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Fractional institutional endeavors and e-procurement in local government

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Abstract

This survey on e-procurement in local government (n=152, response of 55%), suggests severe problems in the rhetoric on the "professional shopper" implicit pushed by institutions. Government has decentralized and pushed reforms that contradicts attempt to make coordinated institutional actions. The most frequent use of e-procurement is within the area of seeking information and receiving support. Also, we have found that the larger municipality (measured by number of citizens and budget), the more likely the municipality is not to seek information through digital channels. In the other aspects of e-procurement (ordering and paying goods and services) we have found only marginal use and no correlation with number of citizens and budget.

1. Introduction

With the introduction of new public management (Ferlie et al. 1996) also came a push for decentralizing budgets and responsibility for implementation of IT. Ironically, the modernization of government laid structural quandaries for the e-procurement rhetoric that evoked during the late 1990s the start of the 21st century. Governments are worldwide seeking ways to implement e-procurement. The World Bank Forum on e-procurement (World Bank 2001), the US E-government bill (US Congress 2001), and the efforts by European Commission promoting e-procurement (European Commission 2001) witness on the policy awareness on e-procurement. Also, actual implementations as the Irish and Australian Governments (Government of Ireland 2003; Australian New South Wales Government 2003), in private companies in Singapore (Kheng and Al-Hawamdeh 2002), the US defense contracting (Scacchi 2001) and the Australian New South Wales e-procurement program witness on e-procurement as an area that has not died along with the dot.com collapse.

Yet, while government in most First World countries at the rhetoric level is moving toward e-procurement, we are in short of knowledge of the actual adoption of e-procurement and trends for how, where and what e-procurement is evolving to. There is a need for seeking a more detailed picture of the organization and profiling of e-procurement (position and profile of e-procurement, the corporate versus delegated procurement) and the content of the tendering process (standardization, specification and approved list) as well as training and capacity issues (ODPM 2001).

With data from local governments in Denmark, this paper investigates the uptake of e-procurement. We are seeking a detailed view of what part of e-procurement is being used (seeking information, ordering, payment, receiving digital goods, and/ or support) and the perceived outcome (financial savings, distributions costs, administrative saving, supplier relations, image and work flow routines). The paper relies on a single survey to municipalities and qualitative data. A self-administrated survey was sent during Spring 2002 to the 275 municipalities. The overall response rate was 55% (n=152). The questionnaires were sent to the overall procurement manager by the end of March 2002 and returned over the following month. Questionnaires returned until mid April were included in the survey.

2. Definition of e-procurement and our research model

We define e-procurement as the application of a span of digital technologies (EDI, Internet technologies, and PDAs) to enable the exchanging partners (within companies and the public sector) smoothing and expanding the front-end and back-office integration of contracting, service, transportation and payment of the products and services through processes, decisions, and transactions. We view the searching, ordering, payment, accounting, transportation and receipt of the good from a given supplier as the procurement *process* (P), whereas the procurement *decision* (D) is the decision to purchase at a given supplier. In some cases this involves that the central procurement officer specifies also the exact good, in other cases the good is not specified. The purchasing of a given good at a given supplier we will label the *procurement transaction* (T). The distinction between P, D and T is essential. A municipality might have a decision that all institutions and all employees have to use a certain suppliers for shopping for paper due a competitive discount on 15%. Once a year the municipality renews the contract. Thus there is no price negotiation during the year, only quantity and time is an issue.

Yet, the variable P gives insight in the complications that might arise when adopting e-procurement. It might be that the goods need to be delivered at another place than the person who ordered it. Also they might prefer it to be shipped with other goods ordered to reduce transportation and order handling costs. Onwards, e-procurement might only encompass some of the elements in the P-variable, namely searching for goods and digital invoicing.

Our definition is in contrast to Mitchell that defines e-procurement by the processes and its intended impacts: "simply defined, e-procurement is the process of electronically purchasing the goods and services needed for an organization's operation. It offers a real-time platform for conducting business while providing a significant opportunity to cut costs, increase organizational effectiveness, and improve customer service" (Mitchell 2000). We would label Mitchell's definition as purely transaction focused.

Thus, e-procurement is not web surfing solely although it indeed encompass catalog shopping, market places, auctions etc. Also, e-procurement includes 2-tier relations, 3rd party marketplaces and other 3-tier business models such as procurement auctions (Kjerstad 2000; Vagstad 2000) in which the buying decision is automated or created entirely by a piece of software (Wigand 1995). At the one end we have the buyers' deliberate choice/ decision at the time of the transaction. Ordinarily order forms at web sites are examples of this. At a more advanced level, the buying transactions are automated primarily in simple transactions, but with some human choices left using various proprietary standards. In our view e-procurement *can* be aligned with enterprise resource planning systems, data mining, knowledge management, and accounting systems. Yet, we do not require e-procurement to be linked with these other IS-systems to qualify as an e-procurement system.

Devadoss, Pan and Huang (2003) point to that government lacks a holistic and comprehensive view when looking towards digitalization of government. They call for attention to include also structural factors. Within the IS literature, it a classical theme whether institutions can and with what success institutions can help diffusing IS (Lai and Guynes 1997; Gregor and Johnston 2001; King et al. 1994). Saunders (1997) highlights that procurement in general has been viewed as a back-office function. Perhaps as a result of this back-office setting, procurement has not had a high level of policy saliency and not been part of the political nature of the budgetary process (Wildawsky 1964). Although there has been various plans and rhetoric on e-procurement, our hypothesis is that there has been a discrepancy between the political rhetoric and the action level (Brunsson 2000).

We focus here on the role of institutions within government itself and thus exclude general developments trends (Thai 2000) and the role of institutions in diffusion of technologies for direct or indirect (non-production oriented) support procurement processes (Gebauer and Segev 2000). Furthermore, we underline that we do not consider issues such as supply risk and profit impacts (Kraljic 1983) although this is a central issue to explore. Instead we focus on intra-government factors by looking at official publications from three levels of institutions and through a survey with the municipalities.

3. Institutions and e-procurement in local government

Three government levels are here highlighted as being important institutions in pursuing e-procurement in local government: EU (primarily DG Information Society), national government (primarily Ministry

of Finance and Ministry of Research and Information Technology), and Local Government Association. At the EU-level, three important general policy documents are the European Initiative on Electronic Commerce (1997), the eEurope Initiative: An Information Society for All (1999), and the more recent initiative from the European Commission on The European e-action plan (2001). Yet, while these policy documents push e-procurement, other parts of EU is pushing removal of internal barriers within Europe. Still other parts are aiming for busting employment in Europe and other parts are trying to boost transparency and hinder national and corruption (Mann, Eckert and Knight 2000). For example, the tendering requirement can hinder the online target goals.

An interview with Jens Mortensen, the director of applications and industries for Oracle Europe, Middle East and Africa on the online market place for the public sector procurement launched in 2002 in Denmark stated that

"the system covers all items below the price threshold for open tenders. In 12 months time, however, the plan is to extend e-procurement to higher value goods. There will be possibilities, say, for a local authority to buy its fire engines online. First, however, some European procurement rules must be changed. The EU will have to take another look at the legal side of it with higher value goods. It has already issued a directive saying that, by 2005 25% of EU payments should be online, and if that is going to be achieved legislation will have to change" (Cablenet 2002).

At the national level, three most important policy documents include the 1996 EDI –action plan (Ministry of Research and Information Technology 1996) and the 2002 action plan for e-commerce (VTU 2002). The initiatives have progressed from defining standards and implementation to focus on innovation of government. Yet, there is lacking of comprehensive initiatives for e-procurement in local government. There have been attempts by the Ministry of Finance to cut the budgets by a sum that correspond to the estimated amount of savings. This created however a massive critique from the chairman of the association of procurement managers, Mr. Carsten Brøndum Jensen:

" The Ministry of Finance has based its analysis of one item in twenty different groups such as pens and envelopes. All goods are marginal. We do not agree that this can be generalized to other groups of goods... Through a very professional procurement behavior in the majority of the municipalities through many years, savings by the billions have been made. Also, tendering processes have been launched for both goods and service; competition has been a key area and use of bargaining power in the tendering process. Thus, public procurement is already in extreme competition through centralized procurement systems. Procurement is already to a large extend professionalized both quantitative and qualitative enabling attractive and broad assortments. " (Our translation, press release, Association of Procurement Managers, May 18 2000).

At the local levels, various initiatives on e-procurement have been launched from the Local Government Association. Going through the list of official publications 2000-2002 from the Association on e-procurement, which is clearly only one indicator, we found 128 publications on e-procurement. The institutional thinking on e-procurement is focused on the ordering process and the related document flow in relation to this, i.e. orders and order confirmation, invoicing, accounting and record keeping, payment (BACS), archiving, and budget control. The type of goods the institutions recommends as suitable for e-procurement in municipalities include office supplies, groceries, books and educational materials, household goods, and fuels (KL 2001). None of the publications were related to the search of goods or the after sales service.

4. Our findings

The total Danish GDP is 986 Billion DKK at factors costs (about 140 Billion EURO). The public sector spends about 288 Billion DKK and redistributes about 70% of the GDP, covering a variety of expenditures (unemployment insurance, housing subsidies, health care, elder care) and income sources (income taxation, corporate tax, consumer tax, import tax, etc.). About two-thirds of the total public expenditures are allocated through the local government (Knudsen, Larsen, and Pedersen 2002). Local governments in charge of the health sector, school, road construction, and elder care are seeing electronic commerce as vital in the area of the procurement and as a means to get electronic documents from citizens and companies. Central government and semi-governmental units such as the postal service and train service are seeing electronic commerce as a means to achieve strategic advances, cost and time reductions and smoothing the communication. The estimate is that goods and services (procurement) amounts to about 100 billion DKK in government of which the 275 municipalities spends about 48 billion on procurement annually.

At the Danish scene there has been a development toward horizontal and vertical e-procurement solution and a mixture of integration modes. Based on the annual turnover, however, they are all either troubled or having a very marginal market share. The portfolio of e-procurement solutions encompass:

- SKI (www.ski.dk)
- DOIP – Gatetrade (www.doip.dk)
- WebIndkøb (KMD) (www.kmd.dk)
- Purchasing consortia
- E-procurement catalogs
- Digital payments and accounting
- Digital exchange of documents related to e-procurement, for example advance delivery notice
- Tendering sites (http://www.udbudsportalen.dk)
- Supplier controlled portals (www.lyreco.dk)

At the demand side, 40% used e-procurement either daily or weekly, only 15% do never use e-procurement in 2002. This is a substantial increase since 1999. Also we found that 6% shopped using the internet in 1999, whereas in year 2002 14% shopped at the internet.

Table 1. Ordering of goods and services via the Internet. 1999 and 2002. Percent (N).

Frequency of ordering goods and services	1999*	2002
Daily	5,7	14,29
Weekly	20,89	27,78
Monthly	23,42	30,95
Annual	8,86	11,11
Never	41,14	15,87
Sum	100%	100%
(N)	(N=158)	(N=126)

Note. *) data from Andersen and Nicolajsen (2000).

Thus, there has been an uptake in the number of municipalities shopping at a frequent basis. Although this figures displayed in Table 1 does not reveal data on the number of transaction or share of budget. The type of goods ordered are in both 1999 and 2002 general office supplies, books, IT-products (hardware and software), conference and training, transportation (travel), and inventory. A rather limited number of the respondents reported that they received good and services in a digital form such as product information, publications, software upgrading, new software programs, and reports.
The second area we found that ordering is the least frequent part of the e-procurement process. Seeking information and receiving the goods and services are more important aspects of e-commerce for both our respondents and their knowledge of what is going on in the rest of the municipality.

Table 2. Frequency of the five dimensions of e-procurement. Respondent self and others in the municipality. Percent (N)

E-procurement dimensions	Respondent self				Others in the municipality			
	Daily/ weekly	Monthly	Never	Sum (N)	Daily/ weekly	Monthly	Never	Sum (N)
Seeking information	55	29	16	100 (150)	62	32	6	100 (124)
Ordering goods/ services	24	43	34	101 (148)	42	42	16	100 (126)
Paying goods/ services	3	10	87	100 (146)	9	15	76	100 (127)
Receiving goods/ services	31	36	33	100 (145)	40	43	17	100 (123)
Receiving support/ service	31	33	35	99 (147)	43	48	9	100 (120)

We tested whether the number of citizens, total budget or budget relative to number of citizens could explain any variation in the respondents use of e-procurement. The outcome of the test did not support any correlation expect in seeking information and in receiving support / service and in the ordering process. Please note that the correlation in these area is negative, hence suggesting that the bigger municipality (measured by number of citizens and budget), the more likely not to seek information through digital channels.

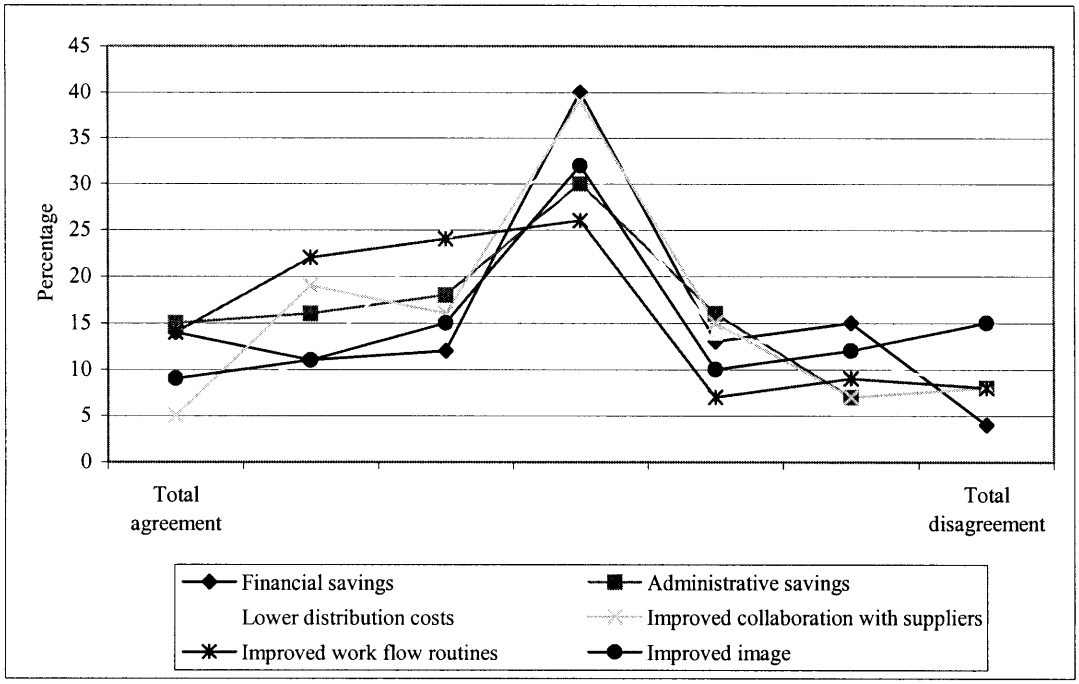
Table 3. Gamma test of economics of scale and dimensions of e-procurement

E-procurement dimensions	Number of citizens		Budget		Budget relative to citizens	
	Respondent self	Others in the municipality	Respondent self	Others in the municipality	Respondent self	Others in the municipality
Seeking information	**-0.31***	-0.15	**-0.35***	**-0.26***	**-0.27***	**-0.36***
Ordering goods/ services	-0.06	-0.12	-0.16	-0.14	**-0.20***	0.10
Paying goods/ services	0.14	0.08	0.14	0.14	0.11	0.06
Receiving goods/ services	-0.16	-0.14	-0.12	-0.04	-0.06	-0.03
Receiving support/ service	-0.16	-0.15	**-0.22***	-0.14	**-0.20***	-0.17

Note. A strong significance is indicated by a p-value less than 0.001 marked bold face and with *

We asked the respondents to address the impacts of e-procurement on six dimensions: financial savings, administrative savings, lower distribution costs, improved collaboration with suppliers, improved work flow routines and improved image. If we add the respondents that answered 1-3 on the Lickert scale, the only improved work flow routines got more that half of the responses (55%). Financial savings had only agreement from 34%, whereas 45% of the respondents found administrative savings to be an impact on e-procurement. Yet, as is revealed in Figure 1 below, the distribution if centered in the middle.

Figure 1. Impacts of e-procurement. Percentage.



Note. The respondents were asked to indicate their level of agreement on a scale from 1 (total agreement) to 7 (total disagreement). The number of responses (n) are104 (improved image), 108 (lower distribution costs), 109

(improved collaboration with suppliers and financial savings), and 110 (improved work flow routines and administrative savings)

There are only few strong positive or negative evaluation outcome of the e-procurement. In our statistical runs, we tested whether the evaluation of outcome is correlated with whether the respondent himself perform the e-commerce or others in the municipalities. We did not identify any correlations on these accounts. Nor did we find any correlation on whether the type of e-procurement is just information seeking or actual ordering. Finally there is no correlation between number of suppliers that the municipalities exchange data with and the outcome.

5. Discussion of findings

5.1 Substantive issues

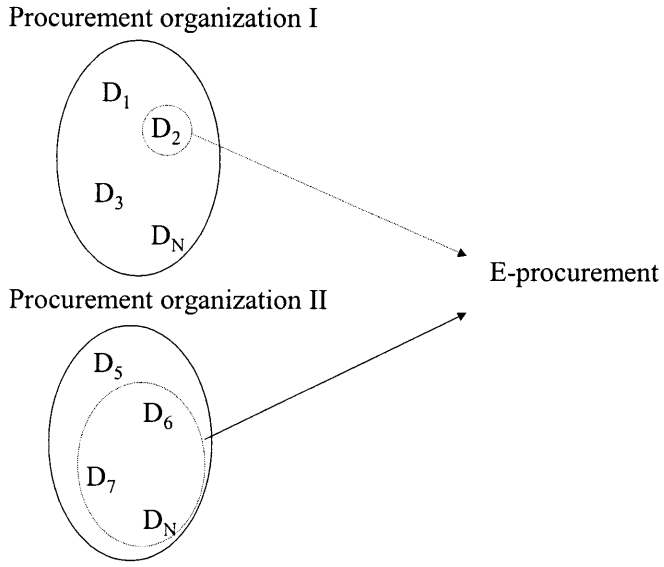
Overall our findings suggest that although there is an uptake in ordering from 1999 till 2002, the primary use of e-procurement is not in the ordering and payment parts, but in seeking information. Various procurement sites are facing fierce competition from well-trimmed and well-established analog procurement processes. An example of this is the procurement of office supplies, where the navigation between the product information and the meetings with the sales representatives are factors that can be serious competitors to any business-to-business website.
Our finding suggests that the bigger municipality (measured by number of citizens and budget), the more likely the municipality is not to seek information through digital channels. This might be explained by the manager has more control over the actual goods bought in the smaller municipalities whereas in the larger municipalities the procurement is more decentralized.
Also, the limited impacts of e-procurements might be equal to the impacts of traditional procurement. We have been able to work with KPMG addressing such issues as frequency of orders, number of shoppers, standing orders, and discounts in the physical/ digital value chain (KPMG 2000). The KPMG study demonstrated that accounting system registers only a very general description of the items bought and the sum. This makes it difficulty to compare the analog and digital value chain. The difficulties are mainly due to the practices in the accounting systems and the relative immature status of B2B search engines on specific product items.
Our analysis also revealed that there are not strong positive or negative evaluation outcome of the e-procurement on the six measurement of outcome: financial savings, administrative savings, lower distribution costs, improved collaboration with suppliers, improved work flow routines and improved image.

5.2 Epistemological challenges

At the epistemological level, we challenge the concept of the rational, "professional shopper". Instead we suggest that more attention is focused on that in some organizations e-procurement is a single actor activity, in other organizations a formulated organizational strategy. Also the number of shopping channels is quite substantial. Web-based procurement is one shopping channel that might be complementary or supplementary with PDA, EDI, standing orders, catalogues, ads, sales personnel, phone and fax orders and pick-up order.
Onwards, e-procurement could encompass one single function or person that shops by a certain frequency, while the rest of the organization use other channels. In some organizations there are several, semi-independent units running their own budget, deciding their content of their work processes themselves and is primarily steering by means of output measurements rather than input or process management. Furthermore, the budget, accounting, contract negotiating and the actual shopping might be separated from the individual shopper. In the "professional shopper" predicament, this is not the case.
In some organizations, managers choose to be involved in the procurement process in a very detailed matter. In other cases, the manager has delegated this task entirely to a lower level of the organization. In Figure 2, we have illustrated the variety of shopping channels from the demand side D.

In one company the employees might have power not only to evaluate the website, but also to take decisions whether to shop at this website. In other organizations, they may not have the choice to change their supplier (only or at all) related to a bad web site evaluation. We believe these issues challenging the concept of the "professional shopper" and are ignored entirely in the literature, yet having the potential to explain the outcome of the procurement process.

Figure 2. The concept of the "professional shopper"



5.3 Methodological challenges

Our analytical perspective in this paper is at the demand side and thereby sensitive to the critique that the supply side is an important factor to consider, in particular because various studies have pointed to that the supply side is not teaming up with the digital e-procurement solutions and/ or do not favor theme in their marketing and expansion strategies. For example, the electronic price catalogs are often used as a mean to push the traditional procurement to lower prices. Hence, the suppliers then set the prices listed in the electronic catalogs so high that there is room for negotiation in the non-digital procurement. Thus, our paper is therefore one-sighted in its demand perspective and able to grasp these dynamic mechanisms between demand and supply.

Also, we did not investigate the various emerging digital interfaces such as mobile technologies that could boost the level of interactivity vertical and horizontal in the public sector. Having the potential for full-fledged market with a range of transaction technologies involved such as mobile and voice recognition technologies might increase the likelihood of a procurement process to be fulfilled (mobile and PDAs) as well as natural language speech recognition. The degree of interactivity holds potentials for shifting from a purely transactional to a more strategic e-procurement task. Yet, institutions seems more aware of pushing the mobile technologies than solving the problem that e-procurement-players lack a "language" platform for assessing e-procurement and taking actions to increase the e-procurement-use (Juul and Loebbecke 2000). Adding the mobile technologies only expand the complexity in implementing e-procurement. The methodological challenge for institutions could be to hold the fire with technological devices and instead work on more fundamental infrastructural challenges that acknowledge the actual administrative division of labor.

6. Conclusions

Various launches of portals, market places, etc. experience lack of demand from B2B e-procurement offices in government. We point to that this could perhaps be explained by a fundamental misunderstanding of the demand side in government. There is no demand side, no procurement offices. Instead there is a variety of people in a variety of locations within the umbrella of a formal municipality. In some governments the overall e-procurement manager is really managing the overall budgets of which goods and services is a small part. Although the procurement is a potential easy part to cut the costs, the relative policy importance is limited. Salary and construction activities are the major part.

One of the main issues that needs more research is that e-procurement could encompass a variety of strategic and dynamic items, but there seems to be no supply of these goods and services (to our knowledge) and perhaps no demand. At the general sourcing market and at the IT market there is plenty of the strategic operations, but in the social services, education, etc. we have not seen component/ fractional e-procurement services appearing. We have not in our survey looked into this area, but we call for further investigation of this aspect.

Governments have part of the new public management decentralized not only management tasks but also budgets and IT applications. Other parts of governmental institutions are focusing attention on the potentials of e-procurement. Our analysis of the Danish case reveals that there is a gap and even possible counter productive element in what the overall budgeting and management reforms of the public sector is doing and in the current form that e-procurement is evolving. There is clearly a need for conducting more research into this area both to explore the nature and validity of this conclusion.

Also, we found that the main use of e-procurement is not in ordering or paying, but in searching information for goods and services. We did not investigate what this information is used for and whether this is this information is used in a complementary sense when negotiating with other procurement channels.

We found a negative correlation with size of the local government measured as budget and number of citizens. This approach to measuring scale holds serious limitations since the respondents we asked in general is not the people who actually do the procurement, but the ones that negotiate the overall procurement. This highlights the classical concerns and limitations to using survey (who is answering them, their interpretation of the questions etc.) and reveals an area that needs much more investigation, namely the B2B demand side.

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