
Technical challenges in implementing e-Procurement

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E-procurement

- E-procurement describes the use of **network, Web, database**, and related information technologies for **paperless procurement**.
- E-procurement can range from using **electronic data interchange to digitally processed transactions** to sophisticated **order management and inventory control systems**.

E-procurement models

- **e-Procurement software**

- Any Web-based software application that enables employees to purchase goods from approved electronic catalogs in accordance with company buying rules.

- **Online auctions**

- Multiple buyers place bids to acquire goods or services at an Internet site.

- **e-Marketplace**

- Web sites that bring multiple buyers and sellers together in one central virtual market space and enable them to buy and sell from each other at a dynamic price determined in accordance with the rules of exchanges.

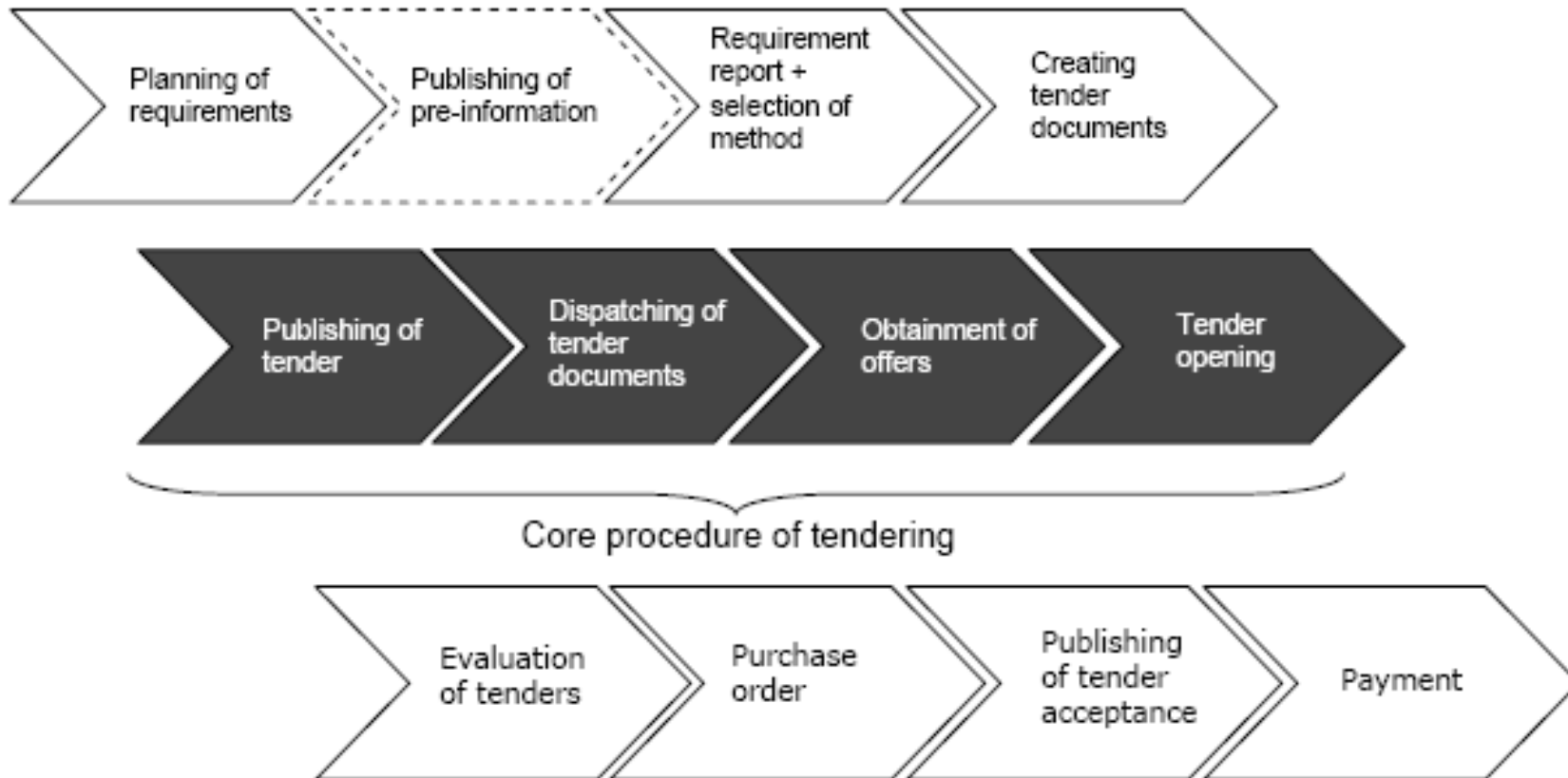
- **Internet purchasing consortia**

- Internet service that gathers the purchasing power of many buyers to negotiate more aggressive discounts.

Survey of the technical practices of procurement procedures in Europe

- The Learning Lab on Public Procurement was launched during the Italian EU Presidency in autumn 2003 to exercise a benchmark of procurement activity across EU members.
- Objective of the survey is to compare status quo and progress within and between European countries and to identify difficulties and possible solutions in the field of public e-procurement.
- The survey was conducted in October and November 2004.

Procurement procedure for tendering public authorities (Cont'd)



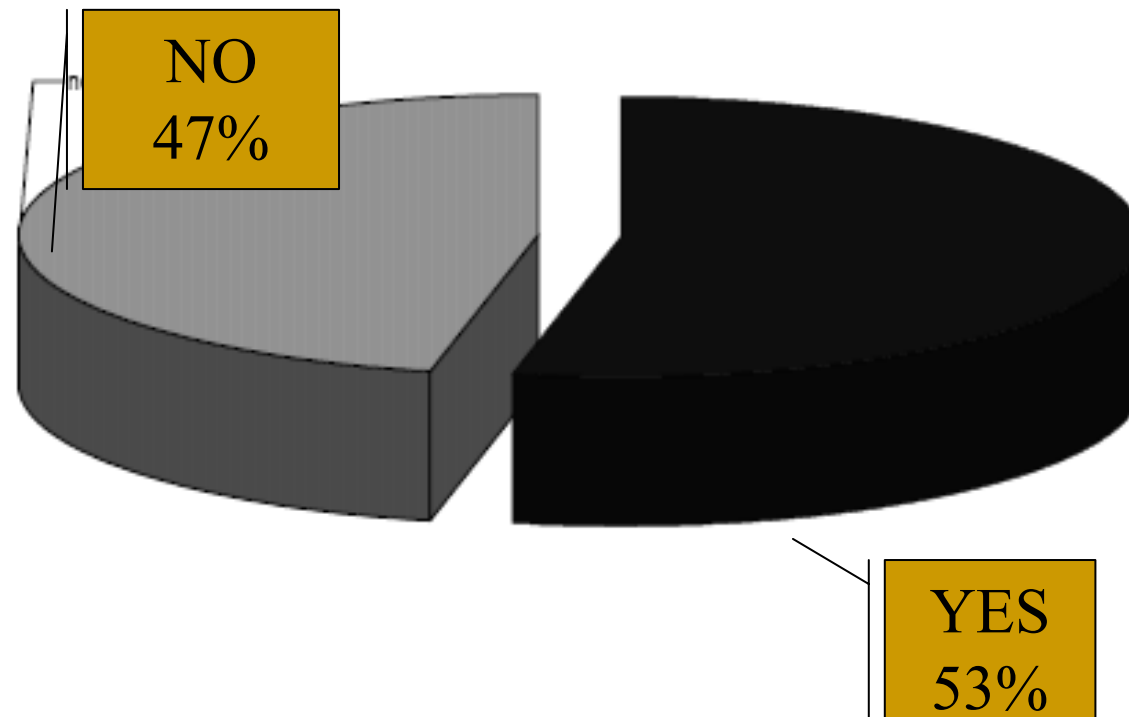
Methods for the execution of each procurement process step (Cont'd)

- **Paper** – including standard forms or the transmission of information by mail or fax.
- **Basic Office Software** like word or excel or e-mail.
- **Individual Software** - including special sw supporting only a particular process step in the procurement process.
- **Online integrated e-procurement solution.** A web-based sw, which supports at least the core procedure of tendering. Information transfer is executed via internet (Http).
- **Offline integrated e-procurement solution.** A non web-based sw, which supports at least the core procedure of tendering. Information transfer is executed via e-mail (SMTP).

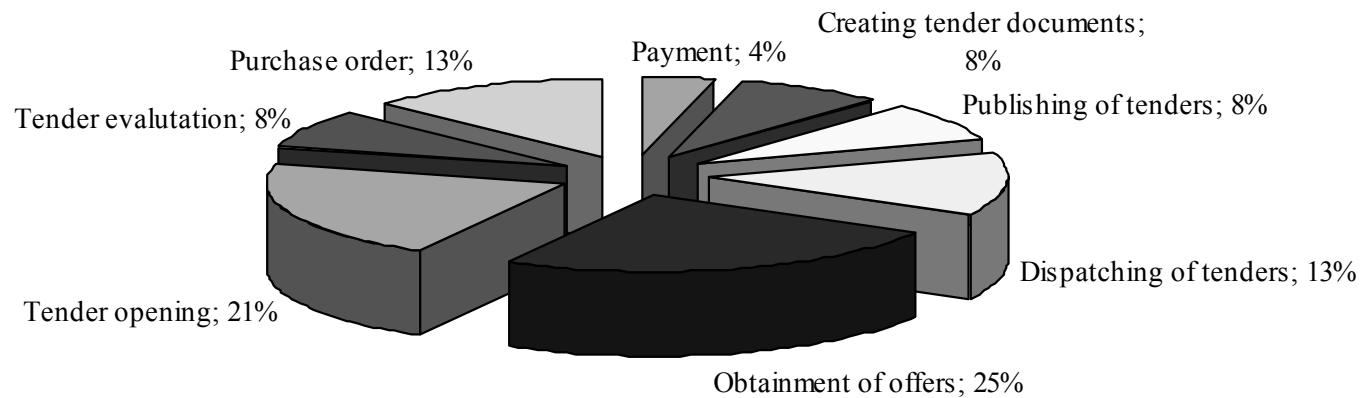
Result of the survey (Cont'd)

	Planning of resources and Requirements	Creating tender documents	Publishing of tenders	Dispatching of tenders	Obtainment of offers	Tender opening	Tender evaluation	Purchase order
Paper	10	8	11	10	13	12	11	12
Basic Office Software	14	13	7	6	4	1	7	7
Individual Software	3	2	4	2	0	0	2	6
Online integrated e-procurement solution	0	4	9	9	7	7	4	8
Offline integrated e-procurement solution	1	0	0	1	0	0	0	0

Use of digital signature (Cont'd)



Use of digital signature in each step (Cont'd)



The cost of e-procurement

- **Application costs + Other costs.**
- **Other costs = 5x to 10x “Application costs”:**
 - Implementation costs
 - Content aggregation, rationalization maintenance
 - Catalog/search engine
 - Transaction
 - End-user training
 - Process re-engineering
 - Associated licensing — e.g., additional DBMS fees, integrationware licensing
 - Marketplace participation

E-procurement checklist

- Are the true procurement costs understood?
- Can savings be achieved without software?
- Have you considered process impacts?
- Are you a dominant player with your supplier base?
- Who will manage the catalogues?
- Have you considered alternatives?
- Who will lead the effort?
- Are the total costs of implementation understood?

Key points

- Technologies offer new prospects at an attractive cost compared to traditional infrastructure.
- Complexities and risks involved are frequently misunderstood.
- Management and culture (not technology *per se*) are the keys.

Key points (Cont'd)

- Installing new technology can be **simple**.
- Extracting maximum benefit involves **complex** governance, management, organisational and behavioural changes.
- Shifting government procurement online has the potential to provide major impetus to the roll-out of ICTs throughout the economy.

Some Technical Evaluation Criteria

- **Technical architecture** →
- Internal and external integration requirements
- **Product information management** →
- Process
- **Payment options** →
- Optimization tools
- E-markets
- Functional specification
- **Costs** →

Technical architecture

- **Technical architecture** covers:
 - ❑ overall design of the e-procurement software
 - ❑ integration of components with each other and with third-party systems
 - ❑ portability and interoperability of the e-procurement suite
 - ❑ quality of the graphical user interface (GUI)
 - ❑ scalability.

Technical architecture (Cont'd)

- The e-procurement product should be **compatible** with previous investments in information technology and help to minimize additional costs.
- The **GUI** influences a product's ease of use. A good GUI is more than just user-friendly: it means that the user can work effectively and efficiently.
- **Scalability** affects the whole process of commerce transactions. Scalability is the capacity to accommodate increased workloads without reduction in performance (*ie* higher volume of transactions).

Product information

- **Product information management** covers the processes that allow users to obtain and manage product information.
- These processes allow for the aggregation of information from one or more suppliers into a consolidated **catalogue**.
- Part of this aggregation include transforming supplier catalogues to conform to a single organizational standard.
- Once consolidated, this information must be stored in a DBMS to allow rapid retrieval and permit end-user analysis of the available purchasing options.

Product information (Cont'd)

- **Catalogues** provide access to product information electronically. They typically allow for browsing by category including product descriptions, price, and availability.
- Organizations may also develop capacity to support supplier-managed catalogues and various **catalogue interoperability standards** such as OBI, cXML and xCBL.
- The **data dictionary** and translation engine provide common naming, semantics and syntax for products supplied through the e-procurement system. These functions help to ensure purchase order accuracy.
- The e-procurement **shopping basket** uses the same metaphor as consumer Web-based shopping to provide end users with the means to keep track of the products they wish to purchase.

Payment options

- **Payment processors:**

- The e-procurement product should process payment for the acquired products using procurement cards, electronic cash, EFT or paper cheques.
- Interoperability with EDI-based EFT and support procurement cards should be among the highest priorities.
- Organizations should also evaluate the ability of e-procurement applications to support more-traditional methods of payment.
- Less-commerce-capable suppliers or certain classes of goods may not be suitable for automation by e-procurement applications.

E-Commerce in Regions

Regions	Value of e-commerce (\$)	%
United States	3.2 trillion	46.4%
Asia Pacific	1.6 trillion	23.2%
Western Europe	1.5 trillion	21.7%
Latin America	82 billion	1.2%
Eastern Europe, Africa, Middle East	68.6 billion	0.9%
Others	450 billion	6.6%

Source: Forrester Research, Inc., 2004

E-Commerce in Arab Countries

E- Commerce in Arab Countries

Countries	No. of internet users	Annual Average spending (\$)	Value of e-Commerce (\$)
Emirates	976,000	22100	1,078 million
Kuwait	200,000	18270	182.7 million
Saudi Arabia	300,000	8460	126.9 million
Egypt	1,000,000	1530	76,5 million
Lebanon	300,000	4010	60.15 million
Oman	120,000	8300	49.8 million
Tunisia	400,000	2070	41.4 million
Qatar	40,000	20100	40.2 million
Bahrain	47,000	15100	35.49 million
Morocco	400,000	1190	23,8 million
Jordan	212,000	1750	18,55 million

Source: Based on World Development Indicators data, 2003

Costs

- **Cost** includes the typical costs of purchasing license rights and maintenance from software vendors. It is necessary to understand other major cost elements, such as implementation, catalogue and marketplace participation costs.
- Initial costs are the costs incurred by an organization to implement an e-procurement application, including the costs of system installation, initial training, and consulting.
- Ongoing costs are the total costs associated with the long term support of an e-procurement solution, including annual maintenance, additional consulting and ongoing training.

Costs (Cont'd)

- Determining the cost of implementing e-procurement is difficult.
- However, buying and installing the e-procurement application represents **a small fraction** of the total expense of implementing e-procurement.
- Implementation, product data and catalogue management, and ongoing maintenance account for much of the expense of e-procurement applications.
- These less visible costs are 5 to 10 times higher than licensing and maintenance costs.

Technical criteria

Evaluation criteria	Description	Weighting factor
Security	Security is the ability of a system to protect information and system resources with respect to confidentiality and integrity. The scope of this definition includes system resources, which include hardware, storage, and application software, in addition to information.	High
Registration/ Authentication	It is required to identify each user that operates on the platform and confirm his credentials in a manner beyond repudiation. User's privileges and the usage of the platforms assets are controlled from the platform that properly identifies and authenticates each user.	High
Liability	Use of the platform under specific conditions may imply potential risks. Assessment of risks and the extent of liability for each user group must be clearly understood and several precautions should be taken accordingly.	Medium
Internal Workflow	Guidance of the users for all involved parties through interactive system actions and messages in order to help on decision making and ensure correct application of rules and regulations.	Medium
Portability	The best implementation of the system will be a platform independent solution, so that all system components, both on client and server side, are portable to other environments with minimal effort and enhancements.	Medium
Parameterisation of Processes	The electronic procurement processes should be parameterised and their attributes should be modified easily with minimal effort in terms of system administrative work.	Low
Audit trail	All electronic procurement actions and system events should be logged and monitored continuously in order to keep track of changes, in terms of security and in order to provide statistical reports for all involved parties.	Medium

Technical criteria (Cont'd)

Open Architecture	The system should provide an architecture whose specifications are public, so that anyone can design add-on products for it. This includes officially approved standards as well as privately designed architectures whose specifications are made public by the designers. In a different case, the architecture will be considered closed and proprietary.	High
Compatibility	The ability of systems to provide services to and accept services from other systems	High
Network Security	The security of the platform must be extended into the security of the existing network and more precisely into local and Internet network implementation, which must allow the secure exchange (sending/receipt) of encrypted data	High
Scalability	The system must be able to meet future requirements, so in terms of hardware and software should be able to adapt to increased demands. Scalability is a very important feature because it protects the initial investment.	Medium
Modularity	The design of the electronic procurement system is modular if it is composed of separate components, both hardware and software, that can be connected together. The benefit of modularity is that any component may be replaced or added without affecting the rest of the system.	High
Reliability / Availability	The ability of a system to respond gracefully to an unexpected hardware or software failure. The underlined technologies may be redundant in order to ensure continuous availability of the system.	High
Multilingual Support	Support of several different languages as far as GUI and other location oriented attributes of the system are concerned.	High

Technical criteria (Cont'd)

Standardisation	A definition or format that has been approved by a recognized standards organization or is accepted as a de facto standard by the industry. Standards exist for programming languages, operating systems, data formats, communications protocols, and electrical interfaces.	High
Total Cost of ownership (TCO)	The TCO incurs all costs that are involved in installing and operating the system. TCO in the electronic procurement system includes: original cost of the system hardware and software, platform licensing costs, hardware and software upgrades, maintenance costs, technical support costs and training costs.	High
Open Source	The application which has the source code available to the general public for use and/or modification from its original design free of charge. Open source code is typically created as a collaborative effort in which programmers improve upon the code and share the changes within the community.	High
Support for e-Catalogues	Support of electronic catalogues or provisions for later development and integration of electronic catalogues into the electronic procurement system	High
Support for e-Auctions	Support of electronic auctions or provisions for later development and integration of electronic auctions into the electronic procurement system	High

Some key prerequisites of e-P

- *Architectural impact.* E-procurement systems require well-defined policy and governance structures. In the public sector individual agencies have diverse levels of autonomy and different procurement policies which makes implementing e-procurement more complicated. This variability may require agencies to support "multienterprise" e-procurement architectures, especially in the presence of a variety of price schedules and aggregate-buying plans.
- *Security.* Regardless of the scope of the e-procurement system, organizations with extensive Web architectures are vulnerable to security attacks. Organizations should not underestimate the need to plan and manage security, and build such planning into budget estimates.

Thank you for your attention