

Innovation friendly procurement model for utilities and a telecom demonstrator in support of it

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Abstract

Innovation-friendly procurement constitutes a significant challenge in the emerging Information Society. It poses challenges in two different directions: development of appropriate procurement methods as well as the development of the support (system) technology that enables the implementation and operation of novel procurement methods. INNO-UTILITIES is an EU funded Project (under the 5th framework), which addresses these challenges. In this paper, we present the goals and preliminary results of INNO-UTILITIES, which started in October 2003 and will finish by the end of 2005. The Project has two main objectives:

(a) To develop policy recommendations for the creation of an innovation-friendly public procurement framework in Europe.

(b) To develop a system architecture for the implementation of a proposed innovation-friendly procurement system; as a case study, the project will execute a transnational transfer of an innovative anti-fraud pro-security technique in the crucial field of telecommunications.

1. Innovation in procurement and procurement of innovation

The spinal column of European everyday life is based on the uninterrupted operation of utilities. This remains unperceived as long as utilities are functioning smoothly, but it becomes extremely obvious when a utility is obliged to halt its supply. Telecommunications, electricity, water, and gas -- all essential resources that are taken for granted in 21st century Europe-- are provided by utilities. In order to provide continuously their life cord, utilities must innovate relentlessly. However, in order to innovate, utilities must follow strict procurement procedures which either have their origin in public procurement provisions, in case of privatised utilities, or are still public procurement provisions, in the case of state-controlled utilities. Nevertheless, conventional public procurement provisions are simply not adapted to modern perceptions of innovation and to the requirements of extensibility and adaptability that new technology places on the complex systems implemented by utilities. At the same time, new procurement models, such as electronic procurement and electronic auctions, are introducing a further complexity parameter in the already complex procurement environment. On the other hand, utilities must innovate not only to meet demand for better services but also to increasingly protect their infrastructure from malign attacks that become more and more frequent due to the omnipresence of information technology. The combination of these two important points (how to make public procurement procedures more innovation friendly and how to protect utilities from modern technology attacks against their infrastructure) gave birth to the INNO-UTILITIES project.

On the forefront of both these factors are telecommunication utilities:

- Telecommunication utilities are the first to be de-regulated/privatized and are currently the most innovative compared to the rest of the utilities. The non-technical component of INNO-UTILITIES addresses several related issues: (i) it studies the procurement framework and procedures that are used by telecom operators in order to carry out innovative projects, (ii) it develops recommendations on how the rest of the utilities can make their procurement procedures more innovation-friendly, benefiting from the experience of telecom utilities, and (iii) it develops recommendations for adaptations of the overall public procurement procedures

of the public sector in general. Public sector purchases represent about 11% of the European Union's GDP, equivalent to half of the GDP of Germany; the public sector can give probably the biggest innovation boost in the EU, if the public procurement procedures become more “innovation-friendly”. The non-technical component of INNO-UTILITIES has as central objective to develop “public technology procurement” as an innovation policy instrument.

- Telecommunication utilities are the first to face large-scale fraud and malign attacks. To give an example, we refer to a sophisticated DoS (Denial of Service) attack that took place in some European countries recently, when the SS7 signalling telephone network was overloaded with artificially generated SMS messages (short messages related to mobile phones). As a result the total telephone infrastructure was completely out of service for a day. FIINA (Forum for International Irregular Network Access) estimates a total figure of around 56 billion euros of losses worldwide due to telecom fraud and security related problems. The main technical objective and innovation of the technical component (demonstration part), is the design and development of a computer system architecture which will make the highly secure operation of innovation-friendly public procurement procedures in the field of telecommunications possible.

The strong interrelation between the two components of INNO-UTILITIES is based on the fact that innovative systems, like the one that is implemented by the technical component, are outsourced to contractors selected through the (public) procurement procedures that are studied through the non-technical component.

2. A procurement model example

A good procurement model example for the INNO-UTILITIES Project is the UNICEF procurement model. As part of its global mandate for child rights, UNICEF uses its knowledge, expertise and integrity to provide children with the appropriate supplies and services they require. However, it cannot do it alone. UNICEF works with governments and other partners to help them in their own efforts to procure supplies for children and their communities. This endeavour includes support in the development of self-sufficient public and private supply systems. Through procurement services, UNICEF acts as a procurement agent for governmental and non-governmental partners, purchasing and delivering supplies and equipment on their behalf. In addition, UNICEF can provide information for research departments of different organisations (this information can be purchased or given for free).

3. Summary of expected and preliminary results

The Project will provide results in both its parts, the non-technical and the technical.

3.1. The non-technical component will

- Provide recommendations on how the rest of the utilities can make their procurement procedures more innovation-friendly, benefiting from telecom utilities' experience;
- Suggest adaptations for the overall public procurement procedures of the public sector, in general;
- Develop “public technology procurement” as an innovation policy instrument.

More specifically, the project will provide two deliverables:

- Successful procurement models used by telecom operators to execute innovative projects;
- Policy recommendations for innovation-friendly public technology procurement.

The deliverables of the non-technical part will provide a brief, up-to-date literature review that surveys relevant works on public procurement and innovation. Among other things, it will establish basic definitions and point to models of “good practice” in innovative public procurement. The literature review will be incorporated into a Deliverable with title “Successful procurement models used by telecom operators to execute innovative projects”.

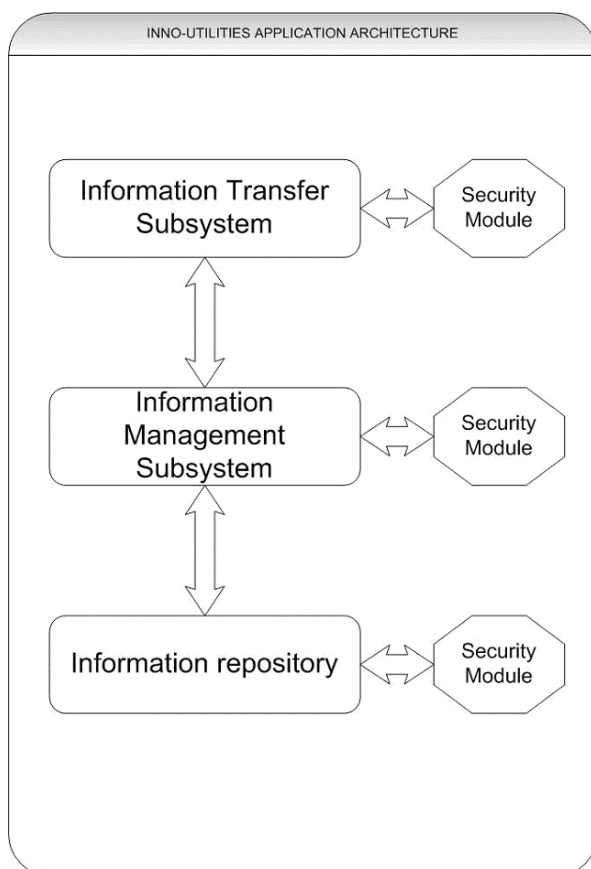
In our work, we will examine how the practices and procedures that telecom operators have employed in innovative procurement have interacted with broader institutional frameworks governing public procurement – such as, for example, the EU procurement directives. On this basis, it will be possible to determine whether, to what extent, and how these broader institutional frameworks have either facilitated or obstructed innovative public procurement. It should also be possible to identify more and less

successful cases of innovative procurement, and to identify models of “good practice”. The research will consist of empirical case studies that will examine how the practices and procedures that the telecom operators have employed in innovative procurement have interacted with broader institutional frameworks governing public procurement.

Additionally, we will provide recommendations on how other public utilities can make their procurement procedures more “innovation friendly” – i.e., conducive to innovation. These recommendations will generalize findings on innovative public procurement from telecom operators to other public utilities operating within the EU. Hence, they will also be formulated in relation to the EU directives on public procurement. We will also provide policy recommendations for the creation of a public procurement framework in Europe that will be conducive to innovative procurement. Specifically, the aim is to develop “innovative public procurement” as an innovation policy instrument.

3.2. The technical component (the demonstrator)

The main technical objective and innovation of the demonstration part, is the design and development of a computer system architecture – both at application and network level – which will make the highly secure operation of innovation-friendly public procurement procedures in the field of telecommunications possible; our case study will be the development of an anti-fraud system. The design shall be easily transferable to other utility fields, such as energy procurement, water procurement, etc.



Application Architecture

The technical component will consist of two main subsystems:

- Information management subsystem;
- Information transfer subsystem.

Both subsystems will have a security module, which will change security levels according to users’ requirements or preferences.

Information Management Subsystem

The information management system will be XML-based, providing tools for advance search, notification, as well as data mining and knowledge extraction mechanisms. Semantic Web technologies are considered as the basis for a robust and scalable system design and implementation.

The security module of the information management subsystem will provide for security classification of the stored information, it will encrypt the stored data and manage access rights to the various pieces of information.

Information Transfer Subsystem

The information transfer subsystem will be designed for addressing three different cases:

- A private network connecting various telecom operators;
- A Secure VPN over Internet, connecting various telecom operators;
- A Secure Web Service, which telecom operators, or other entities, will use to retrieving – or even to purchase – information of interest, if they have the legal right to do so.

The security module of the information transfer subsystem will change the security level depending on the used transfer mode or the security classification of transferred data. For example, very sensitive data will not be transferred over the Internet, even with highly strong cryptography. Moreover, less sensitive data may be encrypted with different encryption methods (faster to execute), if they are to be provided using a real-time web service.

4. Status – Conclusions

The project is ongoing, since October 2003, and has progressed in both its directions. The non-technical component of the project has already finished its surveys and has progressed in the analysis and comparisons of existing methods. The work for the technical component has progressed in that, it has made its significant decisions in terms of network level and security mechanisms (i.e., the decision of XML technology, candidate network architectures and configurations, etc.) and has started evaluating alternative technologies (e.g., SQL, DNS technology, etc.) for the design and implementation of the architecture. Importantly, the content of the demonstrator has been extensively examined and the classification of the available information as well as the implicated legal problems (for sharing fraud information) are being resolved.

Innovation in procurement and procurement of innovation constitute significant challenges in the Information Society, as our work and experience to-date has shown. The methods for procurement of innovation constitute an important and technically challenging field, which will provide the necessary methods for future procurement methods. Importantly, the systems that constitute the “enablers” for the emerging procurement methods are challenging as well. The increasingly dangerous cyberspace leads to the need of sophisticated and provably secure techniques and architectures, which provide a challenge addressed in the project. We expect to provide strong results at both fronts of the efforts of this project.