

Factors Affecting E-Procurement Adoption in Minimizing Risks in the Supply Chain: A Survey of State Corporations in Kenya

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Abstract: *This paper examines the optimization of purchasing through the use of Internet based systems (electronic Procurement). The focus of this paper is the impact of these systems on the supply chain structure and how they are able to change the procurement function to a strategic operating resource for the organization. The empirical research information is based upon a study carried out that analyzed the supply chain strategies being adopted by public organizations. Respondents ranged from 100 to state corporations, experienced users of e-procurement systems to those just starting out on their pilot investigations of the contribution of such systems to purchasing efficiency. A significant result from the study was that whilst a large number of organizations were e-procurement adopters, less than half of them believed that procurement had a strategic function. The case of state corporations is used, as an example, illustrating the ability of state organizations with a strategic capability in procurement, achieved through e-procurement systems, gaining significant organizational benefits via cost and process reductions.*

Keywords: Business-to-Business, E-Business, E-Commerce, E-Procurement, Internet, state corporations, Supply Chain.

1. Introduction

The use of technology for procurement has generated great excitement because of its potential to reduce procurement costs and improve strategic sourcing (de Boer et al., 2002; van Weele, 2002; Subramaniam and Shaw, 2002). Lucking-Reiley and Spulber (2001) argue that the potential cost savings in this area are substantial, and it seems that the potential merit of various electronic procurement forms is largely undisputed (de Boer et al., 2002). Previous research however show that there are still doubts about the real benefits of e-procurement, and that organizations that already have an inter-organizational information system of some kind not yet have decided whether it is an improvement over existing systems or not (Subramaniam and Shaw, 2002).

Even if the conditions for a successful introduction are present, the introduction and implementation of an e-ordering system can be problematic, due to all sorts of political considerations and sensitivities in the field of purchasing within enterprises (van Weele, 2002). Several barriers and problems exist (Chircu and Kauffman, 2000), and they have to be tackled successfully if potential value of the investment will be met (Davern and Kauffman, 2000). One of the largest problems according to empirical data (Arbin, 2003) and research (Davis, 1989; Subramaniam and Shaw, 2002; Reunis et al., 2005) is to get potential users in the organization to adopt and use the e-procurement (e-ordering) system, when ordering products and services. There is growing evidence of unrealized or less than

expected productivity gains due to poor user acceptance and use of new technology (Venkatesh and Speier, 1999).

This research is focused on the public sector in the Kenya. There has been considerable change in practices and processes over the past 11 years with the modernisation of the public sector. Programs such as the Strategic Management Initiative, Management Information Framework and more recently the Benchmarking review have brought the processes of the sector into the public forum.

As a background to these changes, technology has changed over the past 10 years. This change in both the technology and the way it is applied is affecting both the structures and processes of the public sector. Current research in Kenya has failed to look at how services are sourced and procured. Although there is considerable research in the area of Public Administration particularly in the areas of policy, strategy, and programme evaluation, public procurement has not been an area of focused academic research.

Research in procurement has concentrated mainly on the private sector, and although there is now a wide range of research happening in the field of public procurement outside of Kenya, it has tended to look primarily at single dimensions, i.e. the impact of technology on costs or the impact of technology on structure. The research examines the inter-relatedness of three areas, people, process and cost, and the impact that technology has on these areas within the public procurement process. The proposition is that 'the introduction of technology into the procurement process

within the public sector in the Kenya leads to fundamental changes in the processes, organisational structures and costs.

2. Background

In the last 11 years there has been a growing interest in Supply Chain Management. This interest has been primarily focused on the private sector. Supply Chain Management has been used interchangeably with Logistics Management, Materials Management and more recently the emphasis has shifted towards procurement. Perhaps the simplest explanation is to think of a supply chain as having five distinct parts Buy, Make, Store, Move and Sell. Across these five parts are processes that control the supply chain. Information is passed through these various stages. At each stage there are a number of sub-processes which can be defined as processes in their own right. What we then see across a number of definitions (Christopher, 1998, Simchi-Levi et al, 2000, Council of Logistics Management) is a common theme of the supply chain being a process. It is also evident that information related to the process is critical and fundamental for the control, management and understanding of the process. McCormack and Johnson (2001) define a process as '... a specific group of activities and subordinate tasks which results in the performance of a service that is of value'.

3. Adoption

In this paper, I define adoption as making an active contribution towards the implementation or use of the e-procurement tool. Adoption includes using the tool, contributing towards the usage by others, or stimulating the spread of adoption of the tool. This definition implies that an actor can be considered an adopter of the tool, as soon as the actor contributes to a further spread of the tool, without using the tool himself.

In general, adoption models and social network only consider positive influences and exclude the possibility of one actor negatively influencing another when it comes to adoption behavior. Arguably, adoption does not only have a positive dimension, but can also include a negative dimension, i.e. active deviation of the implementation objective. This active resistance can also spread through interactions between actors, causing competing social networks of adopters and non-adopters within an organization.

Some individuals will be inclined to adopt an innovation earlier than others, despite of any management efforts and social influences. Argarwal & Prasad (1998) recognize this human characteristic as the personal dispositional innovativeness (PDI), which describes an individual's willingness to adapt to an innovation, independent of internal or external influences. Goldsmith & Hofacker (1991) show that PDI is domain specific, which suggests inherent differences between for instance the procurement domain and the IT domain. Other traits of a person might influence the PDI or the adoption directly. Some authors stress certain individual factors related to PDI like innovativeness, computer self-efficacy, and experience (Venkatesh & Davis 2000).

4. Public Sector Procurement Requirements

Public procurement is an information-intensive function of government. It has to satisfy requirements for goods, works, systems and services in a timely manner. Furthermore, it has to meet the basic principles of good governance: transparency, accountability and integrity (Wittig, 2003; Callender and Schapper, 2003). It has become obvious that more the procurement process is supported by Internet technology, the easier it should become to handle the manual burdens.

Convention wisdom suggests that government e-Procurement differs from private e-Procurement. Public sector procurement is large and complex, accounting for between twenty and thirty percent of GDP (Thai & Grimm, 2000, COA, 1994), and traditionally attempts to meet many social and political objectives (Tether, 1977). While private sector procurement is practiced under the auspices of each individual firm's governance policies, public sector procurement must operate within a range of regulations and policies established to accomplish desirable social (Tether, 1977) as well as economic (Miami-Dade County, 2000), financial and public audit requirements. A core difference, according to Przymus (2003), is the relationship between the buyer and the seller in each entity - in government the buyer attempts to attract as many sellers as possible to be seen to broaden competition and maximize opportunities for value-for-money whereas in private enterprise buyers may seek to set in place sole supplier arrangements based on a relationship management policy and provided operating risk is deemed to be minimised. Governments are also obliged to disclose purchasing and contracting information to the public, including details about the outcome of government contracting decisions.

e-Procurement solutions are seen as a way to address some of these goals. The transparent nature of the Internet truly makes on-line bidding an effective tool against corruption in government procurement provided there is an absolute requirement for disclosure of all government purchasing and contracting decisions to all interested parties in the society (Talero, 2001). The e-Procurement infrastructure and procedures can facilitate the achievement of the principles of "professionalism, transparency, probity and accountability while maximizing efficiency, effectiveness and flexibility" in the procurement process required by public procurement regulation (DOFA, 2002). e-Procurement has the potential to promote operating efficiency in public sector procurement, and provide significant cost savings (Miami-Dade County, 2000).

5. Barriers to a Successful Implementation of E-Procurement Initiatives

While various governments are encouraging public sector agencies to adopt e-procurement its implementation has not been a smooth transition, and the rate of e-Procurement implementation success has been less than spectacular. "Government e-procurement projects have been notoriously unsuccessful" (Steinberg, 2003). The development and implementation of e-Procurement has not been as easy as some of the solution providers suggested, nor has it brought

the claimed savings. Furthermore, engaging suppliers in the process, especially smaller organizations, is also proving to be difficult given the levels of investment expected of them in their provision of catalogue information to buyers, and marketplaces using different technologies, platforms and business languages (OGC, 2002). Although a number of public sector agencies are actively pursuing e-Procurement, evidence from business press reveals that many of the efforts are not meeting original expectations.

Despite the benefits that can be achieved from a successful e-Procurement initiative implementation in the public sector, the business press has reported a number of failures of e-Procurement initiatives in a number of public sector agencies in the Germany, China and Australia in recent years. The major reasons can be linked to the issues raised in the previous paragraph: complexity, compatibility, an absence of savings and unwillingness of markets to participate. As Heywood et al (2002) observe, "it is by no means certain that all the potential of e-procurement will be realised and it is inevitable that huge sums of money, and considerable effort, will be wasted by some organizations in pursuit of the business benefits".

These views are supported by a number of examples. The US Government's General Services Administration (GSA) had been criticized following recent embarrassing revelations that it was unreliable and error prone (KableNet, 2001). Furthermore, the UK government decided not to extend its pilot e-tendering system across Whitehall (KableNet 2002). In a similar vein, Bell (2003), Doesburg (2003) and Gifford (2003) report that the New Zealand government has reported that its GoProcure e-Procurement system has proved more complex to develop than expected. UK Ministry of Defence is yet to achieve savings three years after its e-Procurement service first started running (KableNet, 2003). According to Government Technology (2002), State of South Carolina abandoned its e-Procurement system in June, 2002 and pilot projects were shut down in 2002 in Massachusetts, Indiana, and Michigan. The Virginia state auditor reported only 1.5% of the state's business was transacted through its state-of-the-art system, which cost \$USD14.9 million (Government Technology, 2003).

On the other hand, there is a view that rumors of e-Procurement's demise have been greatly exaggerated (Harris, 2002). Davila et al. (2002), for example, report that a survey of 168 US public and private sector organizations indicated that e-Procurement technologies will become an important part of supply chain management and that the rate of adoption will accelerate as the adopters share their experiences of success factors and perceptions of low risk. Similarly, Barua et al. (2001) identified e-Procurement as the "most important element of e-business operational excellence for large corporations".

Such success and failure stories imply that there is a need for a much better understanding, and use of e-Procurement implementations in the public sector. Tonkin (2003), provides a succinct summary of this sector's relationship with e-Procurement: "The public sector cannot afford to uncritically follow the latest fads and fashions, it can, however, from a strong base of self knowledge, confidence and with an eye to the future become an innovator in this

field". Furthermore, the sector needs to develop more proactive management control and evaluation techniques to ensure that projects of this nature deliver measurable benefits.

5.1 E-Procurement Success Factors and Propositions

The information systems, supply chain management, e-Commerce/e-Business, and public sector management literatures on Success Factors provide many moderating factors that may affect the selection of appropriate e-Procurement SFs. Since our observations are limited to evaluation/assessment reports of eight major e-Procurement initiatives and six specialized literature on e-Procurement, it will be necessary for us to be very cautious in the presentation of the results. Hence, I will formulate my findings in the form of propositions rather than hypotheses, to be refined by interviews and confirmed by case studies. The resulting hypotheses will then need to be tested by means of a survey research.

5.2 End-user Uptake and Training

As e-Procurement includes new technologies and changes in traditional procurement approaches, the need to train staff in procurement practices and the use of e-procurement tools is very critical to the success of an e-Procurement initiative (WB, 2003) and has a long-established place in the procurement literature (for example, Williams and Smellie, 1985). End-users can realize quick benefits of the system once they understand the operational functionalities (CGEC, 2003). This means that training should be given a high priority, alongside the need for public sector agencies to identify the skills required by all those engaged in procurement (Callender and Matthews, 2000; Queensland Government, 2000; CIPFA, 2002).

As technology alone does not ensure successful adoption, the success of a public sector e-Procurement initiative depends on clients making use of the new process and system. The solution must attract end users to view e-Procurement as the preferred means by which to purchase goods and services (KPMG, 2001). The success of the project also depends on communication to the users (Birks et al., 2001). According to CGEC (2003), the two major obstacles to increasing support among users are their level of technology awareness and acceptance, and their willingness to change long-established internal business processes. As the implementation process unfolds, it can be helpful to take periodic user satisfaction surveys from which it may be possible to identify the possible need for additional training and demonstrate the organization's interest in creating a positive online procurement experience (OSD, 2001).

Proposition 1: The high level of end-user uptake and training is positively associated with the organization and management implementation factor of an e-Procurement initiative.

6. Supplier Adoption

Project success in this case, is closely related to early supplier involvement. It is important to demonstrate the proposed solution to the suppliers and discuss any necessary

changes, issues and concerns such as various options in developing and maintaining supplier catalogues (Birks et al., 2001). According to the OSD (2001), providing opportunities for suppliers to offer their feedback will allow the procurement department to monitor areas for improvement and change in advance. Because many suppliers may be unwilling to conduct business electronically with public sector agencies because they are unclear about the benefits that they will gain, they might see e-Procurement as a means by which public sector agencies will attempt to force down prices (CIPFA, 2002). Suppliers, therefore, should be educated on the e-Procurement benefits that can be provided to them. Suppliers are, of course, an integral part of e-Procurement and should be contacted and consulted as early as possible in the project. The degree to which the success of an e-Procurement initiative can be realized is directly related to the level of e-readiness of suppliers, and appropriate communication with suppliers is therefore important (AOT, 2003).

Proposition 2: The high level of supplier adoption is positively associated with the organization and management implementation factor of an e-Procurement initiative.

7. Compliance with best practice for Project Management

As with other IT project management practices, e-Procurement projects only deliver the planned benefits if a lot of people in the organization make changes to the way they work, which requires championing the project and senior sponsorship. Specifically important in e-Procurement initiatives is the responsibility of ensuring "Buy In" (Birks et al., 2001). Implementation must be delivered in accordance with business case. Birks et al. (2001) suggest the business case processes for e-Procurement should include: identifying drivers, understanding the starting point, benefits, approaches, affordability, risks and benefit realization. Procurement in the public sector has some differences to procurement in the private sector, especially in terms of transparency, accountability and probity. The CIPFA Report (2002) cautions that private sector solutions do not easily adapt to a public sector setting and e-Procurement solutions which work successfully in a private sector setting may fail within the public sector.

Proposition 3: The high level of compliance with best practice/project management is positively associated with the organization and management implementation factor of an e-Procurement initiative.

8. System Integration

Because of the sensitivity of the government data and the legal nature of orders and payments, security of data is fundamental to an e-Procurement system. It is also important for the system to have mechanisms for identifying and authenticating the user who places an order so that the supplier knows it is safe to fulfill the order. Within e-Procurement, Birks et al. (2001) relate the security requirements at the e-Tendering stage to authentication and argue that e-Purchasing systems and processes need protection because they involve a financial transaction that

may be vulnerable to a fraudulent attack. S&A (2003) supports this notion, saying that transactions between different systems need to be exchanged in secure ways with assurances regarding the identities of the buyers and suppliers. In order to encourage buyers and suppliers to engage in e-Procurement it is critical that both parties have confidence in the underlying security infrastructure.

Proposition 4: The high degree of system integration is positively associated with the systems and technology implementation factor of an e-Procurement initiative.

9. Security and Authentication

Because of the sensitivity of the government data and the legal nature of orders and payments, security of data is very critical in e-Procurement systems. It is also important for the system to have mechanisms for identifying and authenticating the user who places an order so that the supplier knows it is safe to fulfill the order. In e-Procurement, Birks et al. (2001) relate the security requirements at the e-Tendering stage to authentication and argue that e-Purchasing systems and processes need protection because they involve a financial transaction and maybe vulnerable to a fraudulent attack. S&A (2003) supports this notion by saying that transactions between different systems need to be exchanged in secure ways with assurances regarding the identities of the buyers and suppliers. In order to encourage buyers and suppliers to engage in e-Procurement it is critical that both parties have confidence in the underlying security infrastructure.

Proposition 5: The high degree of security and authentication is positively associated with the systems and technology implementation factor of an e-Procurement initiative.

10. Re-engineering the Process

E-Procurement should be viewed as an enabling mechanism to make the process of procurement more efficient and effective in terms of cost, time and achievement of value for money in the procurement function (CPIFA, 2002). As the existing procurement practices and

11. Findings

Given the intense publicity surrounding the impact of e-procurement, the findings of the study reflected much of the focus of recent management writing and system vendors' publicity. The four main benefits of e-procurement identified by respondents were:

- 58.8% believed that whilst the main benefits to be gained from adoption of e-procurement would be financial, it was not generally believed that these financial benefits would meet the widely 'hyped' benefits promoted by solutions providers and vendors.
- 45.9% believed that improved information flow was an important benefit of e-procurement adoption.
- 41.2% answered that e-procurement adoption would lead to better internal and external communications for the business.

- 40% saw improvements in planning would be a benefit from e-procurement adoption.

A major concern here is the apparent lack of clear strategic awareness of the implication and benefits of e-procurement. It is certainly clear that procurement is viewed as an administrative process in the majority of respondent organizations, the exception being organizations over Kshs1 billion turnovers. Large organizations typically invest greater resource into their purchasing and procurement function – for such organizations procurement is of major strategic importance. This was underlined in the study by the planned increase in the level of outsourcing by 56.5% of respondents as a direct consequence of e-procurement adoption.

12. Conclusions

The current interest in e-procurement and its applications for the public sector make this a relevant and timely research topic. The models currently being used for looking at procurement have either been focused on the private sector or on public sector bodies outside of Kenya. Given the growth in the use of technology, the proposed changes to the structures of the public sector and the rising cost of managing the sector, it is appropriate that the research be focused on the impact that technology has on People, Process and Cost. This paper has set out the background to the research. It has described the current profile of public sector procurement in Kenya.

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