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The Applicability of E-Procurement in the UK Public Sector: An Exploratory Analysis

Danny McConnell, Fiona Ellis-Chadwick and Neil F. Doherty.

The Business School, Loughborough University,
Loughborough, Leicestershire LE11 3TU

Mailing Address:

Fiona Ellis-Chadwick
Business School
Loughborough University
Loughborough
Leicestershire
LE11 3TU

Telephone: 0044 (0) 1509 228279

Fax: 0044 (0) 1509 210232

Email: F.E.Ellis-Chadwick@lboro.ac.uk

Mobile: 0044 (0) 7973 635163

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Abstract: *In recent years, interest in e-procurement systems has grown significantly, as commercial organisations have made substantial efficiency gains across the purchasing function through the application of such systems. However, the public sector and in particular government agencies have made relatively little progress towards the adoption of this technology. This research presents an exploratory study, which focuses on the application of e-procurement systems in the public sector. More specifically, the study seeks to explore the readiness of Public Sector organisations in terms of technology, process, people and compliance strategy by adopting an instrumental case study approach. The key findings suggest that the agency in question is not currently in a state of 'readiness' for e-procurement adoption. Additionally, a number of barriers exist that are likely to impede the rate of progress towards successful implementation.*

Key Words: E-procurement; United Kingdom; Public Sector; Government

Introduction

E-procurement technologies are changing the nature of buyers/supplier exchanges as each party has access to more information and subsequently has improved purchasing knowledge. The supply chain is becoming '*leaner*', (Croom, 2001) through the application of digital and in particular Internet-based technologies. Many commercial organisations have reportedly seen significant benefits from the use of e-procurement, such as improved contract compliance, enhanced management information, reduced transaction times and significant cost savings. Public sector organisations are also realising the potential benefits of such technologies e.g., cost and efficiency gains, (Tulip, 2000) and as a result are actively seeking to develop e-procurement capabilities. Moreover, Government agencies can benefit from increased transparency and unhindered exchange of ideas and information with their trading partners. McIvor et al., (2002) suggest '*Internet technologies can exert a very powerful influence in encouraging a free flow of ideas around the organisation, permitting individuals and organisational units to converge and inter-connect*'.

Recently, the Office of Government Commerce, (Spring, 2001) identified that the UK public sector spends over £100billion per annum on bought-in goods and services. Furthermore, the spending of these funds is perceived to be highly disparate and inefficient, as it involves over 400 separate councils buying goods and services on behalf of UK citizens. Therefore, it is envisaged that the adoption of e-procurement systems within the public sector should ultimately reduce costs and deliver efficiencies through the design, development and implementation of new business processes underpinned by modern information technology. Whilst the rationale for government agencies to adopt e-procurement is clear, to date there has been very little empirical investigation. More specifically, little is known about the state *readiness* of

these organisations in terms of the technology, process, people and compliance strategy to successfully deploy e-procurement and ultimately enjoy the benefits of electronic purchasing.

This paper focuses on the significance of e-procurement to the UK Central Government. The key aims of this study are: to identify the key drivers of adoption and benefits of e-procurement within the public sector, to develop a better understanding of the wider impact of electronic purchasing within this sector. The public sector has been slow to respond to the opportunities being created by this technology and as a result there is little work in this area. The paper tackles the limitations of existing research by building a framework from literature, primarily from work focusing on the private sector. The structure of the paper is as follows: context and literature, presentation of the applicability framework, research method, case study findings, summary and conclusions.

Research Context and Literature Review

The starting point of the study is establishing a working definition of e-procurement. Neef,(2001) suggests e-procurement can be defined by the types of purchases being made. He proposed two categories 1) indirect materials - commodities and or services that do not contribute directly to finished goods, 2) direct materials: the-procurement of materials for use in manufacturing or distribution that are “directly” related to the production of finished goods. The significance of this definition is that different types of materials might require different purchasing systems, (Neef, 2001). Reason and Evans, (2000) focused on the methods of e-procurement, which can include auctions, supplier and buyer driven catalogues and horizontal and vertical portals and implies the method varies according to the user base.

As the literature is developing more *amalgamated* definitions have emerged. For example Dai and Kauffman, (2001) concluded that “a typical e-procurement system affects the whole requisition process”. This process theme has been developed further by Pantayiotou *et al.*, (2004) who state “*the procurement process covers a wide spectrum of activity from routine ordering indirect goods, where there is a good fit with automated e-procurement marketplace solutions at one end, through to more complex procurement of out sourced services, where e-procurement can support the integration of entire supply chains and collaboration with partners*”.

The definitions above, whilst comprehensive from a technology and process perspective are lacking in as much as they do not take account of the need to re-engineer the underlying processes before “e-enabling” them and as a result it ignores one of the potentially major inhibitors to the successful implementation of e-procurement: the culture of the people involved in the procurement process. The need for a change in culture can be both internal (e.g. the public sector organisation) or external (e.g. the supplier) and case examples in the private sector have demonstrated how important having the staff *onside* is to the overall success of the adoption of e-procurement, (Jobber, 2004). Moreover, the discussion above also shows that the issue of compliance is largely absent. Compliance is important from both a procedural and a strategic perspective as it acts as validation mechanism of purchasing processes, and data handling.

Based on the research literature reviewed it appears e-procurement is a multi-dimensional application (see Figure 1), which affects and is affected by the following four significant dimensions:

1. **Technology:** refers to the technological solutions which facilitate the delivery of e-procurement, e.g. the software solutions which automate the procurement process as well as the hardware which creates the infrastructure. Mechanism for delivering e-procurement include; electronic data interchange (EDI), e-sourcing, e-tendering, e-MRO and e-informing, e-collaboration, enterprise resource planning (automation of procurement related workflows including auto-faxing, auto-emailing or other forms of messaging directly with suppliers).
2. **Process:** The procurement process includes seven core activities from the identification/specification of the requirement to the analysis of the management information associated with procurement. Neef, (2001) concludes that one of the main reasons for confusion in the marketplace (in relation to e-procurement) is the way that the press is guilty of “*lumping all procurement into a single group, as if all purchasing techniques and commodity groups required the same systems and approach*”. Therefore, in addition to the stages in the process, the type of goods and the purchasing situation are considered as part of the process dimension.
3. **People:** this dimension of the model focuses on individuals, their involvement with the purchasing process, buyer/supplier relations and management of the whole system. More specifically, the organisation and its culture is likely to have to change to benefit from adoption of e-procurement and therefore people, their competencies and capabilities are likely to be a critical influence on the overall success of the adoption and implementation of e-procurement.
4. **Compliance Strategy:** with regulatory requirements is important for government agencies. From an IT perspective, governance and regulatory compliance today is primarily about data protection, information security and the organization's general control environment.

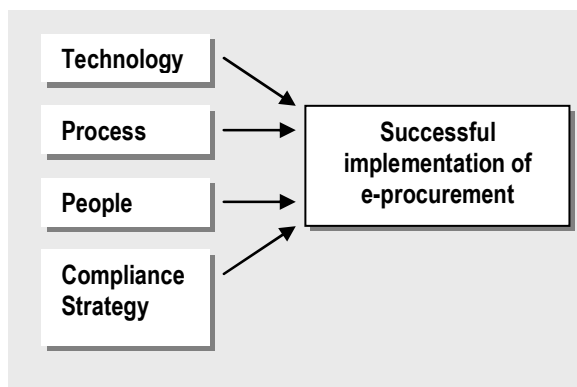


Figure 1 Dimensions of e-procurement Application Framework

Figure 1 suggests that successful implementation of e-procurement is contingent on the *readiness* of the four dimensions outlined above. In order for e-procurement to be

able to deliver potential benefits to an organisation, these four dimensions need to be well-integrated and appropriately tailored to their specific organisational context. The next section examines potential benefits of adoption and considers the types of barriers that might need to be overcome in order to realise these benefits.

Benefits and Barriers of adoption of e-procurement within the Public Sector

The literature on the adoption of e-procurement in the private sector is fairly extensive and suggests various benefits can be derived from its adoption. Presutti (2003) discusses the potential of new technologies to deliver tangible benefits such as greater profitability, cost reduction and real-time collaboration with buying teams across a firm. Other key *benefits* of e-procurement include: **facilitating collaboration**, (Gershon, 1999) and **enhanced supplier relations** through the speed of responsiveness to enquiries and purchasing decisions. **Better supply chain management** facilitated by multiple level interchanges up and down the supply chain, (Neef, 2001; Heyward *et al.*, 2002), **reduced order cycle time** from transmission of the purchase order to its fulfilment, (Butler Group, 2000; Reason & Evans, 2000). **Reduced order costs** and improved pricing through negotiation, (Neef, 2001, Essig & Kaerner, 2001, Butler Group, 2000). **Reduced paperwork**, removing the need for printed versions of exchange documents, (Neef, 2001, Essig & Kaerner, 2001) and **error rates**, non-integration of systems increases the possibility of re-keying errors when transferring data between manual systems, (Butler Group, 2000). **Compliance** – purchasing management is about managing the procurement organisation, or the people in the organisation who are '*amateur buyers*'. By enforcing compliance to negotiated contracts, the level of '*maverick*' buy can be greatly reduced. To support compliance an organisation needs to provide standard, robust, easy-to-follow purchasing processes, which present a line of least resistance to the buyers in the organisation – anything less will dilute the effect, (Neef, 2001, Aberdeen Group, 2001, Butler Group, 2000). **Improved management information / decision-making** the organisation should be able to make better procurement/supplier management decisions, (Neef, 2001, Reason & Evans, 2000, Butler Group, 2000).

Many public institutions and government agencies are very interested in the potential of e-procurement. From a Government perspective, Coulthard and Castleman, (2001) suggest that in addition to realising many operational benefits e-procurement is also a driver of change. In particular, its implementation can assist with the realisation of a range of wider Government initiatives such as: increased efficiency and modernisation of the public sector. However, even though there are many potential benefits and wider strategic gains to be had from the adoption of e-procurement levels of uptake within the public sector remain low. A possible explanation for this could be the many, and potentially significant, barriers to its adoption.

As demonstrated by the examples from the private sector adoption of e-procurement has not always taken place smoothly and many barriers, risks and inhibitors exist. Indeed, Heywood *et al.*, (2002) suggest that firms will struggle to realise all of the potential benefits of e-procurement and “... *it is inevitable that huge sums of money, and considerable effort, will be wasted by some organisations in pursuit of the*

business benefits'. The major barriers likely to be incurred are: **difficulties involved with selecting appropriate e-procurement models** (Heywood et al, 2002) and lack of experience; due to the relative newness of the technology there can be a dearth of in-depth expertise and knowledge. **Security**; many senior managers remain sceptical about the security of trading over the Internet, (Heywood et al., 2002). Lack of or **poor procurement strategy**, organisations need to ensure that their procurement strategy is robust enough to facilitate e-procurement and that there is sufficient funding available to support the strategy. **Supplier non participation**: suppliers are often not keen to build electronic catalogues and to trade electronically, (Vanson Bourne, 2001). **Lack of Technical standards / System Integration** can hinder progress as e-procurement solutions need to interface with back office systems, (Vanson Bourne, 2001). **Organisational Culture** can be a barrier if personnel are not willing to embrace the changes arising from e-procurement, (European Commission, 2000).

This overview of the literature has focused on establishing the meaning of e-procurement in a modern business context and identifying the reasons why an organisation might adopt such systems and barriers likely to impede progress. Given the low uptake of e-procurement in the public sector it is important to understand more about the current state of *readiness* of such organisations to benefit from adoptions of e-procurement technologies. The next section discusses the pilot study designed to test the validity of the framework prior to its wider application.

Methodology

The purpose of the reported pilot study was to test the suggested framework, provide an opportunity for refinement of theory and ultimately to improve knowledge of adoption of e-procurement systems. Furthermore, it provides an opportunity to develop a deeper understanding of the technology adoption in public sector organisations.

The Case Study Approach

The study adopts an *instrumental* case study approach, (Stake, 2000) which creates an opportunity to provide insight into the issues surrounding the adoption of e-procurement systems in Government agencies. The method combines quantitative analysis of the case organisation using document review and semi-structured interviews. The significance of the case institution - Executive Agency¹ within one of the major Central Government Departments in Northern Ireland - is that this study can facilitate understanding of the generic issues facing other Agencies that are either considering, developing or already have e-purchasing systems in place.

¹ Executive Agencies, first established in 1988 are responsible for delivering a more customer-focused approach to individual executive (service delivery) functions within government, leaving parent departments to concentrate on policy development. Examples of such agencies are Health Department Agency, Food Standards Agency (Civil Service, 2006).

The Executive Agency (name has been withheld to comply with confidentiality agreement) has an annual budget of £200m (excluding notional costs) and employs approximately 2500 staff. The annual budget is comprised of approximately £70m relating to staff costs with the remaining £130m operating costs. The organisation provides services to public infrastructure and a significant amount of its expenditure goes on supporting operational activities, maintenance and ongoing development of the infrastructure.

The document review gathered detailed information on expenditure, suppliers and processing activities from the organisation’s finance system and manual procurement processes. Table 1 provides a summary of the specific areas reviewed.

Table 1: Central Government Executive Agency - Quantitative Analysis

Information Collected and Collated	Result
Total expenditure (infrastructure unrelated)	£30m
Number of suppliers	1,990
Average number of invoices processed annually	40,000
Average invoice value	£750
Average expenditure per supplier	£15,100

Table 2 provides more detail information on suppliers. The information reveals potential issues, which suggest there are opportunities to benefit from the introduction of an e-procurement system. Seventeen per cent of invoices processed have a value less than £100 and the administrative effort and costs associated with the processing of an invoice of such a relatively small value is likely to be uneconomical and inefficient. Furthermore, the agency spends less than £1500 per annum with approximately sixty four per cent of its suppliers, which given the bureaucratic nature of the tendering process in the private sector is likely to be placing a huge administrative burden on suppliers. Job enrichment and satisfaction for internal personnel is likely to be low. Additionally, management and maintenance of 1990 suppliers on the organisation’s finance system, where seventy one per cent receive payments of less than £2,500 per annum would appear to be uneconomical and potentially an inefficient use of ICT resources. The average spend and size of invoices suggests the existence of “maverick” or off contract purchasing given that ninety seven per cent of the total expenditure is with twenty nine per cent of the suppliers and is in excess of £2,500 per annum. This is a potential compliance issue. Finally, the reconciliation and supplier management involved with such a large number of suppliers, many of whom have little annual expenditure may give rise to control and quality of service issues.

Table 2: Supplier Analysis

Annual Spend	No. of suppliers	% of Total	Total Spend (£k)	% of Total
Above £2,500	580	29%	£29,205	97%
£1,500 - £2,499	145	7%	£280	1%
£500 - £1,499	390	20%	£360	1%
£100 - £499	540	27%	£140	0%
Less than £100	335	17%	£15	0%
Total	1990		£30,000	

Semi-structured Interviews

Given that lack of knowledge of the application of e-procurement in the public sector, a flexible interview schedule was developed (see Table 3). This allowed for any new issues to be raised by individuals whilst still addressing the issues from the literature. The schedule was used to structure the interviews with key internal and external informants, who included: procurement staff; professional and technical staff; finance staff; and suppliers (6 in total). The interview schedule was given to all informants prior to the interview and handwritten notes were taken during each meeting, which were then validated by the informants for accuracy within 5 days of the interviews taking place.

Table 3: Semi-structured interview schedule

Areas for Discussion	Major Themes
Introduction	<ul style="list-style-type: none"> • Introduction • Purpose of the meeting • Review and validation
Process	<ul style="list-style-type: none"> • Strengths and weaknesses of current processes • Considerations for process improvement
People	<ul style="list-style-type: none"> • Strengths and weaknesses of organisational procurement staff • Strengths and weaknesses of external procurement staff • Experience of procurement staff • Qualifications of procurement staff • Areas for improvement
Technology	<ul style="list-style-type: none"> • Issues with current systems • Considerations for future procurement solutions
Compliance	<ul style="list-style-type: none"> • Issues with current procurement compliance • Areas for improvement

Case Study findings

The findings of the pilot study are now discussed using the framework advocated in Figure 1.

Technology

The technology currently used by the government agency is seemingly not fit for purpose when it comes to e-procurement. Its state of *readiness* from a technology perspective is poor: the existing IT infrastructure is out-dated and there are a very limited range of integrated systems. Historically, central Government has been slow to adopt new technologies, which is hampering this Agency's progress with technology adoption. From the suppliers perspective many of them already have e-procurement technology in place. However, this tends to be the larger suppliers. There is concern from within the Agency that an e-procurement system should be accessible to all suppliers regardless of size. The suppliers also raised concerns about the cost of adopting new technologies and the complexities and implications of re-coding to establish universally applicable standards. Management of technology is also an issue; there appears to be no strong leadership, a lack of senior management support and limited finance available. Whilst the technical and professional staff can see potential benefits in an electronic purchasing system, the finance staff are concerned that there are no incentives or reward systems in place to encourage management of the supplier base. The procurement staff worry about security issues.

Process

From the suppliers perspective the process works well and they like working with this Agency however, larger suppliers with greater experience of purchasing systems stated they would like to see a more proactive approach towards the adoption of e-procurement. Suppliers generally would like to see consolidation of the purchasing system across government agencies, as they feel there could be efficiency gains and more significantly cost savings on both sides. For the internal staff the manual purchasing process is seen to be labour intensive, slow, inflexible and hasn't been changed for over a decade. Strategically, there are more significant issues, as the existing system leads to very inefficient cash flow management and poor analysis due to lack of regular information and encourages 'maverick spend' (finance staff). The procurement staff are frustrated that aggregation of purchasing is not possible as it limits negotiation opportunities.

People

There was a widely held view that current procurement systems are slow and bureaucratic, time consuming, expensive and offer little in terms of job satisfaction (internal staff). The tasks are deemed to be menial and lacking in responsibility by procurement and professional staff. Lack of technical expertise appears to impact both internally and externally: for the suppliers, attention to detail rather than more strategic issues was a problem, which could lead to frustration; for internal staff they are not given the opportunity to take a strategic view as they have not been suitably trained.

Compliance

Manual processing leads to a lack of compliance, which is a view held by all the internal staff interviewed. The main reason is quoted as coding errors and a lack of

check points throughout the year, which create a careless approach. Currently, issues and errors are resolved at mid and end of year audits, when over spending is often revealed.

Summary and Conclusions

Successful implementation of e-procurement at the case agency appears to be unlikely in the near future given the current lack of *readiness* of the organisation. There is evidence of many of the barriers outlined in the literature that are likely to be standing in the way of adoption. Wyld, (2004) suggests slow manual processing, handling error and bureaucracy need to be overcome if e-procurement is to be successful. For this Agency this would mean not only changing processes but also making cultural adjustments. Bartezzaghi & Ronchi, (2004) also claim use of the Internet within purchasing could streamline inefficient procurement processes but this would mean removing the manual paper-based, administrative and bureaucratic elements inherent in traditional procurement systems. Given the apparent lack of strategic direction in this Agency and limited management commitment it is unlikely at this time that any significant progress will be made towards the adoption of e-procurement.

The pilot study has provided an opportunity to test the validity of the framework and the findings have indicated that each of suggested dimensions are evident within the case company and that they are impacting on the Agency's lack of progress towards successful implementation of e-procurement. The next stage of the research is to apply the model to a wider range of government agencies.

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