Benton, 1997). Early research inclined to underline the importance of adversarial or arms-length relationships as the 'tried and tested' way of doing business (Hoyt and Huq, 2000). Such research, based on the principles of Transaction Cost Theory (Williamson, 1979), provided a foundation for explaining buyer-supplier governance

mechanisms into the early 1990's (Teece, 1992) The collaborative model, building on the ideas of Kauffman (1966) and Henderson (1990) has attributes that include cooperation, mutual benefit and trust. Strategies such as cross-functional team decision-making, supply base rationalisation, and long-term contracts are categorised as collaborative (Womack *et al,* 1990; Maloni and Benton, 1997). Advantages of collaborative relationships in a B2B environment include a small supplier base which leads to savings in quality inspection costs and better integration of design efforts (Ellram and Cooper, 1990).

It is evident that the organisational trend is moving away from the adversarial type relationship to the more collaborative model (Gules and Burgess, 1998). The trend is visible in purchasing literature with people such as Ellram (1991), Landerous *et al.* (1995), Ellram and Hendrick (1995), Stuart (1993), and Graham *et al.* (1994) all promoting buyer-supplier partnerships. But despite all the advantages of collaborative relationships, research has shown that 50% of companies use adversarial methods in their business relationships (Mariotti, 1999). The fact is that B2B relationships based on trust and collaboration are often counter-intuitive to the ways of doing business (Hoy and Huq, 2000) and approximately one third of strategic alliances between organisations fail with the biggest reason for their failure being trust (Sherman, 1992). Despite this, research on the effects of B2B relationships on e-procurement is lacking (Knudsen, 2003).

3 RESEARCH METHOD

The objective of this study was to empirically investigate the effect that B2B relationships have on e-Procurement. The study was categorised as exploratory due to the scarcity of empirical work in the area, the focus on discovery, and the aim of theory building. Marshall and Rossman (1989) propose that either a case study or field study research methodology can be used in exploratory research. The researchers decided that a field study would be most appropriate for this study as it would facilitate the collection of data from a larger number of organisations, and would form the basis for more focused research at a later stage. This approach is in line with the thinking of Galliers (1992). Field studies are field-oriented, cross-sectional case studies that focus on gathering qualitative, anecdotal observations (McGrath, 1979) in order to measure dependant variables without any attempt to control independent variables (Buckley *et al.*, 1976). The six organisations chosen for study were based on a representation of the different e-procurement models in use. The primary methods were interviews and document analysis.

Semi-structured interviews were conducted with 9 key decision makers in 6 organisations located in Ireland. All interviews were face-to-face and lasted in excess of one hour. The choice of interviewees was based on a number of factors. These were; (i) willingness to co-operate, (ii) involvement in e-procurement, (iii) nature of knowledge, and (iv) seniority. The contact person in each organisation was asked to indicate the most appropriate personnel to speak with regarding e-procurement, and all key personnel were interviewed in each organisation. Those interviewed had both technical and general business backgrounds, and included representatives of both senior and middle level management (Table 4).

Company	**Interviewee**
Fexco International Payments	Project Manager
Hewlett Packard Software Services Centre	Supply Chain Manager
Bayer Diagnostics	Global Sourcing Manger
Lufthansa Airmotive Ireland	Materials Manager, Finance Manager, Commercial Manager
Eircom	e-Procurement Project Manager, Business Analyst
Web Component Trading	Chief Technology Officer

Table 4. Summary of organisations and interviewees.

The interview guide approach as proposed by Patton (1980) was used to conduct the interviews, with the interview data triangulated with data gathered from documentation gathered in each organisation. The data were analysed using decision tree analysis and meta-matrices as recommended by Miles and Huberman (1994). This approach facilitated an exploration of the key issues within each organisation and an analysis of these issues across organisations.

4 FINDINGS

There are three separate Bayer divisions located in Dublin - *Bayer Diagnostics*, Bayer Ltd and Bayer Diagnostics Europe Limited. These divisions manufacture medical diagnostics systems for the major market segments of Self-Testing, Point-of-Care, and Laboratory Testing. In the UK/Ireland region, Bayer is working within the context of their global e-Commerce strategy of focusing on key accounts and distributors. The e-Procurement models used by Bayer included an electronic reverse auction and Extranet. The amount of time saved in sourcing suppliers along with the ability to compare each of the suppliers on a like-to-like basis are the key reasons why Bayer used a reverse auction. Once a supplier is nominated through the Reverse auction they are integrated into Bayers ERP (SAP R/3) platform and Extranet which handles the e-Procurement of the goods from then on.

Lufthansa Technik Airmotive Ireland (LAI) undertakes the Maintenance, Repair and Overhaul of airplane engines. LAI mainly uses a mix of the industry standard EDI system that is integrated into the organisations backend SAP system and an Electronic Exchange called Inventory Locator Services (ILS). This EDI/Extranet system is used by all the Original Equipment Manufacturers (OEM's) and is the prime tool for procuring materials. The Electronic Exchange (ILS) is specifically geared for the MRO of airplanes. ILS is used by over 200 airlines, 700 repair stations, OEMs, Fixed-Base Operators (FBOs), and suppliers from over 78 countries, to buy and sell aircraft parts, equipment and services. MRO-Tracker (Content Hub) is an application that is also used by LAI and concentrates on optimising the information flow on subcontracted parts and the scheduling of overhaul events. This application acts as an electronic clearinghouse for the repair and overhaul logistics of the aviation industry.

Hewlett Packard (HP), the European Software Centre, focuses on three main areas, Software & Services Research and Development, Software Publishing Services and Software Management & e-Business Services. Their main business is the reselling of software licences that grew from a close partnership between HPG and Microsoft. HP calls this system the Software Licensing & Management Solution (SLMS). This SLMS uses an Extranet to automate the procurement and delivery of software - reducing the time, the effort, and the cost of purchasing and managing software. The e-Procurement system offers a choice of either a direct business-to-business or Internet-based purchasing process. Through their Extranet HP makes it possible to maintain tight control over the procurement and delivery of software, as well as reducing administrative costs and simplifying the complexity of managing software.

Web Component Trading (WCT) is an electronic auction that provides its clients with global reach in sourcing component shortages and liquidating excess inventory, ensuring the best prices the market offers. WCT's business lies in the broad technology sector including computer hardware, consumer electronics, telecommunications equipment and electronics companies. Web Component Trading Ltd. uses the Internet to create a central bidding auction that brings together buyers and sellers. This web-based bidding engine allows its clients to buy and sell inventory and at the same time outsource the administration and operations involved in this process.

Eircom uses SAP's Business-to-Business Procurement (BBP) electronic catalogue platform from which it can order all its non-stock items and have them delivered within 24 hours. The system lets employees buy from catalogues. It then sends the order electronically to the vendors, gets the goods delivered and then presents the invoice electronically. The system is hosted by Eircom, is integrated into the back-end ERP system and is used in conjunction with Eircom's corporate purchasing card.

Fexco is one of Ireland's largest private companies operating in the multi-currency business. The e-Procurement system that Fexco International Payments (FIPs) are involved in mainly derives from the buying of foreign currency (in bulk) from financial institutions. Deutche Bank and Allied Irish Bank (AIB) are the two main suppliers of foreign currency to FIPs. Both of the suppliers have different procurement systems that link the organisations with Fexco. AIB's system can be described as the 'business-to-business version of electronic banking'. Deutsche Bank's system is different in that the emphasis is put on the quotation of rates rather than the analysis of transactions. Both of the systems are integrated into Fexco's financial applications with the ability to run in depth reports on a day-to-day basis.

Table 5 summarises the e-Procurement models (see Table 2) and B2B relationships that are evident in each of the organisations. An analysis of the study findings by phase of the e-procurement cycle (see Table 1) is undertaken below.

	Fexco International Payments	**Hewlett Packard Software Services Centre**	**Bayer Diagnostics**	**Lufthansa Airmotive Ireland**	**Eircom**	**Web Component Trading**
E-Procurement Model	Extranet	Extranet	E-Acution /Extranet	Content Hub, Exchange, EDI Extranet	e-Catalogue	E-Auction
B2B Relationships	Collaborative	Collaborative	Collaborative	Collaborative, Adversarial	Collaborative	Adversarial

Table 5. Summary of organisations involved in the study.

4.1 Information Gathering Phase

As shown in Table 1, the information gathering phase is the initial stage where an organisation goes in search for a supplier and 'gets a feel' for the market. The information gathering stage is deemed necessary when there is no established relationship with suppliers. The phase includes an initial procurement requirement definition and the conduct of preliminary market research. When a customer notifies WCT about a need to buy or sell goods, the system immediately sends an email to the other registered member locations alerting them; this gives the customer an immediate base of suppliers or buyers. Within LAI surplus inventory suppliers are used to cut costs, reduce dependence on OEM's and source products that are unavailable from LAI's usual suppliers. When procuring products from these suppliers the ILS procurement system allows LAI to create a substantial list of potential suppliers that can fulfil their requirement. This type of broadcast communication differs from the integrated and direct communication characteristic of collaborative supply relationships such as Eircom, Hewlett Packard and Fexco. Such collaborative relationships studied are long-term, so there is little need for this phase within e-Procurement systems. In comparison, adversarial relationships have a bigger impact on the information-gathering phase of e-procurement systems as there is a need to constantly search for the lowest price in the market. As a result systems-based communication links with adversarial partners are not strong but the audience is much wider than the collaborative relationships.

4.2 Supplier Contact

The second phase, supplier contact, can be defined as the process of communicating with one or more suppliers after they have been deemed suitable. This communication may take the form of Requests for Quotation (RFQ), Requests for Bids (RFB), Requests for Information (RFI) or direct contact with a supplier. Analysis reveals that the relative lack of trust within adversarial relationships is an important factor in the supplier contact phase. Instances highlighted within the WCTBid auction revealed the

need for a communication audit trail between certain organisations due to lack of managerial support and lack of trust; both of which are clear indicators of an adversarial relationship.

Due to the nature of the adversarial relationships within WCTBids auction, the supplier contact phase has become much more visible with the introduction of an audit trail. As described by the CTO, the shortage and surplus market is marred by fraudulent acts. With little or no supervision, personal relationships began to develop between some junior managers and buyers. This resulted in instances where goods were sold at very low prices as a result of the buyer providing 'incentives' to particular managers. Also low trust between the participants in the auction has led to buyers (especially large organisations) wishing to keep their identity anonymous in order to be quoted fairly.

4.3 Background Review

During the background review phase, references for product quality are examined and any requirements for follow-up services including installation, maintenance, and warranty are investigated. Samples may be provided or trials conducted during this phase. Activities during this phase aim to ensure that the comparison of suppliers during negotiation is not distorted by unsuitable suppliers. The study revealed that, for adversarial relationships, the background review is easier to automate due to the relatively small amount of information needed to complete the phase. In comparison, collaborative relationships often need in-depth background reviews, which are very difficult to integrate into e-Procurement systems. From the study it was evident that sourcing a collaborative supplier was more complex than sourcing adversarial suppliers. The reason for this complexity was due to the need to reduce the risk of being 'tied into' an unsuitable partner, resulting in a waste of investment in integrating and establishing shared goals. This risk put extra pressure on the organisations studied to carry out strict sourcing procedures in order to ensure collaborative success. This is clearly shown in the case of LAI and Bayer. Within LAI, the first step in the background review of potential suppliers is to get a quality manual from all suppliers. A quality manual contains all standards that the company produces their products to, and all the company's certifications. The second step is incorporated in a questionnaire that is given to the potential supplier. If LAI's Quality Department approves the result of the questionnaire, LAI then makes a purchase from the supplier on a trial basis. Within the six-month trial, LAI engineers double check every part coming in from the trial supplier. The products must pass a quality inspection and match the description of the product given. If all inspections are clear after six months, the supplier is put on the approved vendor list and integrated into the EDI system. In parallel for Bayer, such scrutiny involves a background review that includes an audit of supplier systems and operations. A supplier visit is also used to find out more about the supplier. According to the Global Sourcing Manager in Bayer a '*gut feeling*' from speaking with a supplier is just as important as cost in making a final decision. The findings show this type of background review cannot be automated. With so much at risk, Bayer needs the comfort of getting a first hand view of their potential suppliers without going through a third party or e-Procurement system.

4.4 Negotiation

The findings suggest that face-to-face contact is needed for negotiating collaborative relationships. It is also evident that suppliers are being forced to reduce their prices through a rigorous negotiation phase in adversarial relationships. However, due to the high value of trust this practice is rarely tolerated in collaborative relationships. Overall, the negotiation phase plays a bigger part in e-Procurement systems for adversarial relationships than collaborative relationships. High transferability translates into the ability to switch suppliers with relative ease. This is facilitated in adversarial relationships, as there is a large base of potential suppliers to choose from. In addition, there is very little integration with suppliers allowing relationships to be discontinued with little cost. The goal of buying organisations in this situation is to leverage this competitiveness to get the best possible price from their suppliers. WCTBid and ILS both leverage the competitive market by facilitating a global reach for 24 hours a day, seven days a week. Also the ability of '*ensuring competitive bidding*' shows

that WCTBid is committed to getting the best price for its customers. The disadvantage of using such a cost-led approach is that suppliers can feel unfairly treated. This can be seen when buyers are trying to source products at very short notice. During these situations it is common practice for suppliers to massively increase the price of the product in retaliation.

In comparison the ability within Eircom to switch suppliers is very low. The small base of potential suppliers and high integration into supplier systems gives Eircom very few options. Also within Eircom there is a lot of *'grand fathering'*. This phrase, used by the Supply Chain Project Manager, captures Eircoms choice to deal with suppliers because they have dealt with them in the past. In fact many of the collaborative relationships involving Eircom have evolved from long-term relationships. As a result, negotiations of new contracts are done in a more traditional way and are handled by face-to-face meetings. Hewlett Packard are in the same situation as Eircom but they are coming from a supplier perspective. According to the Supply Chain Manager in HP, there are very few organisations that can offer the type of software reselling service that HP provides. The Supply Chain Manager in HP also believes that for collaborative relationships *'to be effective you have to specialise and take the long-term view'*. Regarding electronic negotiations he argues that organisations with collaborative relationships should not implement them as they *'are fine for the short-term but they will not keep you in business (for the) long-term'*.

4.5 Fulfilment

The fulfilment phase covers the physical delivery of the service or product as agreed by the contract. Payment usually takes place during this phase, along with other possible activities like training, installation and forecasting future demand. The study revealed that collaborative relationships have a much bigger impact on the fulfilment phase of an e-Procurement system than adversarial relationships. The findings show that the amount of rich information needed to maintain a collaborative relationship affects the fulfilment stage by encouraging closer system integration between the organisations. One of the key characteristics of a collaborative relationship is the shared benefits (see Table 6). It is also evident that e-Procurement systems need to benefit not just one side of the relationship but both sides to maintain a collaborative relationship.

	Eircom	Hewlett Packard	Bayer
Main Organisational Benefit	Reduction in procurement Costs	Ease of software licence maintenance and procurement	Efficient supply of materials
Main Partner Benefit	Improved Procurement Process	Efficient revenue gathering of licence procurement	Strong communication making fulfilment of requirements easier

Table 6. Summary of shared benefits in e-Procurement systems used in collaborative relationships.

4.6 Consumption, Maintenance and Disposal

The findings suggest that for collaborative relationships, the extra functionality gained through electronic procurement is highly utilised. The opposite is true for adversarial relationships where very little of the potential of this phase is exploited. The findings imply that collaborative relationships need the communicational benefits gained through e-Commerce to operate effectively. These benefits include visibility into processes and a degree of flexibility to react to partners' needs. The findings also show that collaborative relationships tend to have a more tailored consumption, maintenance and disposal phase compared to that of adversarial relationships.

For instance, LAI uses MRO-Tracker to report on the quality of repairs done on sub-contracted parts. MRO-Tracker is an application that concentrates on optimising the information flow on subcontracted parts and the scheduling of overhaul events. When LAI has subcontracted parts for repair the MRO-Tracker is employed to follow the work-in-progress. All information concerning the subcontracted parts is updated by the involved parties and is viewed through an Internet site. For instance, LAI may have ten parts of an engine subcontracted for repair. Through MRO-Tracker, LAI know in real time how many of the parts are unfixable and have an up-to-date estimate of when the parts are going to be fixed. This has a knock on effect for LAI as they are able to accurately estimate when the engine will be successfully repaired. In comparison, low communication and low integration make it difficult for adversarial relationships to share information to gain additional benefits or to even tailor the phase to specific needs. Both WCTBid and ILS are not integrated into the backend ERP systems of the companies that use them. Without this link it is difficult to ascertain any in-depth analysis on the products or relationship that are involved in the procurement process.

4.7 Renewal

With the exception of Bayer, the organisations in collaborative relationships tend to stay with their suppliers. This not only affects the renewal phase of the e-Procurement systems implemented by the organisations but also affects the entire system. The high probability of maintaining a long-term relationship between the organisations, make it easier to justify more investment in the e-Procurement systems. The findings of the study also reveal a trend that organisations utilising adversarial relationships switch suppliers after the contract is fulfilled. This takes the organisations back to the information-gathering phase whereas collaborative organisations tend to iterate from the negotiation phase onwards.

5 ANALYSIS AND CONCLUSION

This study utilised an exploratory field study to explore the effects of adversarial and collaborative inter-organisational relationships on e-procurement systems. In meeting this objective, Tables 7 and 8 provide our analysis of how the characteristics of both types of relationships (based on Table 3) affect e-Procurement systems. This analysis reveals that the adversarial type relationships tend to influence the e-Procurement systems more around the sourcing phases (information gathering, supplier contact, background review and negotiation) than the rest of the phases in the procurement lifecycle. Adversarial relationships tend to reduce the amount of integration within e-Procurement systems and have little effect on the fulfilment and consumption phases. This has been attributed to the lack of relationship commitment between adversarial partners and the short-term nature of their interactions. In comparison, the characteristics of collaborative relationships tend to affect the fulfilment and consumption phases more than the rest of the phases. It can be concluded that as collaborative relationships tend to be long-term and loyal in nature, the need for sourcing new partners is very small. This results with very little need for the sourcing phases within the procurement lifecycle to be supported electronically. Furthermore, when an organisation does need to source a collaborative supplier, the process is often too complex to support electronically.

Collaborative Relationship Characteristics	**Effect on Electronic Procurement Systems**
Frequent communication	Strong electronic communication links between collaborative partners like extranets seem to be needed within the procurement systems to sustain the sharing and transfer of information.
Complex Interactions	Within collaborative relationships complex interactions are common especially around the sourcing phases. These interactions are often unfeasible to incorporate into electronic procurement systems.
Low Transferability	As a result of low transferability between partners in a collaborative relationship the amount of negotiation functionality is minimal in electronic procurement systems.
High Trust Levels	With high trust levels between collaborative partners the amount of integration of procurement systems between the partners is also high.
Long-term Interactions	As collaborative relationships tend to last over five years, the emphasis on the procurement system turns to the seamless fulfilment of products between the partners

Table 7. The effects of collaborative relationships on electronic procurement systems

Adversarial Relationship Characteristics	**Effect on Electronic Procurement Systems**
Short-Term Interactions	Little need for integration into the backend of procurement systems or implementation of complex backend systems
Minimal Communication	Minimal communication ensures that the electronic procurement system does not have to deal with complex interactions between the organisations such as, detailed supplier audits or long trial periods.
High Transferability	Large amount of suppliers to choose from and as result, the limited amount of background review available through the procurement systems is sufficient as finding a substitute supplier is relatively easy.
Low Visibility	Low visibility has caused the use of detailed audit trails to be recorded, to ensure that all interactions are compliant with contract regulations and that market participants contribute in a just manner.
Lack of Trust	Lack of trust can affect procurement systems by keeping the participants of suppliers/ buyers within the system anonymous. This additional functionality is a further measure to ensure fair-trading between the participants in the system.
Profit Focus Attitude	Due to high emphasis put on profit focus and cost efficiency a rigorous negotiation platform is needed for an adversarial relationship to operate. The findings suggest that electronic procurement systems functioning in this environment maximise their reach for potential buyers/suppliers to create a highly competitive market where competitive market prices are negotiated.

Table 8. The effects of adversarial relationships on electronic procurement systems

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