

# Impact of e-procurement: Experiences from implementation in the UK public sector

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## Abstract

The advent of the Internet as a business systems platform has been a catalyst for major changes in the operation and status of organizational procurement. Early e-procurement literature forecast significant improvements in procurement costs, an improving status of the purchasing function, and changes to the structure of supply markets. Our study seeks to evaluate the validity of these forecasts through the development of a structural model of the 'e-procurement effect'. This model is intended to define the dynamics of the e-procurement process in an organization and provide a foundation for a research stream into the transformational effect of e-procurement deployment.

The article presents the evaluation of e-procurement implementation and operation from an 18-month study of e-procurement deployment across nine UK public sector organizations. The article explores five key themes in e-procurement, namely system specification, implementation management, changes to organizational characteristics, changes in total acquisition costs, and changes to governance structures.

Our analysis suggests that the proposed structural model of the e-procurement effect is broadly applicable and that many of the previous claimed benefits in the literature can be realized. We also contend that an important variable for the success of e-procurement adoption is to address the internal service quality attributes of e-procurement processes—a topic which offers significant scope for future research.

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## 1. Introduction

As noted by Nelson et al. (2001), purchasing accounts for the majority of organizational spending. As such, the advent of web-based electronic procurement has been heralded as a 'revolution' because of its potential to reduce the total cost of acquisition (Croom, 2000; Essig and Arnold, 2001; de Boer et al., 2002; Wyld, 2002; Rai and Tang, 2006). It is also expected to impact on the nature of supplier governance, either reinforcing market-based relationships (Malone et al.,

1989; Barratt and Rosdahl, 2002) or encouraging virtual hierarchies (Brousseau, 1990). Finally, the e-procurement revolution is expected to enhance the status and influence of the purchasing function within organizations (Croom, 2000; Osmonbekov et al., 2002).

Much of the e-procurement literature to date has (naturally) focused on early adopters. The particular areas of interest in these studies relate to system implementation, identifying efficiency effects, speculating the potential changes in supply chain configuration that may occur, and positing that e-procurement will have a major impact on the function by leading to its outsourcing or conversely raising its strategic role.

Using a case-based approach, our study explored the issues relating to implementation and impact of

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e-procurement. The objective was to inform the development of a conceptual structural model of the key decision variables, mediating variables and outcomes from the e-procurement process. In this respect, the paper is a ‘theory in development’, intended to inform not only our on going research (Croom, 2000, 2001, 2005; Croom and Johnston, 2003; Croom and Brandon-Jones, 2005), but also the work of others in the field.

Our study investigated a number of UK public sector e-procurement programmes at both local and national government levels. Since this study originated as a commissioned investigation for a UK government body, all names and some data have been disguised due to issues of confidentiality.

## 2. E-procurement research

Electronic procurement refers to the use of integrated (commonly web-based) communication systems for the conduct of part or all of the purchasing process; a process that may incorporate stages from the initial need identification by users, through search, sourcing, negotiation, ordering, receipt and post-purchase review.

A review of the literature to date identifies five main themes in e-procurement relating to

- changes to total acquisition costs;
- changes to organizational characteristics;
- changes to governance structures;
- system specification; and
- implementation management.

### 2.1. Changes to total acquisition costs

Existing literature has emphasized the important contribution of e-procurement in reducing total purchasing costs. These benefits broadly arise through lower prices from suppliers and reduced costs in the ‘requisition-to-payment’ process (Croom, 2000; de Boer et al., 2002; Wyld, 2002; Kameshwaran and Narahari, 2007; Mishra et al., 2007). Whilst it has been widely contended that e-procurement will have considerable implications for the design of the procurement process, Lancioni et al. (2000) note that the precise nature of these changes remains unclear. Yen and Ng (2003) carried out a case study investigation of textile and apparel e-commerce implementation in Hong Kong. Although primarily interested in the system roll-out process, they provide a useful comparison of pre- and post-e-procurement process performance. Their case evidence gives some useful description of the changes to the procurement process and supports the claims from prior literature that such changes deliver significant efficiencies. They highlight the reduction in costs arising as a result of ‘digitizing’ catalogues, fewer errors in order transmission, reductions in inventory, and minimizing suppliers’ marketing costs.

In the practitioner and general management literature, there is a plethora of anecdotal case evidence to support the view that e-procurement is a far more efficient and reliable method for the requisition-to-payment process than manual or semi-automated processes. However, the speed of adoption and implementation has widely failed to reach the forecasts made by commentators (Wheatley, 2003; Quale, 2005).

### 2.2. Changes to organizational characteristics

The e-procurement literature has also examined the nature of behavioral and relational changes to organizations and their supply chains as a result of adoption. In a study of the motivation of buyers to use the internet as a resource for various elements of the purchasing process, Kennedy and Deeter-Schmelz (2001) conclude that ‘organizational characteristics and organizational influences’ are significant motivators to the use of e-procurement. In other words, the extent to which e-procurement is used and developed is strongly influenced by the general disposition of the organization as a whole. The relationship between user perceptions and the level of compliance has been noted by a number of authors (de Boer et al., 2002; Croom and Johnston, 2003; Interfaces, 2006). The broad argument by these authors is that in order to achieve improvements in performance, internal customer satisfaction should be a key concern in the development, adoption and deployment of e-procurement.

### 2.3. Changes to governance structures

The influence of improved information transmission and user access to the procurement process through the adoption of e-procurement has a significant impact on the configuration and structure of supply chains. Croom (2001) notes that the literature posits two opposing schools of thought on the subject.

On one side, they may increase the tendency towards market transactions as the barriers to participate in electronic transactions diminish. Malone et al. (1989) argue that inter-organizational electronic networks improve co-ordination between firms to reduce the costs of searching for appropriate goods and services—“electronic brokerage effects”. Consequently, they claim that one of the major effects of inter-organizational networks would be a shift from hierarchical to market relationships. Barratt and Rosdahl (2002) argue that ease of search and transparency acts as an advantage to the buyer but may be a disadvantage for the seller, which further reinforces market-based relationships under e-procurement.

On the other side, it has been posited that the proprietary nature of some inter-organizational systems may in fact serve to tie in customers and suppliers into virtual hierarchies (Konsynski and McFarlan, 1990). Brousseau’s (1990) review of 26 inter-organizational networks shows that most serve to reinforce already existing hierarchical

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