WILL ELECTRONIC PROCUREMENT CHANGE THE PUBLIC SECTOR'S PURCHASING BEHAVIOUR?

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Abstract
This paper highlights the findings from the KNUT project (Electronic Procurement of Telecommunications Services for the Swedish Public Sector). The project creates a service to make the whole public procurement process electronically from analysis of needs, through development of request for proposal (RfP), contract administration and feedback, as well as a model for public procurement of telecommunications services outgoing from end-users' and organisational needs. The study includes a detailed analysis of the procurement process. Among the results is a new way of looking at the pros and cons of procurement from centrally negotiated framework contracts versus local procurement with the help of the KNUT service.

Keywords
public procurement, quality and efficiency of public procurement, electronic procurement service, telecommunications

1. Background

eProcurement is considered as a key impact part of the European Commission’s Action Plan for eGovernment (The Commission of the European Communities, 2006).

Public procurements within the European Union amount to 16.3% of the Community GDP. Thus, it is an important sector of the European economy (http://europa.eu/publicprocurement). To increase efficiency, to reduce transaction costs and to get better competition in place by using electronic public procurement would have a big impact on any government’s spending.

2. Purpose

This paper presents findings from the Swedish research project KNUT (Electronic Public Procurement of Telecommunications Services) sponsored by the Swedish government agency Vinnova1 on electronic public procurement.

3. Methodology and theoretical framework

The research project KNUT used the qualitative method with a practical inquiry approach (Goldkuhl and Axelsson, 2007) based on written sources and interviews. For investigation and defining of public procurement processes axial coding was used (Strauss and Corbin, 1998). The developed model and tool for procuring

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1 Vinnova - (Swedish Governmental Agency for Innovation Systems) is a State authority that aims to promote growth and prosperity throughout Sweden. The particular area of responsibility comprises innovations linked to research and development. The tasks are to fund needs-driven research required by a competitive business and industrial sector and a flourishing society, and to strengthen the networks that are necessary parts of this work.
telecommunications services for the public sector were also tested in life procurement by a local Swedish government.

Public procurement is considered as a special case of transaction between public and private sectors.

The study is limited to Sweden

4. **Electronic public procurement**

Electronic procurement can mean different things for different people from scanning of invoices to carrying out the whole procurement process electronically. Leukel and Maniatopoulos (2005) define *in a public sector context, e-Procurement as a collective term for a range of different technologies that can be used to automate the internal and external processes associated with the sourcing and ordering process of goods and services.*

In the eGovernment agenda (The Commission of the European Communities, 2006) electronic public procurement was pointed out as one of high-impact services. Government revenues account for 45% of GDP and public authorities purchase 15 – 20% of GDP or 1500 to 2000 billion Euros in Europe every year. Electronic procurement and invoicing could result in saving in total procurement costs of around 5% and reductions in transaction costs of 10% or more, leading to savings of tens of billions of Euros annually.

In Sweden, already in December 2005 Verva\(^2\) published a report for the national plan of action for eProcurement pointing out that both buyers and suppliers will benefit from electronic methods for procurements, and that the whole procurement process from planning to billing should and could be done electronically. Sveriges Kommuner och Landsting (The Swedish Association of Local Authorities and Regions) is heading another important Swedish project - SFTI (Single Face to Industry) that aims to standardise the communication between public and private organisations. It has rendered international attention

E-Procurement is one of the projects supported by the IDABC (Interoperable Delivery of European eGovernment Services) programme at the European Commission’s Enterprise and Industry Directorate General. Activities on E-procurement are carried out in co-ordination with the Directorate General for Internal Market and the Members States. IDABC states that *Public procurement by electronic means can improve and simplify the way government procurement operates. This will help enterprises to identify contract opportunities and to supply their goods and services across Europe’s Internal Market, contributing to Europe’s competitiveness and economic growth.*

Somasundaram and Damsgaard (2005) point out that *E-Procurement in the public sector is being implemented worldwide and much money is spent to build up and implement e-procurement solutions.* So far, electronic public procurement has been used to procure mainly commodities such as office supplies and equipment, furniture, books or services like travel. Ordering and billing are the parts of the procurement process that first have been standardised and applied electronically.

There are continuous efforts especially from the European Commission to standardise electronic public procurement as much as possible. The European Commission has published several documents and studies on the subject.

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\(^2\) Verva was one of the Swedish Government’s central advisory agencies. Today, public coordination of framework contracts concerning products and services for the entire public sector in the fields of information and communications is carried out by Kammarkollegiet.
5. **KNUT project**

KNUT project aimed to develop a service, which is accessible for both buyers (public agencies) and sellers (tenderers). The project is based on the idea that decentralization and democratisation should be possible of the public procurement process using electronic tools that support the whole process. In this way, the public procurement process would be more efficient and correspond to an authority’s specific needs. Furthermore, it should reduce the cost for preparation of offers and increase the competition for public contracts not only for big companies but also for Small and Medium size Enterprises (SMEs). The future service based on the KNUT project should produce economies of scale and scope by reducing transaction costs as neither buyers nor suppliers need to re-invent the wheel for every new procurement.

The project aimed to develop a tool for carrying out the whole procurement process electronically from analysis of needs, through development of request for proposal (RfP), contract administration and feedback, as well as a model for public procurement of telecommunications services outgoing from end-users’ and organisational needs. The KNUT project is one of few in the area of public procurement where both the private and public sectors have been represented on equal terms. The academia, represented by Linköping University, had a crucial role as the leader of the project.

The KNUT project started on June 1, 2006 and finished on December 31, 2009.

5.1 **Public procurement process**

In order to develop a tool for electronic procurement, a detailed analysis of the public procurement processes was carried out.

Public procurement consists of two main parallel processes:

- purchasing process of public agency
- selling process of supplier

A public agency can procure directly by following the public procurement process in full and sign a contract with the chosen supplier/s or to call off from an already existing framework contract.

<table>
<thead>
<tr>
<th>Type of contract</th>
<th>1. Direct contract</th>
<th>2. Delivery contract</th>
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<tbody>
<tr>
<td><strong>Purchasing</strong></td>
<td>1A Public agency purchasing</td>
<td>2A Public agency calls off from framework contract procured by the designated agency</td>
</tr>
<tr>
<td><strong>Selling</strong></td>
<td>1B Selling to public agency directly</td>
<td>2B Selling to public agency after signing framework contract with the designated agency</td>
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Fig. 1 Public procurement processes and types of contract (Lindskog, Brege and Brehmer, 2009)
There are four main types of processes in the public procurement arena:
1A - Public agency carrying out purchasing
1B - Selling to public agency directly
2A - Public agency calls off from framework contract procured by the designated agency
2B - Selling to public agency after signing framework contract with the designated agency

1A Public agency carrying out own purchasing

K0 – Anticipation of need to procure
K1 – Analysis of needs
K2 – Market investigation - users
K3 – Market investigation - suppliers
K4 – Legacy
K5 – Procurement strategy
K6 – Development of RFP
K7 – Evaluation of tenders
K8 – Decision and contract signing
K9 – Contract administration

Start of the formal procurement process

Fig. 2 Public procurement – the purchasing process of a public agency (after Lindskog, 2008)

The organisational buying process has been analysed and structured by several researchers, among them Webster (1965), Robinson, Faris och Wind (1967), Wind and Thomas (1980), and Kotler (1997).

Their research findings constitute the base for structuring and analysing the public procurement process of telecommunications services in the KNUT-project. The public agency’s buying process can be divided into ten phases and some of them can be carried out in parallel.

K0 – Anticipation of need to start a procurement process

This is the moment when the organization, and especially its procurement department, observes the need of a new procurement. The absolutely most common reason to anticipate the need of the new procurement is the situation when the current contract is about to expire. If this happen close to the expiration date of the valid contract, it can be difficult to allocate enough time to carry out all necessary steps such as market investigations, analysis of needs, survey of legacy or choosing the procurement strategy.
K1 – Collection and analysis of needs

This is an internal activity in order to know what is needed in detail. Collection and analysis of needs often start with an analysis of the current situation and sometimes with a formulation of vision and strategy to achieve the vision. The vision can concentrate on “core” activities, improvement of the service level towards citizens and businesses, increased efficiency and reduction of costs.

K2 – Market investigation – users

This is an activity in order to find information about what others already have done in similar types of procurements. To meet other public agencies, private companies and/or users’ associations in the own country or abroad and learn from their experiences from procurement of telecom services can be a very efficient way to develop RfPs and to avoid repeating errors committed by others. In contrast with private companies there is no competition between public agencies, which gives possibilities to exchange experiences regarding suppliers, procurement process and internal difficulties. This input can be very valuable for the procuring agency in order to avoid problems or at least to be conscious of their existence.

K3 – Market investigation - suppliers

Public agencies are allowed to have contacts with manufacturers, operators and standardization organizations in the pre-study and market investigation phase. It is important to make use of this possibility in order to avoid unrealistic or costly requirements as well as to avoid missing important “in the pipeline” future services, solutions or functions.

K4 – Collection of information regarding legacy

This is an internal activity that investigates and collects information about already existing contracts and equipment within the organization. The most important parts of this investigation in case of telecommunications are legacies in form of ownership of properties, PABX’s, terminal equipment, and routers, and own networks such as building wiring or municipal broadband network. Other important parts are currently valid contracts on fixed connections, telephony services, switched board operators services, call center services etc. All these aspects must be taken into account in the development of the RfP.

K5 – Choice of procurement strategy

In this activity, the procuring organization investigates possible procurement scenarios and carries out the analysis of the consequences for each of these scenarios. The choice of the procurement scenario heavily depends on earlier undertaken investigations in K1, K2, K3 and K4.

In case of procurement of telecommunications, the KNUT project found three main scenarios:

1. Purchase of equipment
2. Leasing of equipment
3. Service procurement (procurement of function)

Each of the main scenarios has several sub scenarios.

K6 – Development of RfP (Request for Proposal)

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3 PABX – Private Automatic Branch Exchange
The development of the RfP is the central internal activity for public procurement. It includes structuring of mandatory and non-mandatory requirements, decision upon evaluation criteria, and often also contract proposal. Phases K1, K4 and K5 are input values for this activity. In the case of well carried out analysis of needs, legacy and choice of procurement strategy, the development of the RfP can be carried out automatically, i.e. electronically. With the development of the RfP starts the formal procurement process. The RfP cannot be changed after being published.

K7 – Evaluation of tenders

Tenders that do not comply with mandatory requirements are rejected and most of the evaluation will be concentrated on non-mandatory requirements and prices following the evaluation criteria. As a result one or several suppliers are chosen for decision taking.

K8 - Decision taking and contract signing

Decision taken by the procuring organization is valid only after giving during the stipulated time the possibility for the loosing tenderers to make a court appeal if they consider themselves being mistreated.

K9 – Ordering and invoicing, and follow-up – After the contract is signed and up and running the delivery and invoicing period starts depending on the type of goods or services. In case of framework contracts from a designated agency that procures on behalf of other public agencies, it is necessary to have a call-off contract with each specific agency that is calling off from the framework contract. The delivery and invoicing is to the calling-off agency. In order to learn from the specific procurement, it is necessary to measure customer satisfaction and results/profits. This is an important and valuable input for decision making for tendering in other procurements in the same area.

The KNUT project aimed especially on the development of a model and a tool for the phases K1, K4 and K5. The information from these phases can than directly be transferred to already existing electronic procurement tools for development of the RfP. (See green in fig.2)

2A Public agency calls off from framework contract procured by the designated agency

There are designated government agencies that have the right to represent other agencies and to carry out public procurements for specific types of services and goods that result in framework contract. An agency is calling off parts of the framework contract that correspond to their needs and requirements. The calling off agency and the contracted supplier sign a delivery/call off contract that regulates in details all conditions regarding time, quality etc. In Sweden, there are for example twelve designated public agencies with the authority to procure on behalf of other public agencies products and/or services in specific areas of responsibility.

There are two main reasons behind framework contracts carried centrally out by designated agencies:

- Bigger volumes may lead to lower prices and better conditions in general for the procuring entities, reduce administrative work and the total cost of the procurements.
- To use scarce resources in the most efficient way especially in fields of certain complexity often with fast changes in technology as well as on the marketplace.
Fig. 3 Public agency calls off from framework contract procured by the designated agency (after Lindskog, 2008)

The buying process in the case of a framework contract consists of two main sub processes:

- Development of framework contract carried out by a designated authority that is similar to the process of buying in 1A
- Calling of from the framework contract, i.e. purchasing process for the specific public agency.

The calling off agency carries out its process in five phases:

K1a – Analysis of needs

This phase corresponds to the phase K1 in the 1A process. The KNUT model can be used in the same way as in the case of buying by the specific agency directly.

K4a – Collection of information regarding legacy

In this phase the agency carries out an investigation of the current state of existing contracts, equipment and staff in the area of interest.

K6a - Specification of requirements for calling off from the framework contract

K7a - Signing of the delivery contract

K9a – Administration of the delivery contract

This phase includes ordering, control of deliveries and payments invoices as well as follows up to the central procurement authority and internally

The KNUT-model and tool can be used on the central level in phases K1 and K5 and on the local level in phases K1a and K4a.
5.2 KNUT model

Another necessary element of this investigation was the development of a model that could be used for analysis of needs outgoing from end-user types and working situations.

The model is based on the earlier developed model SOTIP by the STATTEL delegation, workshops with representatives from private telecom operators and public agencies, specifications from three big and recently carried out procurements of the central authority Kammarkollegiet (earlier Verva) responsible for framework contracts in the field of telecommunications (2008), City of Stockholm (2005) and Stockholm County Council (2005) as well as interviews with people responsible for these procurements.

The analysis of needs is structured with mandatory and non-mandatory requirements for all end-users and specific working situations.

![Diagram](attachment:image.png)

**Fig. 4 Structure of the features for end-user types and groups of end-users**

In addition to the end-users and group requirements, the five main areas of functionality for management between the buyer’s and the supplier’s organizations were investigated and classified:

1. Configuration
2. Security
3. Performance
4. Fault
5. Accounting

The local government of Lindesberg community tested the model with very satisfactory results as the base for the technical specification part of the RfP.

5.3 Achieved and expected results

The KNUT project aimed to make it possible to cut the cost of procuring telecommunications services for both buyers and sellers. If the buyers and suppliers accept the KNUT model and tool, they would function as a kind of “standard” and
the number of misunderstandings would be minimized. The KNUT project has been developed for the public sector but private companies can easily adapt it as telecommunications services are used in the private and public sectors in similar ways as well as by the authorities or private companies in other countries.

In the long run, if this approach is successful, it can be also used for other types of complex procurements such as within the fields of construction and healthcare.

In the short run, the KNUT project can:
- Facilitate the analysis of needs and writing of requirements specifications for the agencies as well compilation of tenders for the companies aiming to bid.
- Reduce misunderstandings between buyers and suppliers through common definitions and standards
- Reduce dependencies on consultants
- Increase possibilities for adaptation and selection of services specific for an agency
- Increase possibilities for SMEs to bid
- Be used by the private companies for their procurements of telecom services.

In the long run, the fully developed service based on the findings from the KNUT project can:
- Be used in other complex procurement areas
- Facilitate proactive acting for the development of standards outgoing from the users’ priorities and needs.
- Facilitate to act for changes in the procurement law if so deemed necessary
- Be used internationally since telecom services do not differ significantly from country to country.

7. Conclusions

The most important conclusion is that carrying out the whole procurement process electronically can lead to considerable gains of rationalisation and efficiency. The upgradeable and scaleable model enables analysis of needs, collection of information about the legacy of currently valid contracts and a direct transformation of these results into the RfP. Thus, the whole process can be carried out electronically.

The KNUT project makes it possible even for smaller public agencies to carry out their own procurements adequate to their needs without the necessity to call off from centrally procured framework contracts. To call off from framework contracts on different telecommunications services and equipment can many times be as complicated and time consuming as carrying out the whole procurement from the beginning.

It can also increase the number of potential bidders, as a tool to help companies to take the GO-NOGO decision for participating in tendering. Thus, lowering the thresholds for SMEs to put bids for public contracts. This signifies more bids and stronger competition.

The fully developed KNUT electronic procurement tool allows for continuous improvements since information can be collected and analysed in a systematic way each time the tool is used. This makes it easier to understand what is and what is
not important, what kind of hindrances exists of juridical, standardisation or other
nature. In this way, KNUT will help both buyers and sellers to reach the most
favourable contract for both sides.

This type of project is considered timely and of great importance as it deals with
making the public sector and public procurement more efficient. At the same
time the project had obstacles in its daily work. Telecommunications is traditionally
bought through framework contracts and only a few operators can match the
requirements i.e. for having services available in the whole country. The big players
were not keen to open up for competition from the smaller, local or the ones that
deliver only a few services. Another group that did not want this project to proceed
was consultants that regarded it as a threat for their business.

The public sector actively helped with written material and interviews. But it is only
one public agency (currently Kammarkollegiet, earlier Verva) that has continuous
surveillance of the telecommunications market and technical development as its
responsibility. At the same time, the project suggests that each public agency can
carry out its own telecommunications procurement, thus, making the central agency
obsolete. In conclusion, any project such as KNUT should expect hindrances and
difficulties from the organisations that consider that the project is a threat, implying
fewer job opportunities, loss of market share or drastically reduced revenues.

As each public agency recognising the need for procurement has to carry out
analysis of needs and investigate the current state of ownership, service contracts
and equipment independently of the procurement form, type of organisation or
contract, the focus and main efforts should be put on the phases before the formal
start of the procurement process. This follows from the fact that most of the needs
can be directly translated into requirements and limitations. Specifics can also be
handled through the investigation of legacy systems. The development of the RfP is a
much easier task with a well-prepared analysis of needs and properly carried out
investigation of the current state in the area of interest.

Possibly, the most controversial conclusion is the need to reconsider the necessity
of having framework contracts and designated authorities to procure on behalf of
other public agencies. This conclusion is the opposite from the recommendations
given by the Swedish central government agency, Statskontoret, which recommends
a more extensive usage of framework contracts.

8. Future research questions

The KNUT project also points out significant need of future research besides the
development of the KNUT model for structuring of end users’ needs, the control of
existing legacies and choice of procurement scenario. Telecommunications can and
should be used as a means for business development of public agencies.

The KNUT project raised several questions that could not be answered within the
project time and budget frame. Open important research possibilities include:

- Relevance of framework contracts, buyers’ cartels and discussion of what
can and should be procured centrally and locally, respectively.
- Outsourcing and the procurement thereafter
- Development of telecommunications market
- Transfer of experiences from the KNUT project to other complex
procurement areas
- Influence of the KNUT model and tool on the private sector’s procurements.
- Possibilities of transfer of experiences to other EU member states
- Experiences from KNUT from the Knowledge Management perspective
- Electronic procurement – will there be other ways to procure?

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