
Empirical evaluation of public e-procurement platforms in France

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Abstract: Public e-procurement is the use of electronic means for publishing, processing, exchanging and storing all the information related to institutional purchases in public organisations. It requires complex technological tools, which must comply with legal and organisational constraints. In France, such tools have actually been deployed and used in all public institutions since 1 January 2005. The purpose of this paper is to describe briefly the functional and legal requirements for public e-procurement in France, and to present a general evaluation of eight deployed e-procurement platforms using an empirical methodology. The functionalities and general characteristics of the studied platforms are sketched and compared on the basis of commercial and technical data.

Keywords: e-government; public e-procurement; e-procurement platforms.

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1 Introduction

For almost two decades, the development of Information and Communication Technologies (ICT) has been triggering numerous mutations in all economic sectors. In this dynamic context, public organisations have been trying to take into account these evolutions and implement e-government applications. E-government is a general term describing the application of e-commerce principles to administrative procedures and the use of the internet network to interconnect information systems of administrations, local authorities, enterprises and citizen's homes. The main objective is to improve public sector services and to transform governmental structures into fully cooperative and integrated service providers.

E-government applications can be classified into several categories depending on the implicated actors: G2C when it is about exchanges between government and citizens; G2B when it is about exchanges between government and enterprises; and G2G when it is about exchanges between governmental structures. A key feature of e-government G2B applications is moving the public sector's procurement processes to electronic platforms (Tonkin, 2003). E-procurement means online purchasing of goods and services through electronic channels (Parida and Parida, 2005). More specifically, it is the use of electronic means for publishing, processing, exchanging and storing all the information related to institutional purchases in public organisations.

Public e-procurement is an important stage in e-government development, and economic stakes are probably considerable. Public orders in the European Union (EU) – orders of supplies, services and public works – represented 16% of the EU's GDP, or 1500 billion euros in 2002. Its importance varies significantly according to the state member and can be located between 11% and 20% of the national GDP (Euro. Comm., 2006). In France, it represents about 10% of the GDP, or about 180 billion euros per year (Jubert, 2005). The liberalisation of the EU public markets stimulated the competition, notably by facilitating the presence of candidates from other state members. It pushed lower the prices paid by the public sector for their purchases.

Following the general trend of public services modernisation and administrative procedure simplification, public e-procurement was introduced in France in 2001, and has been in application since 1 January 2005 for all public purchases beyond certain amounts. The adoption of electronic means for public procurement is a fundamental organisational stake, since it permits the evolution of governmental procedures, a reduction in their length and a higher degree of procedural transparency, and will contribute to the emergence of a European market (Lomme, 2004). The main expected advantages and disadvantages of public e-procurement are shown in Table 1.

Public e-procurement adoption can be compared to B2B marketplace adoption in the private sector; there is a certain gap between theory and practice (Jelassi and Enders, 2005). An electronic channel cannot easily replace a long-term human and organisational relationship. Users are sometimes suspicious about electronic systems, and cannot as easily have the same degree of trust as for manual procedures. To investigate the reality of public e-procurement in France, the ProAdmin project was initiated in 2005 (Assar *et al.*, 2005b). One aspect of the project is the study and analysis of public e-procurement platforms. The objective of this paper is to report the results of this research work.

Table 1 Expected advantages and disadvantages of public e-procurement

	<i>The purchaser (public institutions)</i>	<i>The seller (private companies)</i>
Advantages	<p>Reduced procedural delays and costs</p> <p>Better communication with the bidding candidates</p> <p>Easier and wider access to bidding enterprises will result in lower prices and more optimised competition</p> <p>Rationalised procedures and reduced risk of errors</p>	<p>Improved access to information and simplified communication with the public person</p> <p>Reduction in offer costs and in payment delays</p> <p>Easier and wider access to public contracts</p> <p>Improved security and confidentiality</p>
Disadvantages	<p>Must provide electronic means to support the e-procurement process</p> <p>Must adapt manual procedures to the electronic channel</p>	<p>Must comply with the specificity of each client platform</p> <p>Must provide electronic-based responses to public contracts (instead of paper based)</p>

In Section 2 of this paper, we define briefly the general setting of public procurement in France. In Section 3, we introduce public e-procurement *virtualisation*,¹ and present the research question. Section 4 is dedicated to the evaluation of eight public e-procurement platforms. We present first a general evaluation based on empirical data gathering, from which is derived a more formal comparison with criteria organised according to three perspectives. Lessons learned are then presented, and the concluding remarks are drawn in Section 5.

2 Procedures for public procurement

A public contract is a purchase and a provisioning transaction issued by a public organisation. It is an exchange of assent between two parties; one is public whereas the other is private. The public contract is constrained by the Public Procurement Contracts Code, and can be realised by a private supplier, an individual or a corporation (MINEFI, 2004). All economic domains are concerned: computing, telecommunications, restoration, office articles, furniture, car acquisition and renting, construction, consulting, auditing, *etc.* There is, however, an important distinction between three categories of public contracts: public works contract, public services contract and public supplies contract.

2.1 Public procurement principles and conduct

According to the Public Procurement Contracts Code (CMP, *Code des Marchés Publics*), the relationship between the two contracting parties, concerned in a public order implies the signature of a contract and the transfer of a certain financial amount in accordance with certain general rules (MINEFI, 2004). These rules are:

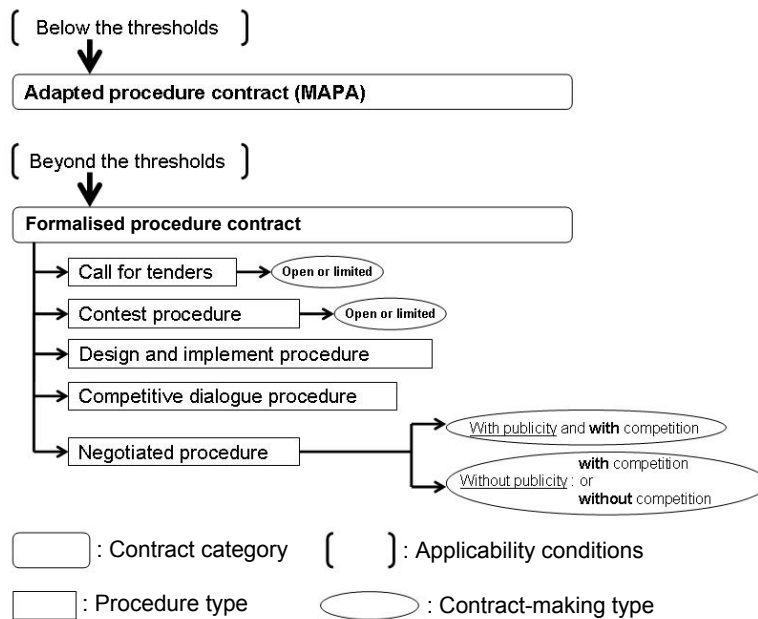
- free access to all information related to public orders
- equal processing of all received tenders
- the global transparency of the whole procedure.

The economically most advantageous offer will be selected. Criteria will be defined according to the nature of the purchase, notably the technical value of the offer, its innovating characteristics, its cost of use, execution delay, aesthetic and functional qualities, after-sales service and technical support, *etc.* These selection criteria are weighed and are clearly defined in the constituent part of the public contract. They are defined in the public call to participation (AAPC, *Avis d'Appel Public à la Concurrence*), in the tender documents for companies (DCE, *Dossier de Consultation des Entreprises*), in the act of engagement, in the specifications of the contract, *etc.*

2.2 Classification of public procurement procedures

Figure 1 sketches the different categories of public contracts. To express his/her need, the public contract issuer has two logics of purchase. For orders below the thresholds fixed by the CMP, he/she can opt for a specific procedure known as the adapted procedure (MAPA, *Marché A Procédure Adaptée*). Beyond the threshold, he/she must resort inevitably to a formalised procedure, which is more secure legally. Thus, the choice of the ordering procedure depends on the amount of the purchase and on the nature of the ordered item. Some procedures, for example, are reserved for software requirement engineering missions, while others for the execution of public works.

Figure 1 Main categories and types of public contract procedures



2.2.1 Adapted procedures (MAPA)

In this procedure, the person responsible for the contract (PRM, *Personne Responsable du Marché*), according to the nature of the purchase and its characteristics, has full liberty in fixing the specificities of the contract and the methods of publicity and competition. All types of purchases are concerned with this category of contracts. For services and

supplies, this procedure is possible for purchases lower than a predefined threshold (150k€ for a state agency and 230k€ for a local authority). For construction works, this procedure is possible for all purchases lower than 230k€.

2.2.2 *Formalised procedures*

Beyond the thresholds quoted previously, the formalised procedure becomes mandatory for the public purchaser. There are five different versions of the formalised procedure:

1 The call for tenders

According to the Public Procurement Contracts Code, a call for tenders is “the procedure by which the public person chooses the most economically advantageous offer, without negotiations, on the basis of objective criteria previously brought to the attention of the candidates”. The call for tenders can be an open tendering or a limited tendering. In an open tendering, all candidates can submit a tender. In a limited tendering, only selected candidates can submit a tender. In both cases, a call for tenders is systematically preceded by a public contract notice. The contract will be awarded by the person responsible for the contract, after opinion from the commission for the call for tenders.

2 The negotiated procedure

It is a ‘procedure by which the public person chooses the holder of the contract after discussing with potential candidates and negotiating the conditions of the contract with one or several among them’. The negotiated procedure can be passed with or without previous advertisement and with or without a call for competition. After negotiation, the most advantageous offer will be selected on the recommendation of a specific commission.

3 The procedure of competitive dialogue

The public purchaser can resort to this procedure when defining the technical means which can satisfy the contract requirement is impossible for it, or when it is not able to define the legal and/or the financial specifications of the project. According to this procedure, the public purchaser specifies a functional programme that includes the requirements to satisfy. This specification will then be subject to proposals from candidate enterprises. Preceded by a public contract notice, this procedure is conducted through a dialogue between the purchaser and the retained candidates. The candidates make proposals based on requirement specifications. After classification of the tenders, the most advantageous one will be selected by the person responsible for the order after opinion from a specific commission.

4 The procedure of design and implementation

The public purchaser can resort to this type of procedure only when the contract relates simultaneously to the design of a project and to the realisation of public works. Therefore, the public contracts passed according to this procedure are construction works contracts. After a specific jury selects a list of potential candidates, the person responsible for the contract awards the contract to the most advantageous offer.

5 The contest procedure

It is the procedure by which the public purchaser chooses a provider based on a jury's opinion in a contest. This type of procedure is generally used in the domain of regional development, urbanism, architecture and engineering or data processing. Concretely, it is about selecting the best technical design offered. The procedure of the contest can be open to all candidates or can be restricted to some selected candidates.

3 Public procurement virtualisation

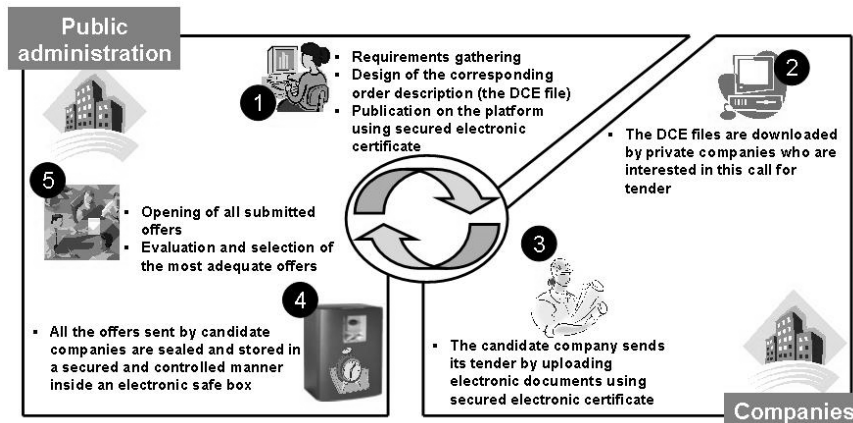
In accordance with European recommendations, all public sector organisations in France must provide (from 1 January 2005) means to accept electronic responses to all their public contract procedures. This implies that to implement this imposed virtualisation, the public institution must have resort to an electronic web-based platform supporting the different types of public contracts, and automating the different procedural categories.

3.1 Overview of the virtualised 'call for tender' process

Using electronic means, the electronic process for the 'call for tender' public procedure is sketched in Figure 2.

- Step 1 Requirements are gathered and the corresponding contract description (the DCE file) is published in a secure manner on the e-procurement platform.
- Step 2 The DCE files are downloaded by companies who are interested in this call for tender.
- Step 3 A candidate company sends its offer by uploading electronic documents using a secure electronic certificate (which was delivered at subscription time).
- Step 4 All the submitted tenders are sealed and stored in a secure and controlled manner inside an electronic safe box.
- Step 5 All the submitted tenders are studied and evaluated in a predefined manner so that the most interesting and most adequate offers are sorted and selected.

Figure 2 Main steps in an electronic call for tender



3.2 *The ProAdmin project*

In the context of public contracts virtualisation, the ProAdmin project was initiated in September 2004 and launched in January 2005 by a group of researchers at the GET² institution (Assar *et al.*, 2005b). This one-year-length project is funded by the LLPR Foundation.³ Its main objectives are:

- to create a network of practitioners and researchers interested in public e-procurement adoption and evolution in France
- to study public procurement procedures and represent them using abstract collaborative models
- to study and evaluate actual e-procurement adoption in the French administration
- to empirically study and evaluate available e-procurement platforms.

The research work presented in this paper is directly related to the last objective of the ProAdmin project. Other research results are two organised workshops (Assar *et al.*, 2005a; Assar and Boughzala, 2006), an online survey (Boughzala and Beauvallet, 2006), research reports and conference publications (Assar *et al.*, 2006) and a collective book edition on the topic of e-administration (Assar and Boughzala, 2007).

3.3 *Research question*

Public e-procurement virtualisation is required and imposed by public law in France (since 1 January 2005). As lawmakers did not define either a specific or a generic solution for supporting the underlying electronic processes, there have been various reactions to this legal obligation. Certain big-sized public organisations (ministries, regional councils, local authorities, central administrations) federated their efforts and deployed sophisticated electronic platforms. Others, like certain town halls, are relying on platforms proposed by internet service providers. These platforms are similar to e-commerce and e-procurement marketplaces (Davila *et al.*, 2003; Parida and Parida, 2005). However, the implementation and the use of these platforms in public administration are problematic for multiple reasons:

- The Public Procurement Contracts Code imposes very specific constraints on public procurement procedures and processes (Section 2).
- The variety and the multiplicity of available electronic platforms hinder experience sharing and the emergence and diffusion of usage best practices.
- The rigidity and the resistance to change of public sector organisations hinder the adoption and the integration of ICT tools in general.

Our main concerns in the ProAdmin project in relation with electronic platforms are of a general order: What are the main characteristics of the available platforms? What are the similarities and differences between them? Is it possible to create a framework for easily comparing these platforms and identifying the most adequate one for a given public organisation? Unlike other research works concerned with the general evaluation of e-commerce adoption (St-Pierre, 2001) or general assessment of public e-procurement development in European countries (Euro. Comm., 2004), we are concerned with evaluating software tools and their adequacy to the reality of public e-procurement virtualisation in France.

4 Platform evaluation

In the period when this research work was conducted (September 2005), we identified 16 electronic platforms available for public e-procurement in France. General information concerning these platforms has been gathered and presented in a research report (Sandi, 2005). The study is based on online product documentation and complementary information available in various websites (zdnnet, 01informatique, *etc.*). More data and indications were gathered through tests and trials achieved directly on the platform (when it was possible).

From a general point of view, these platforms seem to be more or less similar. Their first objective is to provide secure tools to broadcast public calls for participations and calls for tenders. And the second objective is to provide companies with tools to withdraw order descriptions (the DCE files) and to deposit their candidacies and their offers.

However, there are probably notable differences, and the market is sufficiently large to accept distinct and/or similar offers. In this paper, we restrict our presentation to eight selected platforms, empirically identified as being the most well known and/or those that have the biggest share in the market.

4.1 General presentation of selected platforms

4.1.1 www.ixarm.com

This platform is specifically designed for the DGA (General Delegation of the Army) and is devoted to the purchase of weapons, ammunition and weaponries. It was developed by France Télécoms-Ebusiness and Cape Gemini Ernst & Young using open software technologies (SPIPE, Php/MySQL).

Its main characteristics are the support of all types of public contracts (supplies, services and public works) as well as all categories of public order procedures (Section 2), an elaborated editorial content, a mechanism for reverse tenders and several innovating functionalities (such as the online construction of an enterprise candidacy file which is valid for a whole year).

4.1.2 www.achats.defense.gouv.fr

This platform for all other purchases of the Ministry of Defence is also developed with open source software (Spice, Apache, Php/MySQL).

Further, its most important characteristics are the support of all types and categories of public contracts, an elaborated editorial content, and the integration of a mechanism for reverse tenders with a complete supplier directory.

4.1.3 www.achatpublic.com

This platform has been adopted by all ministries. It has been developed using the J2EE standard (JSP + Servlets) by the UGAP (General Union for Public Purchases, *Union Générale des Achats Publiques*) in collaboration with the CDC (Governmental Treasure Agency, *Caisse des Dépôts et des Consignations*), France Telecom, Dexia and The Monitor. The most important characteristics for this platform are the support of all types and categories of public contracts, an elaborated editorial content available for free, e-mail support and chat mechanisms on predefined topics.

Figure 3 Home screen of the *ixarm* platform

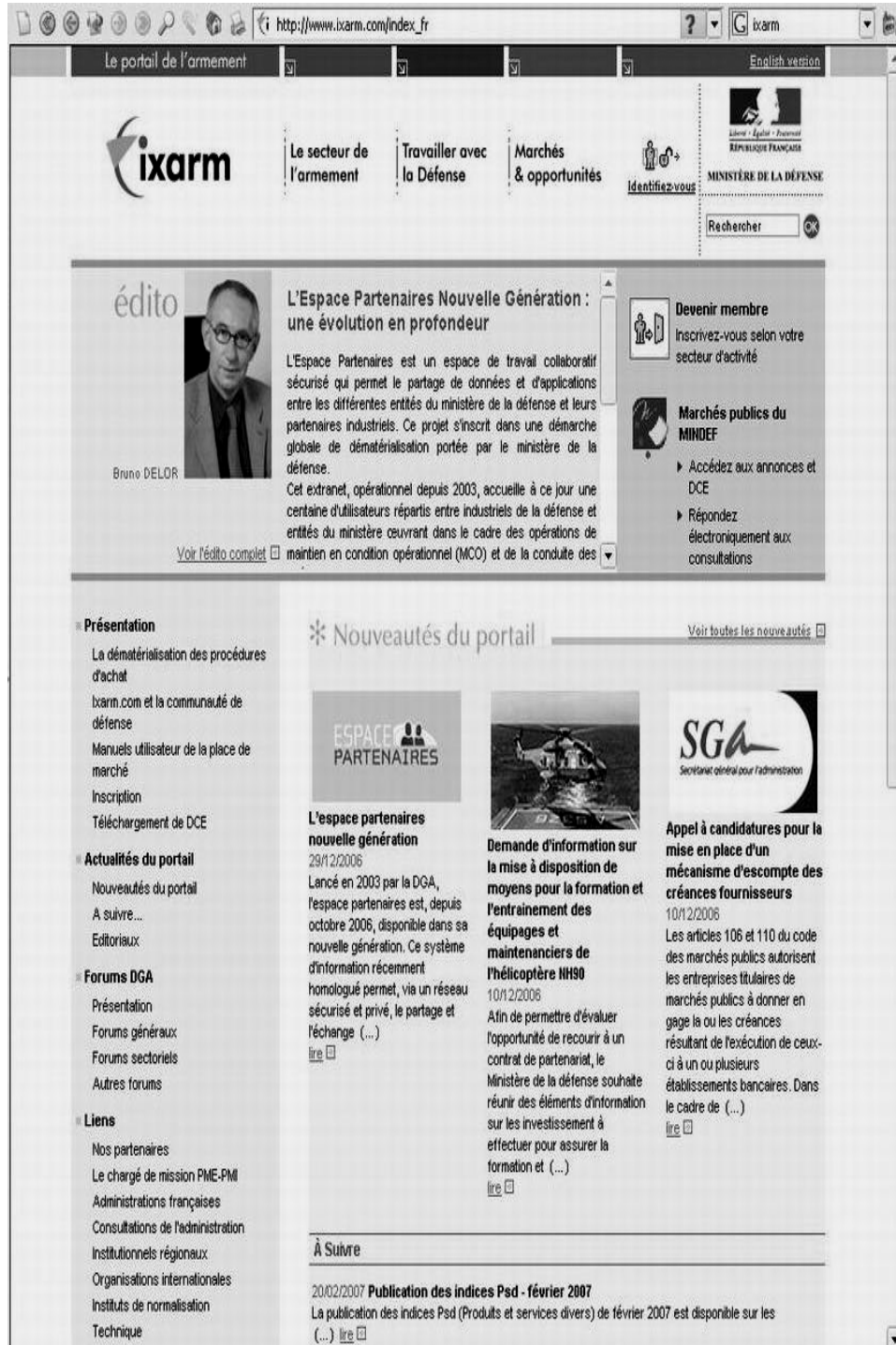


Figure 4 Home screen of the *achats.defense* platform

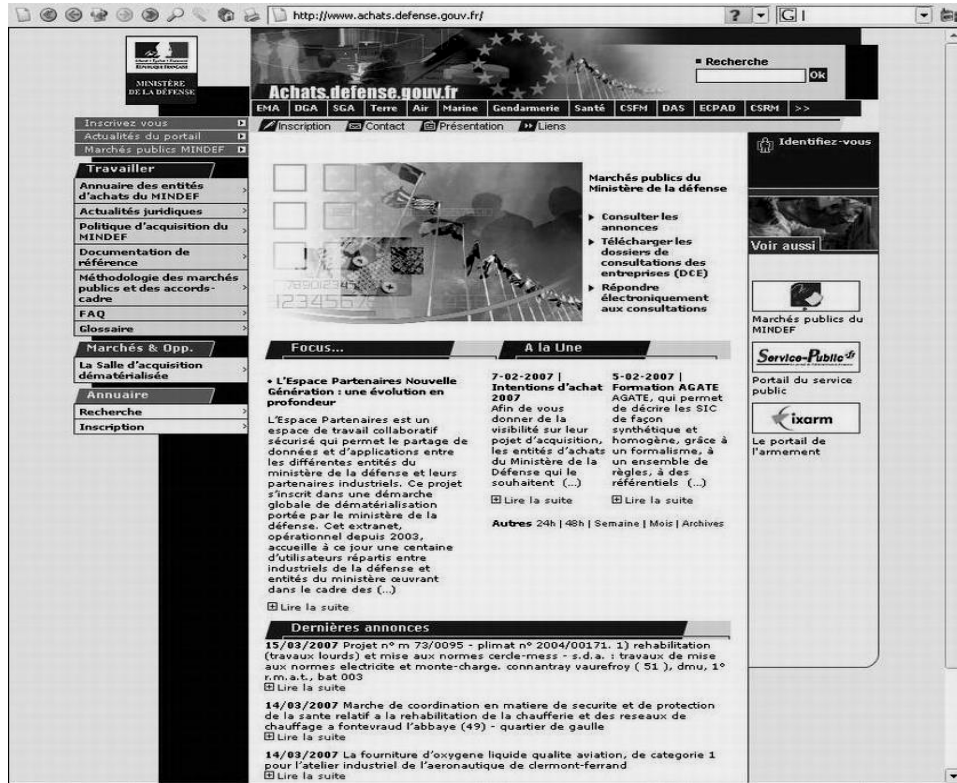


Figure 5 Home screen of the *achatpublic* platform



4.1.4 www.e-bourgogne.com

'E-Bourgogne Marchés Publics' is an electronic platform specifically developed for the region of Bourgogne, using the Php/MySQL tools.

Figure 6 Home screen of the e-bourgogne platform

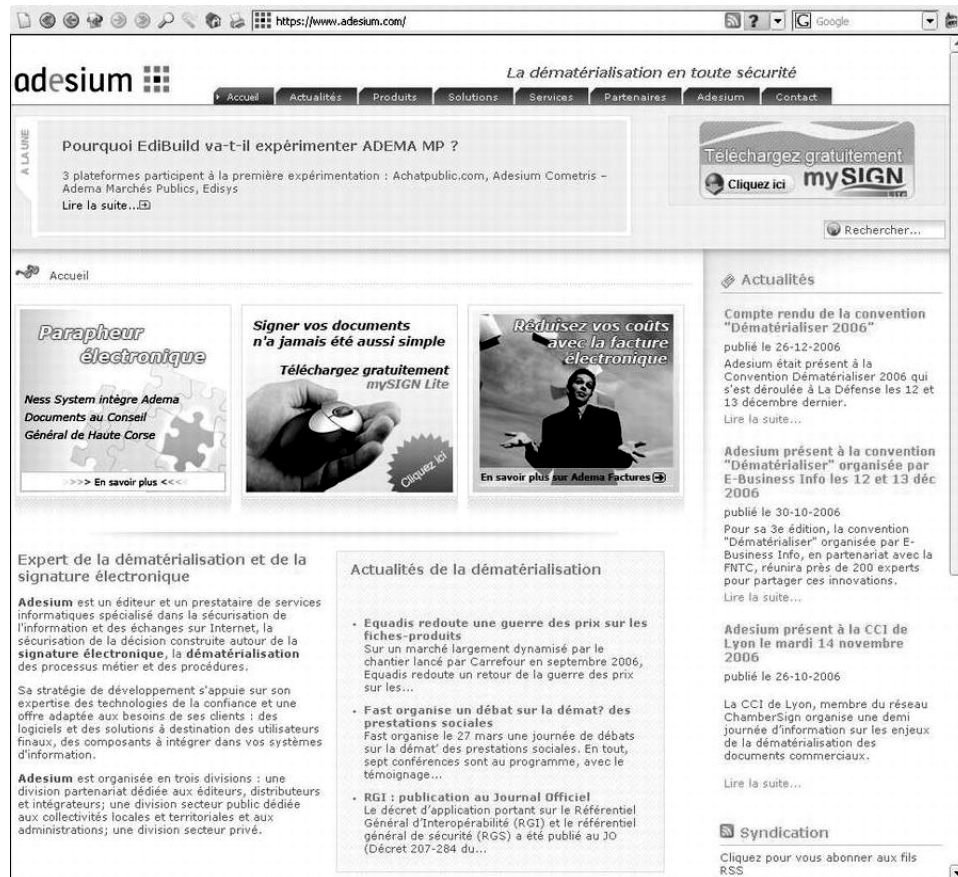


Its most important characteristics are the support of all types and categories of public contracts, an elaborated editorial content (news, newsletter and events) and a simple and intuitive interface, together with some elementary collaborative functionalities (e-mail, document base, forum).

4.1.5 www.adesium.com

'Adema Public Orders' is a customisable platform developed by the company Adesium/Cométris. The Adesium platform is actually used by some local authorities (Val d'Orge, Ville d'Orsay) and regional councils (Essone, Bretagne).

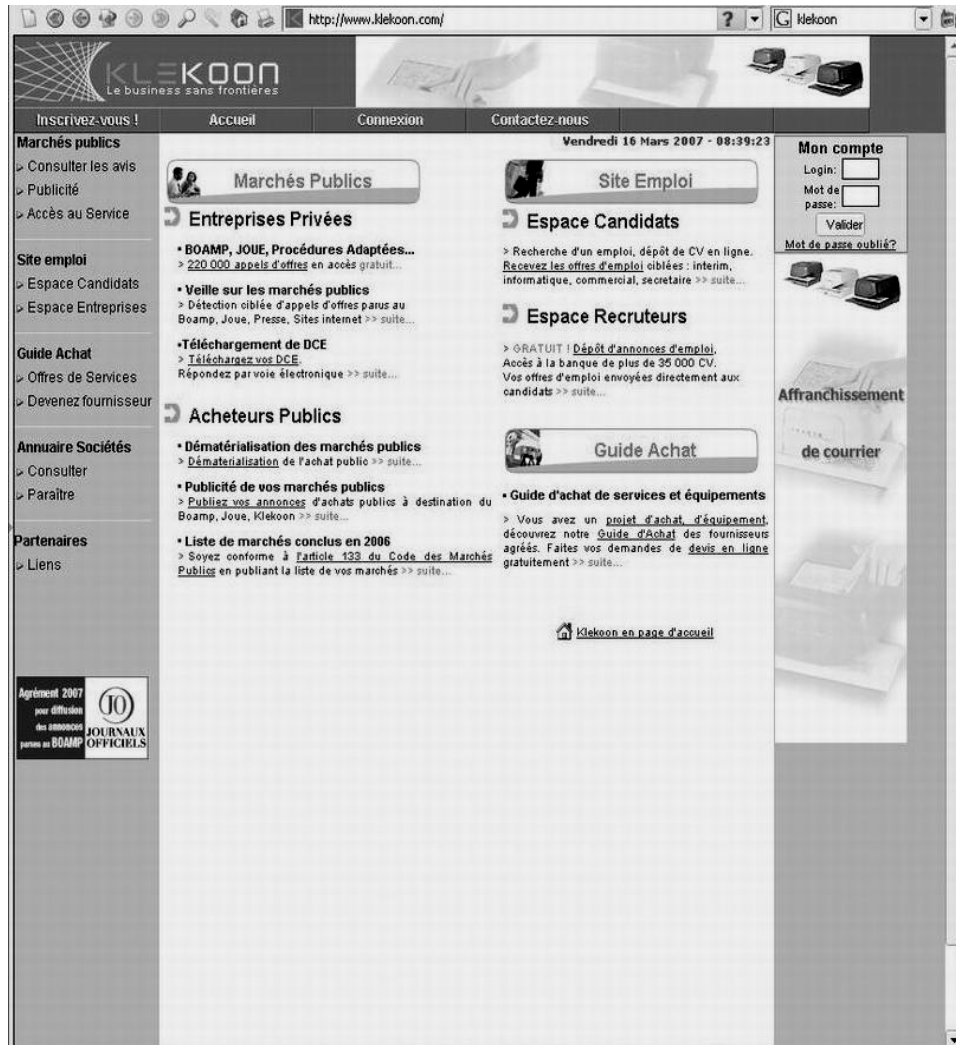
Figure 7 Home screen of the *Adesium* platform



Its most important characteristics are the support of all types and categories of public contracts, a simple and intuitive graphic interface as well as an online help and a hotline. It was developed using the J2EE standard (JSP + Servlets).

4.1.6 www.klekoon.com

This platform is provided by the company Klekoon. It is Application Service Provider (ASP) based, with an intuitive and simple graphical interface. It supports all types and categories of public contracts, and provides sophisticated tools for requesting ongoing and past contracts.

Figure 8 Home screen of the Klekoon platform

4.1.7 *www.legademat.fr*

Provided by the company Umanis-CertEurope, this platform supports all types and categories of public contracts. The security and HCI aspects are predominant in the presentation of this platform. It was developed using the PHP language.

4.1.8 *www.marches-securises.fr*

This platform is proposed by the company Internet Services, which is a subsidiary of EDF/GDF (one of the biggest public industrial organisations in France, dedicated to providing electricity and gas).

Beyond support for all types and categories of public contracts, this platform is ASP based and provides a shared agenda together with a full call-for-tender traceability.

Figure 9 Home screen of the *LegaDemat* platform



Figure 10 Home screen of the *marchés-sécurisés* platform



Table 2 Empirical and comparative evaluation of the selected electronic platforms (continued)

	<i>www.ixarm.com</i>	<i>www.achats.defense.gouv.fr</i>	<i>www.achatpublic.com</i>	<i>www.e-bourgogne.com</i>	<i>www.adestium.com</i>	<i>www.klecoon.com</i>	<i>www.legademat.fr</i>	<i>www.marches-securises.fr</i>
User centred								
Ergonomics and simplicity of graphical interface	++	+	+	++	++	++	++	++
Editorial content availability	++	++	+++	++	-	++	+	+
Online help availability	++	++	++	++	+++	++	+++	+
Usage-oriented hotline availability	-	-	-	-	+	-	+	-
Collaborative tools availability	-	-	+	+	-	-	-	-
Technical								
Level of the implemented security mechanisms	++	++	++	++	+++	++	++	++
Level of system personalisation and parameterisation	-	-	-	-	++	-	-	-
Support for ASP mode	-	-	-	-	-	++	-	++
Software tools used for the development of the platform	SPIP/ PHP	SPIP/ PHP	J2EE	PHP	J2EE	ASP. NET	PHP	ASP. NET

4.4 Lessons learned

On the basis of this comparative study, the following can be concluded:

- Even if there are many different types of public contracts (depending on the nature of the ordered product and on the total amount of the order), they seem to be fully supported by all the studied platforms.
- Reverse bidding is not always supported, whereas getting the lowest price is often an important issue for public institutions.
- Functionalities that are usually available in private e-procurement marketplaces (like the implementation of process best practices or supplier directory) are poorly supported by the studied platforms.
- If a technical hotline is generally provided, a usage-oriented hotline is rare.
- Most studied platforms do not provide collaborative tools (chat, shared agenda, electronic mail, forum, *etc.*).
- Security mechanisms seem to be uniformly implemented in all studied platforms.

- With only one exception, the studied platforms do not support personalisation or parameterisation.
- From a business-model point of view, the ASP mode is not very common.
- Main web technologies are present, but open source software seems to prevail.

5 Conclusion

Public e-procurement is a strategic goal in the development of e-government applications in France and in the European Community. We have studied in this paper public procurement procedures in France, and we have empirically evaluated and compared electronic platforms actually deployed to support the virtualisation of the associated processes. This work is part of the ProAdmin research project, and its main objective is getting a general picture of the software tools actually available for supporting public procurement virtualisation.

A general result of this study is that, although the available platforms seem very similar at first sight, many differences exist according to three perspectives that have been adopted by the general evaluation presented here. This study is actually limited by the empirical methodology that has been employed. Most of the data used are static (gathered from technical descriptions and websites). A more precise methodology (based for example on a usage process-based benchmark) is required to get an in-depth evaluation. Although security aspects seem to be equally supported and implemented in all the evaluated platforms, they have to be evaluated more precisely.

However, in the light of other research activities conducted in the ProAdmin project (practitioners' workshop and online survey (Assar and Boughzala, 2006; Boughzala and Beauvallet, 2006), we can draw some more conclusions concerning public e-platform usage and adoption:

- All studied platforms have been developed by external software providers, sometimes in collaboration with a public organisation, which is often the owner and/or the main user of the considered platform.
- Many technical solutions are available, but for the moment, there seems to be no technological standard for document and file interoperability and exchange.
- Even if the conduct of a public contract process is precisely defined by law, there seems to be no general pattern for the virtualised procurement processes supported by actual electronic platforms.
- Because of these limitations and from the seller point of view (companies trying to bid for a public offer), it is time consuming and error prone for a company to use many different platforms (depending on the bidding administration).

Finally, like some other authors (Wietrzyk *et al.*, 2005), we tend to believe that the collaborative dimension is fundamental in an e-procurement process. Our future work will continue investigating public e-procurement usage and adoption, and will explore the collaborative dimension of public e-procurement through the study of virtual communities' impact on the dissemination of e-government best practices.

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Notes

- 1 We will use the term 'virtualisation' and the verb 'to virtualise' to denote the process of moving an activity (or a set of activities) from a physical, paper-based form to a computerised, internet-based form.
- 2 Groupe des Ecoles des Télécoms, <http://www.get-telecom.fr/>.
- 3 Louis Le Prince Ringuet, <http://www.flr.org/>.