

ELECTRONIC TRANSMISSION OF PROCUREMENT NOTICES FOR PUBLICATION

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Analytical framework – background information

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Acronyms

Acronym	Description
API	Application Programming Interface
BSI	<i>(Bundesamt für Sicherheit in der Informationstechnik)</i> Federal Office for Information Security
CA	Certification Authority
COTS	Commercial Off-The-Shelf
CPB	Central Purchasing Bodies
DTD	Document Type Definition
EC	European Commission
EEA	European Economic Area
EEC	European Economic Community
EU15	Refers to the 15 countries in the European Union before the expansion on 1 May 2004
EU25	Refers to the 15 countries in the European Union after the expansion on 1 May 2004, when eight central and eastern European countries as well as Cyprus and Malta joined the organization.
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
ICT	Information & Communications Technology
J2EE	Java 2 Platform Enterprise Edition
NOJ	National Official Journal
ROJ	Regional Official Journal
OEXP	OJS Exchange Protocol
OGC	Office of the General Counsel
OJ	Official Journal
OJEU	Official Journal of the European Union
OJS	Organization Jointly Shared
OPOCE	Office des Publications Officielles des Communautés Européennes
PC	Personal Computer
PDF	Portable Document Format
PKI	Public Key Infrastructure
PPD	Public Procurement Directorate
SIMAP	Système d'Information pour les Marchés Publics
SME	Small and Medium size Enterprises
TED	Tenders Electronic Daily system
XML	Extensible Mark up Language

Glossary of Terms

Term	Description
2004/17/EC	Directive 2004/17/EC of the European Parliament and the Council of 31 March 2004 coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors
2004/18/EC	Directive 2004/18/EC of the European Parliament and the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts
New EU Public Procurement Directives	Refers to 2004/17/EC and 2004/18/EC Directives
New Legislative Package	Refers to 2004/17/EC and 2004/18/EC Directives
Commission Regulation (No 1564/2005)	Commission Regulation (EC) No 1564/2005 of 7 September 2005 establishing standard forms for the publication of notices in the framework of public procurement procedures pursuant to Directives 2004/17/EC and 2004/18/EC of the European Parliament and of the Council
EEA Agreement	European Economic Area Agreement - in force 01/01/2004.
New EC standard Forms	They have been introduced by Commission Regulation (EC) No 1564/2005 of 7 September 2005 which establishes standard forms for the publication of notices in the framework of public procurement procedures pursuant to Directives 2004/17/EC and 2004/18/EC of the European Parliament and of the Council
Old EC standard Forms	They were introduced by Commission Directive 2001/78/EC of 13 September 2001 on the use of standard forms in the publication of public contract notices
National Forms	National forms referring to the national thresholds set for the publication of notices to the OJEU and the National Publication Outlets
Electronic signature	It is the electronic equivalent of a hand-written signature. The electronic signature software binds the signature, or other mark, of a user to a specific document. An electronic signature also requires user authentication such as a digital certificate, smart card or biometric method
Digital certificate	It is an electronic "smart card" that establishes user credentials when doing business or other transactions on the Web. It is issued by a certification authority (CA). It contains user data, a serial number, expiration dates, a copy of the certificate holder's public key (used for encrypting messages and digital signatures), and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real.
SIMAP online forms tools	Refers to SIMAP – Forms 2002 and SIMAP – Forms 2005

1 Introduction

This document constitutes Volume III of the Final report of the “Electronic transmission of Procurement notices for publication” project, discussing the mandatory utilization of electronic means for the publication of notices, the opportunities for modernizing existing practices and the elaboration of an administrative and technical framework, which can be adopted by the competent authorities in Europe, for improving the current setting.

Towards this objective, an analysis of the current situation in all EU Member States, as well as, EEA, and Acceding countries¹ has been carried out and the collected information has been organized in a systematic manner, through 30 Country Sheets. These Sheets display information on the Administrative Structure / Responsible Institutions and the Public Procurement Legal Framework in each country, as well as, on the existing Operational and Functional / Technical Framework. (The Country Sheets can be found in Volume II of the Final report of the “Electronic transmission of Procurement notices for publication” project).

Drawing on this analysis, recommendations are elaborated on the necessary preparatory actions for mandating the electronic transmission of notices and a roadmap is drafted for the steps to be carried out forward. (Scenarios and a roadmap for mandatory electronic transmission mechanism can be found in Volume I of the Final report of the “Electronic transmission of Procurement notices for publication” project).

Following the collection of information on all the European countries investigated in the first phase of the Study, the second phase, which is the object of the current report, concentrates on a comparative assessment of all countries, based on a set of predefined indicators. The scope of the comparative assessment aims at depicting the current framework in place in the different European countries as regards procurement publication activities. Critical issues and opportunity-type elements referring to each country investigated separately are identified and described in detail. This exercise results in a categorization of the countries according to their scores, which will be further explained below, as well as in the presentation of best practices.

Specifically, the ranking of the investigated countries will be based on six indicators (legal readiness, e-Notification solution, ICT readiness, security infrastructure, financial impact, and level of cooperation/interaction). These indicators cover the essential points of interest identified, focusing on legal, organisational, and technical issues/characteristics of the e-Notification solution or traditional paper-based notification mechanism provided by the investigated countries. Furthermore, the ranking forms the basis for the formulation of further recommendations and scenarios in order for the countries investigated to apply a mandatory mechanism of electronic transmission of notices.

¹ Although since the beginning of 2007 Bulgaria and Romania are official Member States of the European Union, the country information included in the current report has been collected before 2007, hence in the context of this report both countries are considered as Acceding countries

2 Feasibility and development analysis

2.1 Summary on preliminary assessment: legal, organizational and technical aspects

This section presents an overview of the country comparative assessment based on the essential axes of the Study, namely, the legal, organisational and technical characteristics of each country's public procurement mechanism. A detailed analysis will be described in the section below for identifying, comparing and assessing the issues that need to be addressed in order to allow for the mandatory electronic transmission of notices for publication.

The transmission of procurement notices using solely electronic means presumes the establishment of an appropriate operational framework along three main dimensions: legal, organisational, and technical. The maturity of the framework is important for the implementation of the mandatory electronic submission of notices. European countries and the European Commission need to perform certain actions in order to clearly define and improve the current situation in all three dimensions.

The European Commission performed major steps in the establishment of a common legal framework in all Member States in the field of public procurement with an aim to open up the market. An integral part of this, as prescribed also by the Lisbon Strategy (2000) is to ensure that Small and Medium Enterprises (SMEs) are more involved and successful in tendering for public contracts. In 2004, the new EU public procurement Directives were adopted and in 2005, the Regulation 1564/2005 mandating the usage of the new procurement notice forms was issued. The Member States along with the EEA and Acceding countries are to take appropriate actions in order to fully implement the new EU public procurement framework in their national legal system. In this context, they have initiated the transposition of the new legislative package and taken further steps (i.e. adopting their national forms to EC standard forms) in simplifying the processes and activities for the efficient drafting, validation, approval and submission of procurement notices using electronic means. Furthermore, the main objective of the provisions in the EEA Agreement (01/01/2004) on public procurement is to oblige contracting authorities and entities within the EEA to apply certain procedures when procuring supplies, services and works with a value exceeding given thresholds. This is essential in order to secure equal treatment of all suppliers, service providers and contractors established within the EEA. As a general rule, notices on contracts to be awarded are published in the OJEU. Also, the Acceding countries have an obligation to implement EU legislation as an integral part of their joining the European family and adopting the “*acquis communautaire*” in particular. They aim at giving maximum practical effect to the single market by providing European suppliers with an equal opportunity to contract with public bodies and utilities within the Member States.

As a result, by October 2006, half of the countries investigated had completed the transposition of Directive 2004/18/EC². In parallel, Directive 2004/17/EC had been transposed by the same group of countries, including Ireland. Furthermore, some countries are currently working on the finalisation of their secondary legislation, the more or less wide use and regulation of electronic means of communication in the field of e-Procurement and the homogenisation of their national forms with the EC standard forms, covering public contracts below EU thresholds.

In the organisational area, the investigated countries work towards the establishment of an operational organisational framework for the electronic creation, validation (internal to each contracting authority and of e-Notification systems and solutions), transmission and publication of procurement notices at different levels. These levels comprise the OJEU, national/regional publication outlets, local publication, and the buyer's profile.

² Austria, Cyprus, the Czech Republic, Denmark, France, Germany, Hungary, Italy, Latvia, Lithuania, Malta, the Netherlands, Poland, Slovakia, and United Kingdom

However, the investigated countries follow different and diverse business flows for the preparation and publication of procurement notices. In general, all the business flows can be categorised into two main groups, namely the centralised and the decentralised flows. The centralised flows include the flows where a central authority of any given country performs one or more activities for the creation and/or validation of a notice before publication. The decentralised flows include the flows for which full responsibility for the preparation and publication of a notice resides with the relevant contracting authority. Therefore, the organisational framework that should be put in place throughout Europe for the preparation and publication of notices should be capable to support both types of flows.

In addition to the organisational framework for the preparation and publication of notices as such, European countries can instigate actions for the overall improvement of e-Procurement services and of their usage. Such actions may include the education of the public and private sector employees on the new rules for conducting public procurement, training activities for the use of e-Procurement (and e-Government) systems, investment for increasing the overall ICT literacy of the population, etc.

The investigated countries are also currently working on the implementation of a technical framework, which can electronically support the chosen organisational framework. Moreover, in order to meet the diverse needs described above (centralised/decentralised publication flows, etc.) the technical implementation should be fully adaptable and customisable. This entails the development of an IT system, consisting of one or more applications able to operate independently one from another, and intercommunicate appropriately, so that the full lifecycle of a procurement notice (e.g. creation, validation, translation, and publication) can be supported. The various options are discussed below in section 5.3.

As a complement to the technical framework for supporting the lifecycle of notices, the investigated countries can also invest in the overall upgrading of the usage of electronic means within their remits. Investment for the increase of the internet uptake of enterprises, for the improvement of telecommunication networks, for the development of the “infrastructure index”, etc. represent various possibilities that a country can explore for improving the environment for the electronic publication of notices.

2.2 *Presentation of indicators – categorization – methodology*

The methodology followed in the second interim report concerns the identification, presentation and processing of country information collected in the first phase of the Study. During the first phase, the contractor collected country information covering legal, organisational, and technical aspects, depicting the country settings for the transmission of notices for publication, using both electronic and paper-based means. Where appropriate, information from different public administration levels was acquired, be at central or regional authority level. The collection of information was achieved through direct contacts with approximately three representatives per country, as well as, through ongoing desk research. Communication with OJS e-Senders and/or private companies was also established where possible.

The second phase of the Study covers the assessment of the investigated countries consisting mainly in identifying and evaluating the information collected while proceeding with desk research for accuracy purposes essentially. The results to be achieved at the completion of the second phase will form the foundation on which the road-map will be produced.

The categorisation performed in the current report is based on six individual indicators the analysis of which will provide a clear picture of the obstacles and advancements of each investigated country. The detailed analysis of these indicators in conjunction with the operational models and the proposed scenarios will provide a detailed view of the underlying background and existing potential for the development, adoption, and efficiency of e-Notification solutions using electronic means for the transmission and publication of notices. These indicators are thoroughly studied in individual paragraphs and are briefly introduced here:

- Legal readiness: the status of a country's legislation in terms of providing the required background in order to support and guarantee the necessary principles of e-Notification solutions as directed by EU guidelines (equal treatment, non-discrimination, transparency). Identifies whether the legal framework draws the regulatory setting required to improve advertisement and increase competition.
- E-Notification solution: existence; structure; features and overall efficiency of a country's e-Notification system for the preparation, validation and approval of procurement notices.
- ICT readiness: quality of the technological infrastructure of a country, maturity, span and penetration of the applications and services provided; respective capacity of human resources; social willingness and interest in the use of ICT; related educational system; existing opportunities of the public to use ICT solutions; respective policy and initiatives taken.
- e-Identification and security infrastructure: overall effectiveness and reliability of e-Notification solutions and traditional paper-based notification mechanisms; implementation of e-Identification systems; existence of user authentication and authorisation systems; reliability of data storage and data exchange; efficient elimination of computer virus threats; existence of time stamping tools.
- Financial impact: issues concerning the reduction on purchasing prices due to increased competition expected by the use of electronic notification systems/solutions and the reduction of operational/maintenance costs of system resulting from the simplification of the respective administrative work; fees paid for publication both in national publication outlets and e-Notification system.
- Level of cooperation/interaction: centralised or decentralised procurement systems; use of Central Procurement/ Purchasing Bodies and OJS e-Senders; administrative arrangements and interoperability established; openness and transparency of procurement process; promotion of competition within the Community.

The outline of the methodology used for the completion of this second interim report is the following. Initially, the notification operational models adopted by the countries investigated are identified in terms of infrastructure and procedures followed. These add up to the adoption of one of three models, namely the fully centralised model where all contracting authorities are obliged to submit their notices primarily to their unique national e-Notification system (mandatory use of the system); the semi-centralised model where procurement notices are submitted to the OJEU either directly or through the national e-Notification system (optional use of the system); and finally the fully decentralised model where contracting authorities are free to submit their notices directly to the European/National publication outlets while having the complete responsibility for the validation of their notices. In this case, no central e-Notification system is yet in place and contracting authorities procure solely via the SIMAP platform or through the services of OJS e-Senders.

In the next step, the information is gathered according to the predefined set of indicators encompassing all legal, organizational and functional/technical characteristics. The information collected during the first phase of the Study is processed. Additional communication with responsible national procurement authorities in the countries investigated may become necessary for the accuracy and completeness of the second interim report. Furthermore, desk research accompanies the findings by clarifying and confirming "problematic" or unclear areas.

The identification of critical issues and opportunity-type elements referring to legal, organizational and functional/technical characteristics applicable in each country investigated follows and consists of: a step by step approach; initial conclusive remarks drawn; country scoring according to each indicator. The identification of such critical issues and opportunity-type elements is the result of a critical analysis of the general information collected for each country investigated on all matters of legal, organizational, and technical/functional nature.

Following the overall assessment, each country investigated will be assigned to one of three groups of countries depending on the average calculated by the addition of the scores achieved independently by each country at each indicator level.

- According to this, the first of the three groups comprises the “advanced” countries where a national e-Notification system or private solution already exist and are being used efficiently; where there is adequate training and ICT management skills of procurement personnel within the contracting authorities; where financial resources are available; where the level of security for the submission of procurement notices is high and finally where concrete national strategic initiatives/programmes are being implemented.
- The group of “intermediate” countries is characterised by the existence of plans for the improvement of existing e-Notification systems, private solutions or alternatively e-Notification system under development; the need for general progress in the field of e-Procurement; adequate ICT penetration and skills of procurement personnel; allocation of financial resources for the modernisation of public procurement and an increased level of security for the submission of notices.
- Finally, the “developing” countries present slow and cumbersome progress, with no immediate plans for the introduction of an e-Notification system or private solution; with an under-developed infrastructure; low level of ICT penetration; low level of ICT skills of procurement personnel and training; limited financial resources; complex legal procedures and low level of security for the submission of notices.

After realising the categorization of the countries investigated in the three different groups, the best practices experienced in all areas of interest in the investigated countries are presented. The presentation of best practices will assist in the final formulation of recommendations and scenarios to be handed and proposed to the countries investigated in order for them to take the appropriate actions for the implementation of the electronic transmission of procurement notices. The recommendations and scenarios provided will eventually pave the way, in the third and last phase of the Study to a road-map introducing a system (solution) of mandatory electronic transmission of procurement notices for publication at a European level.

3 Operational Models

Out of the 30 investigated countries, 22 have a national e-Notification system³ for the publication of procurement notices. The advertisement however is mandatory⁴ only in 13 of them. In this case, contracting authorities are responsible to submit their notices to the national e-Notification system in a structured (i.e. online forms, offline editors, and XML interfaces) or an unstructured format (paper, fax, email). The e-Notification system is responsible for dispatching the notices to the National Official Journal and to the OJEU if necessary (for contracts above EU thresholds), or requested (for contracts below EU thresholds).

The technical framework supporting the electronic submission of procurement notices is based on the legal and organisational requirements of each individual country. Although there are no technological barriers for the implementation of a common e-Notification system, there are legal barriers mainly related to interoperability, data integrity/data protection and user authentication issues. However, similar approaches (i.e. concepts, workflow activities, technologies and standards) have been followed so far by the investigated countries for the implementation of their e-Notification solution.

Besides the implementation activities followed by the investigated countries, the EU Publications Office has developed three systems for the electronic submission of procurement notices in a structured format. Two of these systems (SIMAP – Forms 2002 and SIMAP – Forms 2005) are Web based applications using online forms for the electronic submission of the old and the new “SIMAP” forms for publication to the EU Publications Office. The third system (OJS e-Senders) uses “Web Services” that enables National Official Journals and contracting authorities, including Central Purchasing and Procurement Bodies to submit structured electronic notices to the OJEU in the form of XML messages.

Three models have been identified for categorising the existing e-Notification systems, solutions and/or traditional paper-based notification mechanisms based on the activities followed for the electronic or paper-based transmission of procurement notices to the OJEU and other publication outlets, namely a fully centralised, a semi-centralised, and a fully decentralised public model. These are outlined in the following subsections.

3.1 Model A –Fully centralised

The first model presents a centralised approach where all contracting authorities are obliged to submit their notices primarily to their national e-Notification system. The current model also covers the mandatory or optional submission of procurement notices to a Central Purchasing Body (if applicable) that arranges framework contracts used by all State authorities. The Central Purchasing Body utilises information systems capable of handling the collection of purchasing requirements from one or more contracting authorities, drafting procurement notices and submitting them for publication to the National Official Journal and to the OJEU.

The countries following this model are Estonia, Finland, Germany (only at Federal level), Ireland, Lithuania, the Netherlands, Romania, and Norway. In these countries, the State and local Government is responsible for the development, promotion, and maintenance of the legal, operational, and technical framework supporting the e-Notification solution. The Government is also responsible for the selection of implementation standards and technologies, as well as, for the development of common guidelines and tools. The national e-Notification systems provide online and offline tools for the drafting, validation and submission of procurement notices. They also provide XML interfaces (i.e. Ireland) for the extraction and submission of notice information directly from the back office system of the contracting authorities.

³ BE,CZ,DK,EE,FI,FR,DE,HU,IE,IT,LV,LT,LU,MT,NL,PL,ES,NO,BG,RO,UK, SE

⁴ CZ,EE,FI,HU,IE,LV,LT,LU,MT,PL,SE,NO,RO

The drafting of procurement notices is based on two separate sets of forms, covering both above and below threshold contracts. For above threshold contracts, the forms are the same with the new standard forms amplified with some additional fields required for the internal use and statistical management of the procurement process. The forms for below threshold contracts are either different and require information specific to the national needs of some of the investigated countries or the same with the forms used for above threshold contracts in the rest of the investigated countries. For contracts below thresholds, contracting authorities have the option to request submission to the OJEU.

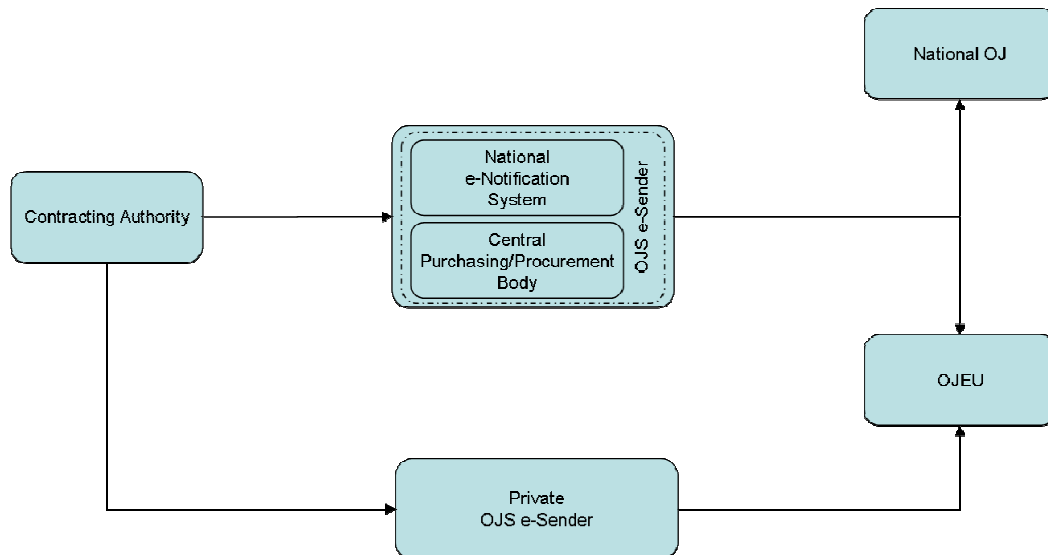


Figure 1: Model A – Fully centralised

This model as described above also covers the existence of a **Central Purchasing Body**, which handles the establishment of framework agreements at a Federal and State level and therefore provides similar functionality and follows the same rules as any national e-Notification system. Mandatory submission is currently in force only in Germany at the Federal level and within the year 2007-2008 it will also be applied in Finland at State level. Despite the fact that the establishment and maintenance of a Central Purchasing Body requires additional effort (i.e. implementation and maintenance costs), it is considered by many countries to reduce costs in the long run and increase the overall efficiency of public procurement.

The existence of a **Central Procurement Body**, which acts centrally on behalf of other contracting authorities, can play a particular role in the proper and efficient use of electronic notices. Its main responsibility is to provide assistance to contracting authorities during the preparation, internal validation, and submission of their procurement notices to the National Official Journal and the OJEU. Furthermore, it is accountable for monitoring/reviewing procedures, for providing advice, for offering training to the procurement personnel of contracting authorities, for publishing notices, etc. In countries such as Lithuania, Norway, and Romania, where the submission of procurement notices to the National e-Notification system is mandatory, the Central Procurement Body (if applicable) may become an integral part of the validation process for the submission of notices to the National Official Journal and to the OJEU.

Contracting authorities have the option to submit their notices to the e-Notification system either in paper or in electronic format (i.e. online forms, XML interface). Although contracting authorities are not obliged to submit their procurement notices electronically for publication to their national e-Notification system, the number of paper based submissions is very low in all countries operating under this model. Almost all State and the majority of local Government authorities in the countries concerned are now registered and use the online tools provided by their national e-Notification systems. They follow the guidelines provided for the preparation, validation, approval and publication of their notices. However, there are still a few small (i.e. publishing one tender per year) contracting authorities which submit notices to their national e-Notification systems in an unstructured (paper/fax/email) format.

The countries under this model have the highest percentage (i.e. Finland – 97%, Ireland – 95%, Lithuania – 93%, the Netherlands – 78%, Romania – 94%, and Norway – 95%) of procurement notices submitted electronically in a structured format to the OJEU⁵ as presented in Figure 2 below. Furthermore, almost all of their notices are submitted to the OJEU in a structured XML format (i.e. Finland – 96%, Ireland – 92%, Lithuania – 92%, and Norway – 94%). These numbers indicate that more than 90% of the contracting authorities operating within these countries are capable of submitting their notices electronically using the tools provided by each individual e-Notification solution.

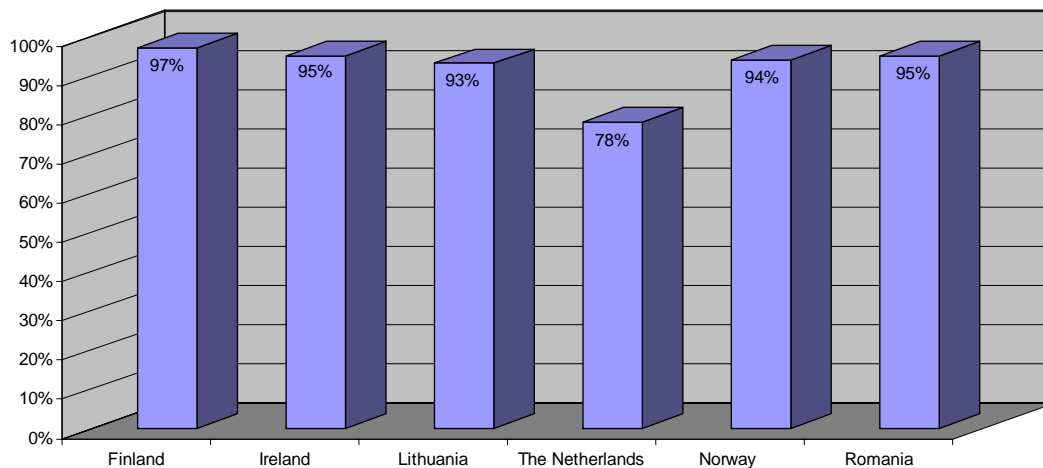


Figure 2: Model A -Notices submitted electronically to the OJEU in a structured format

This structured communications infrastructure supporting the contracting authorities in all the countries concerned is the result of proper planning, and availability of financial and technical resources. The deregulation of the telecommunications industry and the establishment of co-operations between the public and private sector have played an important role in the financial investment for the development (ICT equipment and training of personnel) of the rural areas. Furthermore, they launched e-Commerce and e-Procurement initiatives focusing on the infrastructure, skills and knowledge, security and other regulatory aspects related to the effective use of the ICT mainly in the public sector.

According also to the e-Government readiness Index for 2005, all of the above countries are at the top 12 countries with the exception of Lithuania and Romania which are at the bottom of the list. Although the ICT is one of the fastest growing sectors in Lithuania and Romania, its successful development at national level in both countries still represents a stumbling block (underdeveloped and outdated infrastructure) due to the lack of liberalisation in the telecommunications industry. This is so because the development of the ICT is directly dependent on the political and economic progress (i.e. insufficient investment from foreign investors). Major changes are however expected within the next few years following the full liberalisation of the telecommunications industry and the development of wireless networks.

The overall structured submission of notices to the OJEU from Estonia and Germany is below the average⁶ of the investigated countries. In Estonia this is due to technical and organisational problems experienced currently at the public procurement Register regarding the transposition of the new EU Directives and the implementation of the new standard forms, whereas in Germany due to the high level of decentralisation and the difficulties experienced in the adoption of e-Vergabe.

⁵ Statistical information on Public Procurement Notices published on TED – (Figures covering the third quarter of 2006) – OPOCE

⁶ 62% - Average for the third quarter of 2006- TED

Although the level of system utilisation and of automation of processes involved in the e-Notification solution in these countries is quite high, only Germany, Lithuania, and Romania use electronic certificates for the identification of contracting authorities. Germany also uses e-Certificates for digitally signing notices. All other countries enforce low security requirements for accessing their e-Notification system with the exception of Ireland which uses an intermediate level of security. However, the identity of contracting authorities is validated before the actual publication of notices to the National Official Journal and/or to the OJEU.

The majority of countries concerned (Ireland, Lithuania, the Netherlands, Romania and Norway) operating under this model have implemented their e-Notification systems on Microsoft technologies and deployed them on Microsoft operating systems and servers (i.e. Web, application and database servers). This indicates a preference on the use of commercial off-the-shelf (COTS) software customized to both regional and national needs.

The following figure (Figure 3) depicts the business process supported by the organisational framework for the electronic submission of notices under Model A. It describes all the major activities undertaken by contracting authorities, the national e-Notification system, the Central Procurement/Purchasing Body and the European/National Publication Outlets.

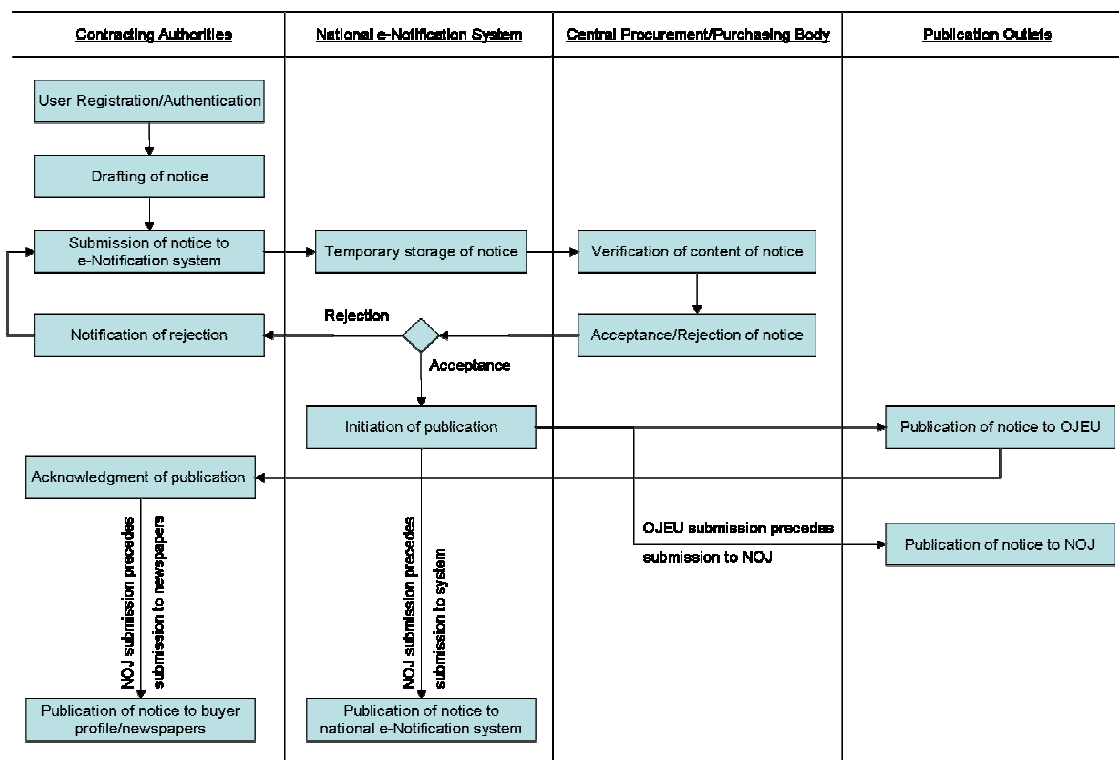


Figure 3: List of activities for Model A

The activities involved in the preparation, validation and submission of notices to all publication outlets comprise:

- User registration and authentication: A contracting authority uses the mechanism provided by the national system in order to register and receive authorisation to use the system. The latter creates a virtual workspace where notices are created and stored. The level of security enforced for the identification of users is considered low⁷ for Estonia, Finland, the Netherlands and Norway, medium⁸ for Ireland and high⁹ for Germany, Lithuania and Romania.
- Drafting of notices: Once registered in the system, the contracting authority will prepare and draft the notice either using the online or offline tool by downloading the relevant notice forms. An initial verification is performed by the responsible procurement officer.
- Submission of notice to system: When drafted online, the notice is submitted electronically to the central system using HTTP or Secure HTTP protocols, at which point the validation process is started. If applicable, notices are electronically signed prior to their submission. When drafted offline, the notice is electronically submitted to the central system either by XML interface or on paper.
- Storage of notice: Notices are stored in a secure location where only authorised personnel can have access to them.
- Verification of content of notice: Verification and validation activities are performed by the personnel responsible either in the national e-Notification system or, if applicable, in the Central Purchasing/Procurement Bodies.
- Acceptance/Rejection of notice: A notice can either be accepted or rejected by the personnel responsible for verifying the content of its information.
- Notification of rejection: In case a notice is found erroneous or incomplete, the responsible body will send it back to the relevant contracting authority which, in an iterative manner will perform all activities needed for its correction and re-submission.
- Initiation of publication: Once validated and accepted, notices are dispatched for publication to the OJEU (for above threshold values) before being published in the National Official Journal (for both above and below threshold values).
- Acknowledgement of publication: Acknowledgement of publication is usually provided by the OJEU directly to contracting authorities or to the central e-Notification system in the form of an email message. Subsidiary publication may take place either in regional journals, buyer profiles or newspapers.

3.2 Model B – Semi-centralised

Under the second model, contracting authorities submit their procurement notices to the OJEU or the National Official Journal either directly and independently or through the national e-Notification system.

The countries following this model are Belgium, Bulgaria, the Czech Republic, France, Hungary, Italy, Latvia, Luxembourg, Malta, Poland, Spain, Sweden, and the United Kingdom.

⁷ User credentials automatically provided by the system without prior validation

⁸ User credentials are provided by the body responsible for the validation of the identity of the contracting authorities

⁹ PKI is enforced

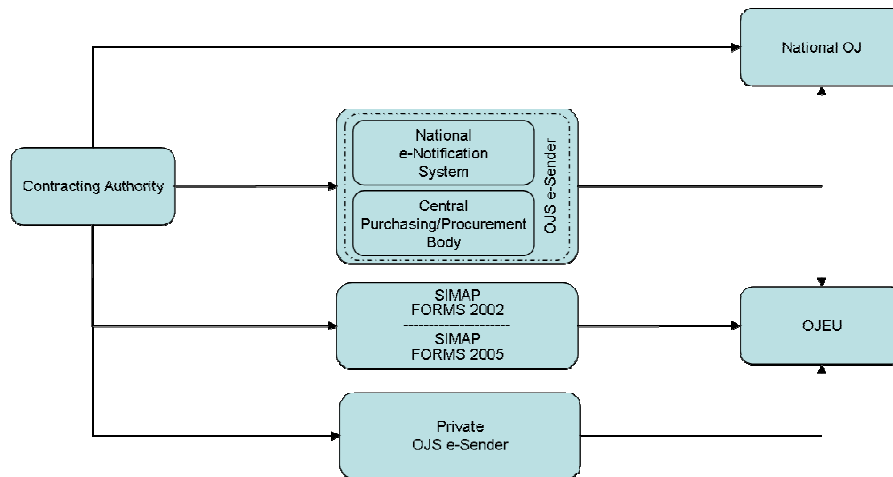


Figure 4: Model B – Semi-Centralised Model

In this scenario, the role of the national e-Notification system can further be assumed by any public or private OJS e-Sender.

Contracting authorities in these countries use the best possible option that fits their budget and their needs for filling their procurement notices. The most popular options are the following:

- Use of a national e-Notification system for the preparation, validation and approval of notices (above and below threshold contracts)
- Use of a third party OJS e-Sender/commercial application offering web based tools for the drafting and submission of notices to OJEU, as well as, for the publication of below threshold contracts.
- Use of the SIMAP online forms tools for the direct submission of procurement notices (using either the old or the new EC standard forms) to the OJEU.
- Use of Application Program Interface (API) with the back office system of the contracting authority, adapted to the organisational needs of the contracting authority in question. This approach usually follows an offline preparation of procurement notices.
- Use of no application/system. Contracting authorities fill the EC standard forms offline using the paper based version of the EC standard forms.

The activities involved in the preparation, validation and submission of notices to all publication outlets comprise:

- User registration and authentication: A contracting authority uses the tools provided either by the national system, or the SIMAP online forms tools or any other private OJS e-Senders, in order to register and receive authorisation to use the system. The system may create a virtual workspace for editing, and administering the procurement notices. The level of security enforced for the identification of users by the different type of systems is the following:
 - o National systems: The level of security is considered low for Belgium, Bulgaria, Hungary, Italy, Luxembourg, and Poland, and medium for Malta, Sweden, United Kingdom and high for the Czech Republic, France, Latvia, and Spain
 - o SIMAP online forms tools: The level of security offered by the Publication Office is considered low since it is based on simple user credentials (username and password) provided automatically by the system
 - o Private OJS e-Senders: Different levels of security are provided by the OJS e-Senders ranging from low to medium level of security.
- Drafting of notices: Once registered in the system (national system, SIMAP online forms tools, OJS e-Senders), the contracting authority will prepare and draft the notice either using the online or offline tool by downloading the relevant notice forms. An initial verification is performed by the responsible procurement officer.
- Submission of notice: When drafted using the online tools of the system, the notice is submitted electronically to either to the national system or directly to OJEU using HTTP or Secure HTTP protocols, at which point the validation process is started. If applicable, notices are electronically signed prior to their submission. When the notices are electronically submitted to the national system or the OJS e-Sender, they are responsible for dispatching the notices to the National Official Journal, as well as to the OJEU or any other publication outlets, if requested.
- Storage of notice: Notices are stored in a secure location where only authorised personnel can have access to them. This is a basic functionality for the national systems and the SIMAP online forms tools, whereas for the OJS-e-Senders it may constitute an optional feature.
- Verification of content of notice: Verification and validation activities are performed by the personnel responsible either in the national e-Notification system or, if applicable, in the Central Purchasing/Procurement Bodies.
- Acceptance/Rejection of notice: A notice can either be accepted or rejected by the personnel responsible for verifying the content of its information.
- Notification of rejection: In case a notice is found erroneous or incomplete, the responsible body will send it back to the relevant contracting authority which, in an iterative manner will perform all activities needed for its correction and re-submission.
- Initiation of publication: Once validated and accepted, notices are dispatched for publication to the OJEU (for above threshold values) before being published in the National Official Journal (for both above and below threshold values).
- Acknowledgement of publication: Acknowledgement of publication is usually provided by the OJEU directly to contracting authorities or to the central e-Notification system in the form of an email message. Subsidiary publication may take place either in regional journals, buyer profiles or newspapers.

The countries under this model have a rather high percentage in general (i.e. Belgium – 62%, Czech Republic – 81%, France – 75%, Hungary – 45%, Italy – 53%, Luxembourg – 80%, Malta – 89%, Poland – 57%, Spain – 44%, Sweden – 88%, UK – 84%) of procurement notices submitted electronically in a structured format to the OJEU¹⁰ as presented in Figure 5 below. Bulgaria and Latvia are still paper based. The first one because it is not yet a EU Member State (join on 01/01/2007), whereas the second one due to lack of the ICT infrastructure.

Only 20% of the countries (i.e. Czech Republic – 81%, United Kingdom – 56%, and Sweden – 82%) are submitting a large volume of their notices to the OJEU in a structured XML format. Another 20% submits only a small number (i.e. Belgium – 12%, France – 26%, and Hungary – 3.8%) of their notices via OJS e-Senders, whereas the remaining 60% do not use that option yet.

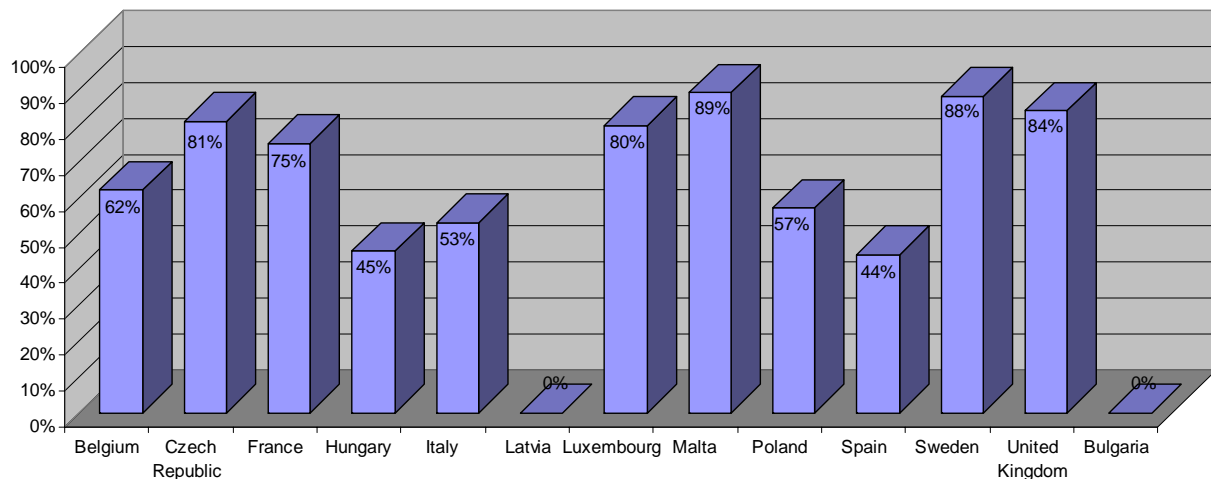


Figure 5: Model B -Notices submitted electronically to the OJEU in a structured format

The activities involved in the preparation, validation and submission of notices to all publication outlets are almost identical with the ones described in the first model. An important difference between the first and the second model is that the contracting authorities can submit their notices to the OJEU either directly and independently or through the national e-Notification system. The latter is generally responsible for dispatching the notices to the National Official Journal, as well as to the OJEU or any other publication outlets, if requested.

Figure 6 depicts the business processes for the optional submission of notices to the e-Notification system for above threshold contracts. It describes all the major activities performed by contracting authorities, the national e-Notification system, the Central Procurement/Purchasing Body and the European/National Publication Outlets.

¹⁰ Statistical information on Public Procurement Notices published on TED – (Figures covering the third quarter of 2006) – OPOCE

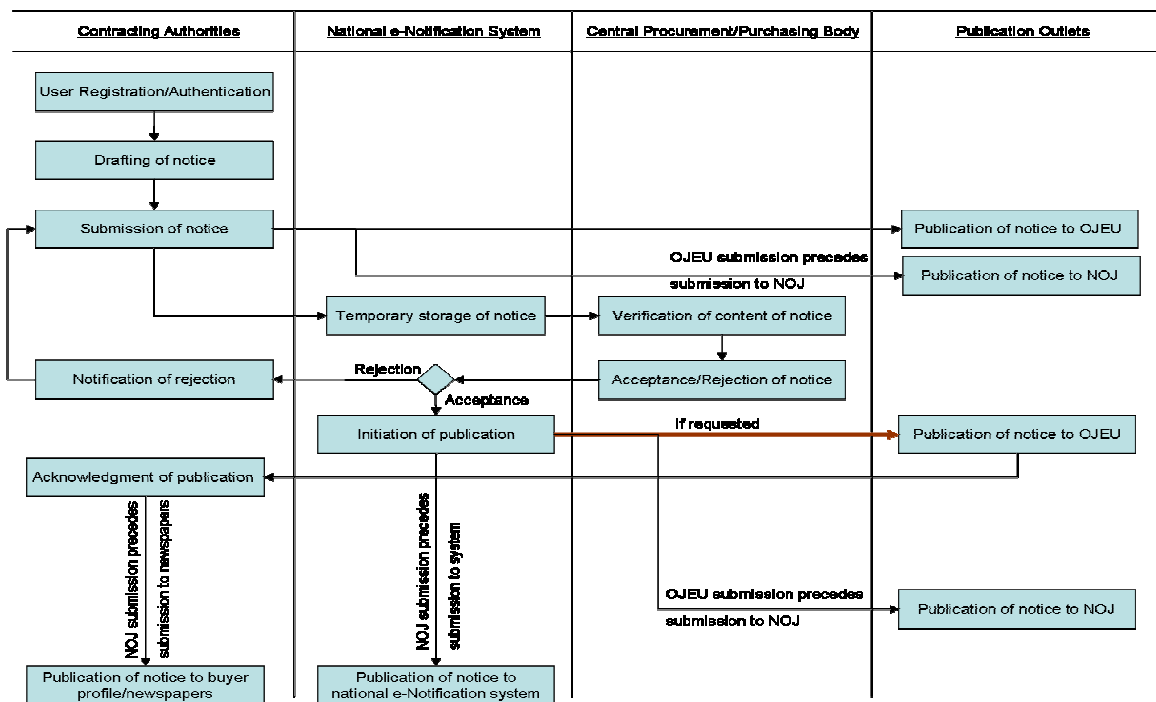


Figure 6: List of activities for Model B

The activities involved in the preparation, validation and submission of notices to all publication outlets comprise:

- **User registration and authentication:** A contracting authority uses the tools provided either by the national system, or the SIMAP online forms tools or any other private OJS e-Senders, in order to register and receive authorisation to use the system. The system may create a virtual workspace for editing, and administering the procurement notices. The level of security enforced for the identification of users by the different type of systems is the following:
 - o **National systems:** The level of security is considered low for Belgium, Bulgaria, Hungary, Italy Luxembourg, Poland medium for Malta, Sweden, United Kingdom and high for the Czech Republic, France, Latvia, and Spain
 - o **SIMAP online forms tools:** The level of security offered by the Publication Office is consider low since it si based on simple user credentials (username and password) provided automatically by the system
 - o **Private OJS e-Senders:** Different levels of security are provided by the OJS e-Senders ranging from low to medium level of security.
- **Drafting of notices:** Once registered in the system (national system, SIMAP online forms tools, OJS e-Senders), the contracting authority will prepare and draft the notice either using the online or offline tool by downloading the relevant notice forms. An initial verification is performed by the responsible procurement officer.
- **Submission of notice:** When drafted using the online tools of the system, the notice is submitted electronically to either to the national system or directly to OJEU using HTTP or Secure HTTP protocols, at which point the validation process is started. If applicable, notices are electronically signed prior to their submission. When the notices are electronically submitted to the national system or the OJS e-Sender, they are responsible for dispatching the notices to the National Official Journal, as well as to the OJEU or any other publication outlets, if requested.
- **Storage of notice:** Notices are stored in a secure location where only authorised personnel can have access to them. This is a basic functionality for the national systems and the SIMAP online forms tools, whereas for the OJS-e-Senders it may constitute an optional feature.

- Verification of content of notice: Verification and validation activities are performed by the personnel responsible either in the national e-Notification system or, if applicable, in the Central Purchasing/Procurement Bodies.
- Acceptance/Rejection of notice: A notice can either be accepted or rejected by the personnel responsible for verifying the content of its information.
- Notification of rejection: In case a notice is found erroneous or incomplete, the responsible body will send it back to the relevant contracting authority which, in an iterative manner will perform all activities needed for its correction and re-submission.
- Initiation of publication: Once validated and accepted, notices are dispatched for publication to the OJEU (for above threshold values) before being published in the National Official Journal (for both above and below threshold values).
- Acknowledgement of publication: Acknowledgement of publication is usually provided by the OJEU directly to contracting authorities or to the central e-Notification system in the form of an email message. Subsidiary publication may take place either in regional journals, buyer profiles or newspapers.

The activities involved in the preparation, validation and submission of notices to all publication outlets are almost identical with the ones described in the first model. An important difference between the first and the second model is that contracting authorities can submit their notices to the OJEU either directly and independently or through the national e-Notification system. The latter is generally responsible for dispatching the notices to the National Official Journal, as well as to the OJEU or any other publication outlets, if requested.

3.3 Model C – Fully decentralised

The third model presents a decentralised approach, where contracting authorities are free to submit their notices directly to the European/National Publication Outlets. In this case, contracting authorities have the complete responsibility for the validation of their notices.

The countries following this model are Austria, Cyprus, Denmark, Greece, Portugal, the Slovak Republic, Slovenia, Iceland, and Liechtenstein. Among these countries, only Austria use private and public OJS e-Senders for the preparation and submission of their procurement notices. All other countries mainly follow a traditional paper based approach (notices are exchanged either as a word document via email messages, or as a hard copy) for the preparation, validation and submission of procurement notices.

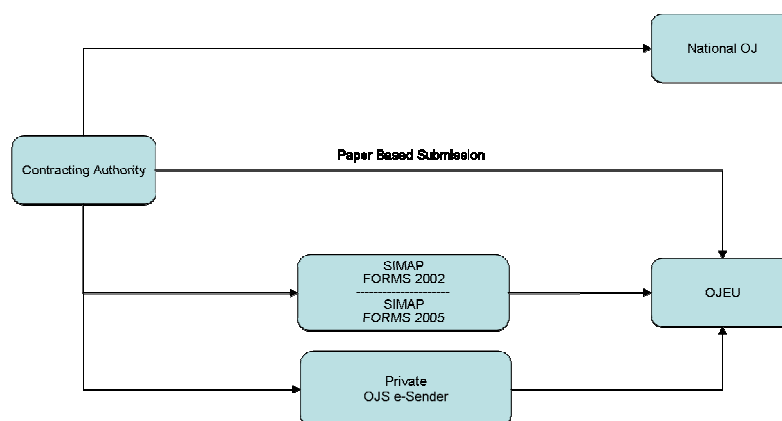


Figure 7: Model C – Fully decentralised

Contracting authorities in these countries use the best possible option that fits their budget and their needs for filling their procurement notices. The most popular options are the following:

- Use of a third party OJS e-Sender/commercial application offering web based tools for the drafting and submission of notices to the OJEU, as well as, for the publication of below threshold contracts.
- Use of the SIMAP online forms tools for the direct submission of procurement notices (using either the old or the new EC standard forms) to the OJEU.
- Use of a custom advertisement system integrated with the back office system of the contracting authority, adapted to the organisational needs of the contracting authority in question. This approach usually follows an offline preparation of procurement notices.
- Use of no application/system. Contracting authorities fill the EC standard forms offline using the paper based version of the EC standard forms.

In all four cases, contracting authorities are responsible for allocating a qualified (with adequate knowledge on the new public procurement legislation) procurement officer for the preparation of procurement notices.

Specifically, the countries under this model have a rather low to medium percentage of procurement notices submitted electronically in a structured format to the OJEU (Austria – 22%, Cyprus – 51%, Denmark – 52%, Greece – 33%, Portugal – 31%, Slovak Republic – 65%, Slovenia – 42%, Iceland – 63%, Liechtenstein – 25%)¹¹ as presented in Figure 8 below. Approximately 65% of all their notices are sent unstructured using traditional paper-based means.

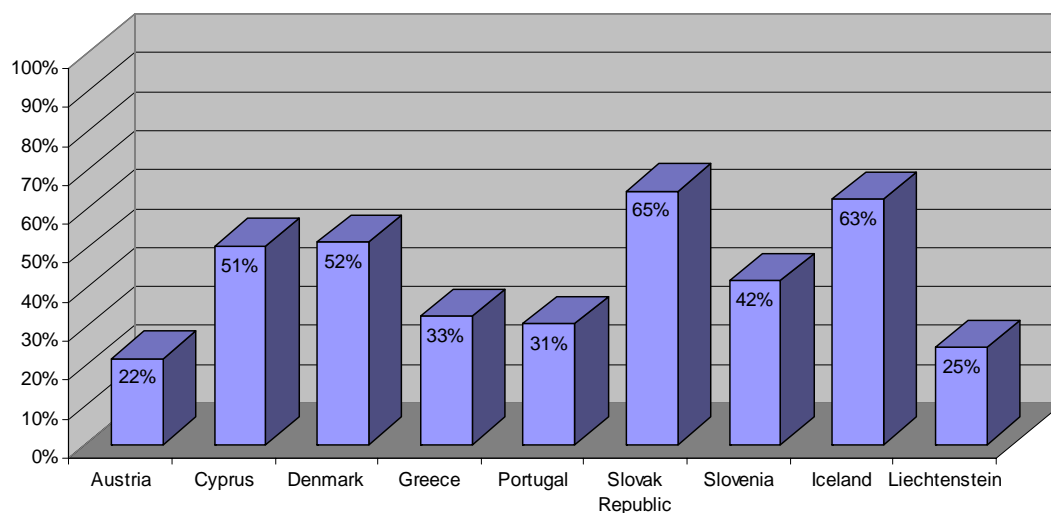


Figure 8: Model C - Notices submitted electronically to the OJEU in a structured format

All countries operating under this model are ranked below average in the e-Government readiness index of 2005. This justifies the significant difference between the percentage of structured electronic submissions supported by the other two models and the countries operating under this model.

¹¹ Statistical information on Public Procurement Notices published on TED – (Figures covering the third quarter of 2006) – OPOCE

Furthermore, in countries such as Sweden, there are no specific security requirements in place for the establishment of a user account, and for the advertisement of procurement notices. Users can register either online or offline depending on the e-Notification system. The system provides a distinct set of credentials (user name and password) either prior or after the validation of user information. The account closes in case the provided information does not represent the status of a legitimate contracting authority. In all other countries, there is a variety of security requirements (arising from the specifications of their future systems) starting from the use of simple user credentials up to the enforcement of electronic certificates.

Although countries¹² without an e-Notification/e-Procurement solution are working towards the implementation of their own system, Iceland has decided to await the results from the technical implementations and best practices from other countries, before deciding on a specific method of implementation. Knowledge and experience from other countries/organisations are collected through contacts/networks and via the internet.

Although the countries operating under this model are not currently benefiting from the advantages offered by a single nation-wide e-Notification solution, they are in a position where they can make a better decision and a more accurate plan regarding the design of the electronic system that will serve their needs. In addition, they can build on the experience gained by other countries operating under a fully centralised solution as well as adopt the most suitable of the current standards in the field. In the case these countries make the best choices available, there is a great probability that they will achieve such a performance which will outrun current leaders in the field.

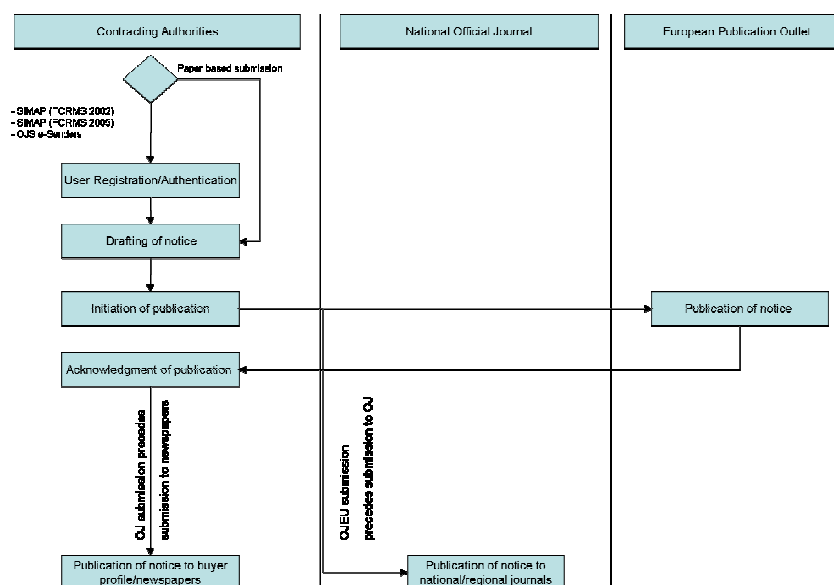


Figure 9: List of activities for Model C

¹² Austria, Cyprus, Greece, Portugal, the Slovak Republic, Slovenia, and Liechtenstein

The activities involved in the preparation, validation and submission of notices to all publication outlets comprise:

- *User registration and authentication:* A contracting authority must use the mechanism provided by the national e-Notification system, or by the SIMAP online forms (FORMS 2002 and FORMS 2005) or by a private OJS e-Sender, in order to register and receive authorisation to use the system. The latter creates a virtual workspace where notices are created and stored. In case of a paper based submission the user proceeds directly with the drafting of the notices.
- *Drafting of notices:* Once registered in the system, the contracting authority will prepare and draft the notice either using the online or offline tool by downloading the relevant notice forms. The verification is performed by the responsible procurement officer.
- *Initiation of publication:* Once the notices are validated by the contracting authorities and accepted by the system (if applicable), they are dispatched for publication directly by the contracting authorities to the OJEU (for above threshold values) before being published in the National Official Journal (for both above and below threshold values).
- *Acknowledgement of publication:* Acknowledgement of publication is usually provided by the OJEU directly to contracting authorities or to the central e-Notification system in the form of an email message. Subsidiary publication may take place either in regional journals, buyer profiles or newspapers.

4 Analysis of indicators

4.1 Legal readiness

The legal readiness indicator ensures the existence of a regulated landscape for the electronic submission of procurement notices across Europe in the 30 countries investigated. Within the context of the European Internal Market, competition policy aims to ensure wider consumer choice, technological innovation and effective price competition, thus contributing to both consumer welfare and to the competitiveness of European industry.

In particular, public procurement is a specialised branch of law that regulates how public bodies (or purchasers) buy supplies, works or services from other bodies (suppliers). The new EU public procurement Directives form the basis of a new regulatory framework across Europe setting, *inter alia*, requirements for the advertising of contracts via the publication of notices, which are currently supported not only in paper but also electronically in many European countries. The use of electronic means implies additionally the introduction of new rules as regards mainly shorter time-limits for publication, single or double publication requirements, etc. The provisions are slowly but steadily being introduced and implemented in all EU Member States, EEA and Acceding countries. Furthermore, the direct application of Commission Regulation (No 1564/2005) on the use of the new standard forms for the publication of procurement notices offers a concrete and obligatory tool aiming at the realisation of the electronic transmission of notices to the OJEU by all European countries. This is part of a wider EU strategy on computerising public procurement procedures in Europe.

Specifically, the publication of procurement notices for above threshold contracts has, since 2001, taken the shape of a common tool used at national and European level. Prior to that date, publication of notices at the OJEU was performed through the use of a variety of forms by different countries. Hence, each country remained free in the use of national forms for the publication of their public contracts at European level. The first common set of regulations (Directive "93/36/EEC – public supply contracts" and "93/37/EC –public works contracts" and "93/37/EC –water, energy, transport and telecommunications sectors") governing all aspects of public procurement only provided common advertising rules for the publication of notices. They did not however introduce standard notice forms. It was Commission Directive 2001/78/EC, which introduced the first set of standard forms for the publication of notices for contracts above EU thresholds (entered into force on 01/05/2002). As a result, most of the Member States took the necessary measures and adjusted their forms to comply with the EC standard forms. Within 2002, the first set of standard forms was available online in electronic format (word and PDF) along with an online form filling tool (SIMAP – FORMS 2002). In 2004, EU Directives 2004/17/EC and 2004/18/EC further introduced provisions regulating the public procurement landscape. Additionally, in 2005, Commission Regulation 1564/2005 and Directive 2005/51/EC standardised procurement notices on the basis of new forms, applying hence the principles set in Directives 2004/17/EC and 2004/18/EC for public contracts above EU thresholds. Subsequently, OPOCE implemented and launched the new standard notice forms in electronic format (word and PDF) along with an online form filling tool (SIMAP – FORMS 2005), thus facilitating the electronic transmission of notices to the OJEU and to TED.

Furthermore, contracting authorities have the option to submit their notices in a structured format not only using the SIMAP online form filling tools but also the OJS e-Senders XML interface. Within 2003, OPOCE introduced the first version of OJS e-Senders for the electronic submission of notices in a structured format (as an XML file). An OJS Exchange Protocol (OEXP) has since been developed which includes a set of Data Type Definitions (DTD) for the encoding of notices. An updated version of the Forms DTD became available at the end of 2005 for the support of the structured submission of the new forms. The new Forms DTD have been modified according to the new regulation and have become more sophisticated so as to cover the additional needs presented in the new standard forms. OPOCE provides all the necessary tools and guidelines for the introduction of the OJS e-Sender status. Nowadays, the majority of investigated countries have a public (e-Notification system) or a private OJS e-Sender supporting the submission of notices, using either the old and/or the new EC standard forms.

4.1.1 Definition of legal features and score per country

The criteria to be assessed in a tabular format are the following:

- Transposition of the new EU legislative package [30%]: Provides an indicator on whether transposition of all provisions on public procurement and specifically of e-Procurement has been completed and no lack of coherence between EU Directives and national laws exists. The timely or late implementation of the Directives is marked with a higher grade in the table below.
- E-Government provisions in force [30%]: Identifies the existence of national laws/regulations in force (e.g. special rules regulating e-Procurement) introducing all legal advances in the use of electronic means of communication in the field of public procurement (e.g. draft laws-action plans for the adoption of laws). Furthermore, it defines the legal validity of online transactions, of digital representation of data with respect to traditional means of representation, by both public and private distributors (e.g. digital signatures, PKI). The grading presents the extent of the legal, regulatory framework related to the development of public procurement in the table below.
- Simplicity of procurement notice publication [15%]: Identifies the existence of procurement mechanisms where double publication of procurement notices is mandatory both at the OJEU and at national level in a dedicated Official Journal or other such outlet for all European tendering procedures (above threshold contracts). Such mandatory double publications involve further activities and constraints than what is required in single publications to the OJEU. It usually increases the complexity of the organizational structure, the effort and expenses required for the publication of notices. Furthermore, it involves additional costs for contracting authorities, the State and the local Government.
- Use of standardized forms [25%]: Provides an indicator on the homogenization of forms for both above and below threshold contracts, the existence of national thresholds and electronic forms (compliant with the EU Directives) and the identification of existing regulations on the selection of the forms to be used (e.g. contract value). Furthermore, it provides an insight on the complexity of the procurement mechanism in the use of varying forms according to the contract characteristics. The level of similarity between the forms used for above thresholds and the ones used for below threshold contracts as well as the utilisation of a single set of standard forms for above threshold contracts are marked by a high (i.e. similarity) or low (i.e. differences) score in the table below.

The calculation of the legal readiness score is based on the results achieved under each criterion, where each criterion has a different weighting factor depicted according to their importance in the overall picture of legal readiness.

The formula for the calculation of the legal readiness for each investigated country independently is:

$$\text{Country } X = (C1_score * C1_weight) + (C2_score * C2_weight) + (C3_score * C3_weight) + (C4_score * C4_weight)$$

The score for each one of the 4 indicators (C1, C2, C3 and C4) ranges from 0 (lowest) to 5 (highest), picturing the status of readiness of each country. The weight for each one of the 4 indicators ranges from 0% (lowest) to 100% (highest).

The addition of all scores amount to the final legal readiness score for each individual country investigated, hence serving comparison purposes.

In the following table (Table 1), the legal readiness score is calculated on the basis of a multiple set of sub-indicators pointing out the regulatory framework in place in each investigated country.

Countries	Transposition of new EU Directives	e-Government Provisions	Simplicity of Notice Publication	Use of Standardized Forms	Legal Readiness Score (Total)
Austria	4	4	2	4	3,7
Belgium	2	3	2	2	2,3
Cyprus	5	3	2	2	3,2
Czech Republic	4	4	2	2	3,2
Denmark	5	5	4	2	4,1
Estonia	1	3	2	3	2,3
Finland	1	3	2	3	2,3
France	4	5	2	2	3,5
Germany	4	5	4	2	3,8
Greece	2	3	2	2	2,3
Hungary	4	4	2	2	3,2
Ireland	3	5	4	2	3,5
Italy	4	5	2	2	3,5
Latvia	5	3	2	2	3,2
Lithuania	5	3	2	2	3,2
Luxembourg	1	5	2	2	2,6
Malta	5	3	2	2	3,2
Netherlands	5	5	4	4	4,6
Poland	4	5	4	2	3,8
Portugal	1	4	2	2	2,3
Slovak Republic	3	3	2	4	3,1
Slovenia	2	3	2	2	2,3
Spain	1	5	2	2	2,6
Sweden	1	5	4	4	3,4
United Kingdom	5	5	4	4	4,6
Iceland	1	3	2	2	2,0
Liechtenstein	3	3	2	2	2,6
Norway	3	5	2	4	3,7
Bulgaria	4	3	2	2	2,9
Romania	4	3	2	2	2,9

Table 1: Legal readiness assessment per country

The investigated countries can be divided in three groups in respect to their legal readiness score:

- *Advanced countries (score above 4.0)*: It involves countries such as, Denmark, the Netherlands and the United Kingdom, which offer a wide regulatory legal framework for the support of the electronic public procurement processes.
- *Intermediate countries (score of 2.5 to 4.0)*: It involves countries such as Austria, Cyprus, the Czech Republic, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, the Slovak Republic, Spain, Sweden, Liechtenstein, Norway, Bulgaria, and Romania, which have aligned their legal framework to the main axes presented by EU objectives but have not yet regulated all aspects related to e-Procurement and specifically of e-Notification.
- *Developing countries (score below 2.5)*: It involves countries such as Belgium, Estonia, Finland, Greece, Portugal, Slovenia, and Iceland, which offer a legal/regulatory framework still in a transitional phase (i.e. complete transposition, resolution of legal obstacles, etc).

More than half of the investigated countries have implemented the EU legislative package into their national laws. In these countries, the transposition was completed with no significant delays. In the same context, in the Netherlands and the United Kingdom, the new legislative package was directly transposed as by law. The remaining countries are expected to complete transposition within 2007.

In the context of the transposition of the new legislative package, the investigated countries have taken steps in the introduction of electronic means of communication in the field of public procurement to a varying degree, thus picturing differences in their “e-Government” legal readiness status. Focus is generally put on the development, revision, or extension of the countries’ national laws/regulations in force, in order to remove deficiencies and realise a fully functional public procurement. However, most of the countries are not legally bound in the use of electronic tools and options available, hence leaving the use of e-Government services and in particular of e-Procurement at their discretionary power. Action plans are formulated on a national or European level for providing recommendations to those countries concerned on how to do more but the implementation of such plans varies from country to country. As opposed, countries such as Estonia or Romania are bound by law to submit their procurement notices solely using electronic means.

The old EC standard forms are still in use in addition to the new ones in a large number of investigated countries. At the end of the third quarter of 2006, the use of the old EC standard forms represented more than 14% of the procurement notices submitted to the OJEU. The use of the old EC standard forms several months after the introduction of the new EC standard forms indicates that the transposition process is not yet complete. Another observation is the lack of clarity and understanding of many contracting authorities throughout the countries investigated regarding the new requirements imposed by the new standard EC forms. The majority of investigated countries use two separate sets of forms for the drafting of their procurement notices, covering both above and below threshold contracts. Although both these sets for above and below threshold values are usually based on the standard EC forms, implementation in the investigated countries is never identical.

4.1.2 Critical issues/ obstacles and opportunity-type elements

A detailed description of the critical issues and obstacles is described in the sections below along with the opportunity-type elements picturing the legal readiness status of each investigated country.

4.1.2.1 Transposition of new EU legislative package

The development of public procurement and improvement of the functioning of the European Internal Market enabling the EU Member States, EEA and Acceding countries to fully reap the benefits is directly connected to the correct and swift implementation of the new procurement Directives.

Transposition of the new Directives in national legislations is a mandatory process for all EU Member States, EEA and Acceding countries. Apart from a legal obligation though, transposition is an important leap towards more transparency, competition and uniformity among European countries in the use of electronic means for the transmission and advertisement of procurement notices. Transposition or yet again, the lack thereof constitutes a weakness or even a problem for countries according to the nature of difficulties encountered during the implementation process which in turn may lead to barriers to cross-border trade, distortion of competition and lack of rapid development of e-Procurement. Particularly, a country, which has not yet completed the transposition, may be:

- Waiting for the law to enter into force (e.g. voted but not yet in force)
- Need to perform minor or more important adjustments for full compliance with the Directives (specific legal provisions)
- Facing difficulties of organisational/political or other nature hindering the prompt transposition of the legislative package

4.1.2.2 Existence of e-Government/e-Procurement provisions in force

The legal framework regulating the public procurement sector at national level encompasses not only the implementation of the EU legislative package but also all the national laws and regulations (part of the national procurement law or separate legal acts) on e-Procurement valid in each investigated country. Additional provisions setting the requirements for publication of contracts via the advertisement of procurement notices, beyond the legal framework presented in the new Directives is hence left to each European country's discretion, according to its needs and legal system/principles. Thus, some countries such as Germany or Finland have expanded the scope of regulation of e-Procurement by introducing a multitude of legal provisions which set out clearly the conditions of notice publication along with all the protection measures (e.g. transmission protocols, access rights management, virus protection, digital certificates, etc), while others have only begun to take legal steps in that direction (e.g. Liechtenstein, Bulgaria, Malta, the Slovak Republic).

Enhanced regularisation of e-Procurement in a given country indicates not only the importance given to the field, the level of development of the sector, but also the security dimension as apprehended by people. Particularly, a country, which has foreseen the existence of such e-Procurement provisions, may have voted for specific regulations as an integral part of the general procurement framework in force at national level (France and Germany as examples). A country may also have provided for such rules within the context of the public procurement law applicable (Ireland, Spain, Bulgaria, and Romania as examples). Lastly, a country that has only begun to regulate the e-Procurement field, may have not yet provided specific rules within the national public procurement law or independent legal act regarding the use of electronic means of communication in the tendering process (Liechtenstein and Iceland as examples).

Although almost all the investigated countries have established a regulatory regime with special policies and rules for the secure and efficient execution of the different phases of e-Procurement, there is still a lack of cross-border interoperability among the regimes in fields such as standardisation, trust, and security. In the area of user identification and authentication, there is a limited e-Signatures interoperability (technical and functional). The only countries currently working towards the direction of e-Signatures interoperability are Austria, France, Germany, Italy, Estonia, Sweden, Denmark, Finland, Bulgaria, and Romania.

As an example, the introduction and use of eID cards vary from one country to another since there is no European policy yet for their implementation. In the majority of investigated countries, the eID cards are supplied on demand except for Belgium and Estonia, where the use of eID cards is compulsory by law. The mandatory use and integration of the eID card within the public procurement process of those two countries has increased the level of security, interoperability, and transparency between the State and local Governments.

Furthermore, in terms of e-Government provisions and in particular regarding electronic signatures, one of the most important aspects is the legal background for their use by businesses. In this direction, all Member States have successfully transposed the e-Signature Directive (1999/93/EC) into their national legislation. In addition, electronic signatures are often accepted as legally equivalent to conventional handwritten signatures and are thus admissible as evidence in legal proceedings. However, there seems to be some confusion in the interpretation of the Directive, which is related to both the national legislative level and the actual users of electronic signatures. As such, the situation regarding the practical use of e-Signatures in the Member States varies. There exists a group of countries, such as Austria, Estonia, Finland, Lithuania, and the Netherlands, which present a relatively high penetration of electronic signatures in business transactions. These countries share common characteristics in terms of the existence of an official Government strategy for the introduction of electronic signatures and have further adopted common standards guiding the use of electronic signatures and introduction of the Public Key Infrastructure (PKI). Following the rank of e-Signature use rates, there is a wider group of countries presenting a relatively adequate e-Signature use profile. This group includes the Czech Republic, Denmark, France, Hungary, Ireland, Luxembourg, Poland, The Slovak Republic, Spain, and Sweden. In most of these countries, although not all supportive measures are coincidentally present, certificates as defined in the e-Signature Directive are already being issued. Finally, a third group of countries is populated by Cyprus, Malta, and Slovenia. Although these countries have already transposed the respective Directive into their national legal system, they are presented to be idle as far as the evolution of the rest of the required features is concerned. It is apparent hence that the low level of e-Signature adoption in business transactions in these countries is relevant to the level of development of e-Business services and systems in general.

From a more general framework, a fundamental aspect that drives development in e-Government services is the existence or lack of a strategic plan for future actions as well as of a more long-term vision describing the goals that should be met. Although there exists an overall strategy of the EU in the context of the Lisbon Agenda and in the i2010 e-Government Action Plan where more specific aspects are addressed, there are significant variations in the national strategies set by each Member State individually. There are several possible reasons for these variations: Different ways of interpreting the EU strategy; different levels of ICT development between Member States; different backgrounds regarding the use and adoption of new technologies and especially of ICT; different economic profiles; different orders of magnitude regarding business transactions between the public and the private sectors, etc.

More ambitious strategies are globally defined by countries, which have already accomplished a significant level of development in the area of e-Government and e-Services in general. These countries seem to plan future actions a step further in order to stay inline with the ever-evolving technological environment and to benefit from every new possibility arising from technological progress. In these countries, new ideas are generated during this process of constantly pursuing the modernization of civil services, which are then rendered as best practices and are followed by the rest of the Member States. Notable strategies are currently set by Denmark, Finland, France, Sweden, the UK and Norway. It is expected that the realization of these strategies will maintain the lead of these countries when compared to the rest of the European States in terms of the level of e-Government services provided. Intermediately ambitious strategies are set by countries that are in the process of converging with the more advanced ones discussed above. Such strategies are set by Austria, Belgium, the Czech Republic, Estonia, Luxembourg, the Netherlands, Spain and Iceland. The less advanced countries among European States present more moderate visions stating future steps regarding the development of e-Government. In most cases, other more fundamental infrastructure-related issues must firstly be resolved in order to plan for more complex and technologically demanding services. This drives future plans to prioritize on more essential issues such as developing an adequate ICT infrastructure, promoting new technologies and raising awareness on the advantages offered by their use. This group of countries comprises Cyprus, Greece, Latvia, the Slovak Republic, Slovenia, Bulgaria and Romania.

4.1.2.3 Double publication obligation of procurement notices

The publication process for procurement notices may present a multi-faceted set of requirements, which may render the process long and cumbersome. The legislation in force in a given country may provide for publication to take place in one or more publication outlets at a national and European level. Among the investigated countries, the majority (23 out of 30) have a double publication requirement for the advertisement of their notices. From the remaining seven countries (Denmark, Germany, Ireland, the Netherlands, Poland¹³, Sweden, and United Kingdom), two of them (the Netherlands and the United Kingdom) do not have a NOJ, whereas the remaining five do not require the submission of procurement notices to their NOJ. The procurement mechanism in countries where double publication of procurement notices is mandatory, involves further regulatory activities and constraints than in those that require only a single OJEU publication. The publication requirement in question may furthermore be mandatory or not. The electronic and/or paper-based publication may also be a prerequisite or not for the lawful publication of procurement notices. The addition of all these requirements is representative to a certain degree of the complexity and steps involved for conducting properly the publication of procurement notices for above threshold public contracts. Most importantly, it introduces additional costs for contracting authorities, the State and the local Government.

However, in certain countries, the publication of procurement notices may require a simple process of single publication. Hence, the additional publication at national level in a dedicated National or Regional Official Journal may appear to be obsolete. The simplified publication requirement renders a clearer and faster procedure. This approach is followed by Sweden, Poland, the Netherlands and the United Kingdom, which are not obliged to publish procurement notices in a dedicated NOJ, as well as Finland where the NOJ plays also the role of the national e-Notification system. A similar approach is followed by Romania, where the submission to the NOJ will continue until all contracting authorities are capable to use correctly and efficiently the national e-Notification system; in which case, submission to the NOJ will cease to be obligatory.

4.1.2.4 Use of standardized forms for procurement notices

The increasing use of homogenized forms for the publication of notices both at European and national level is a rather recent development. Although the use of standard EC forms was optional initially, it became a prerequisite for public contracts above EU thresholds. Below-threshold contracts remain governed by the internal legislation of each country. Hence, the use of common or different forms for the publication of notices belongs to the discretionary power of each country in question.

¹³ The system of publication of notices in Poland has recently been changed since the entry into force of the new provisions on 25 May 2006 (amendments to the Public Procurement Law). As a result, with regard to Polish contracts above EU thresholds, publication now takes place only at the EU level (OJEU). Therefore, the internal publication system is no longer used for the publication of notices covered by EU law.

Furthermore, the use of national forms for the publication of notices at national level, in particular for below threshold contracts may be similar, with minor differences or significantly different from the EC standard forms used for publication at the OJEU for any given country. Differences in the templates used for above threshold contracts and the ones used for below threshold contracts are usually related to the specific national needs of each country. Almost all the investigated countries maintain two different sets of forms for above and below threshold contracts, usually with minor (Austria, Estonia, Finland, the Netherlands, the Slovak Republic, Slovenia, Sweden, United Kingdom, Norway) or significant differences (Belgium, Cyprus, Czech Republic, Denmark, France, Germany, Hungary, Greece, Italy, Latvia, Ireland, Lithuania, Luxembourg, Malta, Poland, Portugal, Spain, Iceland, Liechtenstein, Bulgaria, Romania) from the EC standard forms. Countries obliged by law to submit their procurement notices to their national e-Notification system (if applicable) are also responsible for enforcing, maintaining and making available a common set of forms (usually for both above and below threshold contracts) to all contracting authorities. In this case, changes brought to the forms require significant investment by the State/local Government and possible amendments to national laws. Specifically, for countries following a fully decentralised approach, contracting authorities are responsible for utilising the best possible option that fits their budget and needs. However, this approach creates administrative overheads since different contracting authorities may utilise different sets of forms offering different validation tools and security requirements. In general, national forms for below EU threshold contracts are simpler in terms of content and more straight-forward in their completion and understanding.

It is also worth to be mentioned that with the Commission Regulation (No 1564/2005) on standard forms, public contracting authorities benefit not just from greater competition but also from a shorter streamlined procedure with one single set of online notice forms, which can save them valuable time in the procurement process. The greatest advantage of the new forms further comes with the online use. If submitted electronically, notices can be published on TED within five days of being sent instead of the former twelve days. In addition, this is expected to reduce significantly paper-handling costs for administrations and to facilitate the processing of tender information.

4.2 E-Notification solution

The existence of an e-Notification system and its features are obviously strongly associated to the ability of a country to adopt up-to-date solutions and follow EU objectives. The experience of having developed such a system is invaluable and places the corresponding countries in an advantageous position as regards the modernisation efforts made in the field of e-Procurement. The advantage is even more important when in addition to e-Notification there is an overall e-Procurement system in place. This will also ensure a significant level of adoption of new systems since there already is a user community of existing solutions.

4.2.1 Definition of e-Notification features and score per country

The criteria to be assessed in a tabular format are the following:

- Existence of an electronic notification system or overall e-Procurement system [25%]: Identification of the existence of an e-Notification system or overall e-Procurement system. The use of +/- indicates the level of development/completion of such system further emphasizing whether the latter serves only notification purposes or general e-Procurement services.
- Supported functionality [10%]: Identification of the level of advancement of the supporting tools for the execution of all phases of the e-Notification process (drafting, validating, and submitting).
- Level of security [20%]: Identification of the level of protection of the environment in which procurement notices are drafted, transmitted, and published.
- Existence of infrastructure (hardware/software) [25%]: Identification of available infrastructure supporting all phases of the e-Notification process (drafting, validating, and submitting).
- Effectiveness of system [20%]: Identification of the nature of the link between the existence of an e-Notification system and its use made by the contracting authorities procuring through the system in question (legal obligation or on a voluntary basis).

The calculation of the e-Notification solution score is based on the results achieved under each criterion, where each criterion has a different weighting factor depicted according to their importance in the overall picture of the e-Notification solution.

The formula for the calculation of the e-Notification solution for each investigated country independently is:

$$\text{Country } X = (C1_score * C1_weight) + (C2_score * C2_weight) + (C3_score * C3_weight) + (C4_score * C4_weight) + (C5_score * C5_weight)$$

The score for each one of the 5 indicators (C1, C2, C3, C4, and C5) ranges from 0 (lowest) to 5 (highest), picturing the status, existence and effectiveness of the e-Notification solution in use in each country. The weight for each one of the 5 indicators ranges from 0% (lowest) to 100% (highest).

The addition of all scores amount to the final e-Notification solution score for each country investigated, hence serving comparison purposes.

In the following table (Table 2), the e-Notification solution score indicates the ranking of each country corresponding to the criteria described above.

Countries	e-Notification System	Functionality in Use	Level of Security	Existence of Infrastructure	Effectiveness of System	e-Notification Solution Score (Total)
Austria	2	3	3	4	1	2,6
Belgium	5	5	4	4	3	4,2
Cyprus	2	3	2	3	1	2,2
Czech Republic	5	5	4	3	4	4,1
Denmark	4	3	2	5	5	4,0
Estonia	4	3	2	3	3	3,1
Finland	4	5	5	4	5	4,5
France	5	5	5	4	5	4,8
Germany	5	5	5	4	5	4,8
Greece	2	2	3	2	1	2,0
Hungary	4	2	3	3	3	3,2
Ireland	5	5	5	4	5	4,8
Italy	5	3	4	3	3	3,7
Latvia	5	3	3	3	3	3,5
Lithuania	5	4	3	3	3	3,6
Luxembourg	5	5	5	4	5	4,8
Malta	3	2	2	2	2	2,3
Netherlands	5	5	5	4	5	4,8
Poland	5	3	2	2	3	3,1
Portugal	3	2	2	3	2	2,5
Slovak Republic	2	1	1	2	1	1,5
Slovenia	2	1	1	3	1	1,8
Spain	5	3	3	3	3	3,5
Sweden	5	4	4	5	5	4,7
United Kingdom	4	5	4	5	5	4,6
Iceland	2	1	1	4	1	2,0
Liechtenstein	1	1	1	2	1	1,3
Norway	5	5	5	4	5	4,8
Bulgaria	4	4	3	1	2	2,7
Romania	4	4	2	2	2	2,7

Table 2: E-Notification assessment per country

The investigated countries can be divided in three groups in respect to their e-Notification assessment score:

- Advanced countries (score of 4.0 and above): This group includes countries such as Belgium, the Czech Republic, Denmark, Finland, France, Germany, Ireland, Luxembourg, the Netherlands, Sweden, United Kingdom, and Norway, which already have an e-Notification system in use with increased functionality, the level of security is advanced and the overall efficiency of the system is above the average.
- Intermediate countries (score of 2.5 to 3.9): This group includes countries such as Austria, Estonia, Italy, Hungary, Latvia, Lithuania, Poland, Portugal, Spain, Bulgaria, and Romania, which have an e-Notification solution at an intermediate level, an intermediate level of security as well as overall efficiency.
- Developing countries (score of 2.4 and below): In this group belong countries such as Cyprus, Greece, the Slovak Republic, Slovenia, Malta, Iceland, and Liechtenstein with no operational e-Notification system or with a system under current development.

As an initial observation, one may conclude that the overall score in the North-West part of Europe (e.g. Finland, France, and Sweden) is very high in comparison to the score achieved in the rest of Europe with countries such as Slovenia, the Slovak Republic, or Malta at the bottom of the list. The existence of an e-Notification system usually implies an advanced supported functionality in the execution of the notification phase.

As regards the countries without an existing integrated e-Notification solution, it should be noted that the majority of them are in a position that allows them to quickly develop such solutions since in most cases the first steps towards this goal have already been taken (e.g. independent partial solutions needing to be integrated, legal environment). An interesting observation in this context may be that the Acceding countries (Bulgaria and Romania) have practically completed and implemented full-fledged e-Notification systems in contrast to older members of the EU (Austria, Greece) which still have not adopted such systems.

The ratio of e-Notification solution existence with the effectiveness achieved is a measure that can be exploited in order to spot deficiencies and incompatibilities in the overall solution. In this manner, countries with existing e-Notification solutions can realise small or bigger adjustments to their procedures in order to achieve the desired performance.

4.2.2 Critical issues/ obstacles and opportunity-type elements

A detailed description of the critical issues/obstacles and the opportunity type elements describing the ability of a country to adopt up-to-date solutions and follow EU objectives is described in the sections below.

4.2.2.1 E-Notification system in use

Most of the e-Notification systems in the investigated countries offer a simple, direct and freeform environment for the online and offline preparation and submission of procurement notices. However, there are countries such as Germany, where contracting authorities must first subscribe to the e-Notification service before obtaining the proprietary hardware and/or software with which to communicate with the service in question. Such an implementation provides moderate accessibility due to additional prerequisites/effort needed on the part of the contracting authorities. This can be characterised as a constraint since not all contracting authorities have the capacity to obtain, the knowledge to use and maintain a proprietary hardware and/or software.

Although all the investigated countries share the same EU principles and objectives on open standards, many of the current e-Notification systems however are implemented on proprietary solutions, which do not easily interoperate with other services and systems. Furthermore, the utilization of proprietary solutions includes additional requirements to be satisfied regarding the use of hardware and software by contracting authorities for accessing the e-Notification systems in question. The lack of open source software and standards reduces the overall accessibility, efficiency and interoperability of such e-Notification system. In the same context, the lack of such implementation is critical to the successful electronic submission of procurement notices since there are no reliable communication services for the electronic exchange of information/messages between contracting authorities and the e-Notification system in question.

Access to any given e-Notification system may become problematic when there is a lack of technical (e.g. software technologies, operating systems), semantic (format, grammar, syntax and organizational (e.g. communication, cooperation, and collaboration) interoperability among all interested parties (e.g. contracting authorities; National Official Journals; other publication outlets). The lack of an efficient e-Notification system may hold back and increase the costs involved in the standardisation of procurement processes for the preparation, validation, approval, and submission of procurement notices. Countries such as Cyprus, Greece, the Slovak Republic, Slovakia, Denmark, and Austria have identified the weaknesses of their current organisational framework and the potential savings from the introduction of a national e-Notification system. They also have identified and resolved the associated legal and technological hurdles and are currently working towards the deployment of their e-Notification services, expected to be operational within the next 2 to 3 years (2007- 2009).

The presence of an e-Notification system does not necessarily imply its efficiency and acceptance by contracting authorities. Countries such as Estonia or Portugal have already deployed pilot e-Notification systems based on the partial implementation of Directive 2004/18/EC and the principles presented thereof. However, several system implementation constraints (i.e. requirements, functionality, usability, security, etc.) and the lack of funds/investment prevent the immediate commercial deployment and use of such systems.

The lack of adaptability and maintainability may also affect the viability of an existing e-Notification system. Belgium is an example, where major re-engineering is required in order to overcome the constraints and drawbacks from the proprietary implementation of the standard (EC and national) forms and to make the system interoperable and functional no matter which forms are opted for.

Furthermore, in countries such as Slovenia or the Slovak Republic, although a conceptual model based on EU guidelines has been established there are no adequate personnel and technical resources/infrastructure (i.e. software, hardware, telecommunication systems) for its implementation. The problem further appears to be a blocking factor for countries such as Liechtenstein or Iceland where, in addition to the adequate resources and infrastructure needed, there is neither medium/long term investment nor implementation plans for the establishment of an e-Notification system. However, these two countries have chosen to wait for the technical implementation results and best practices of other countries, before deciding on a specific method of implementation.

Besides the critical issues involved in the implementation and use of a national e-Notification system, countries with an already implemented system have an overall competitive advantage over the countries which are still in the development phase of such a system. A significant leap in terms of technical features is the use of modern technologies (i.e. J2EE platform and Microsoft .NET framework) and open standards in the implementation of the e-Notification solutions. Such solutions are based on a standardised organisational framework which increases interoperability among contracting authorities by providing a structured format for the electronic exchange of procurement notices. Furthermore, efficiency of the notification process is increased and adaptability as well as extensibility of the provided services are supported with minimum effort and cost.

Widely accepted/adopted e-Notification systems, operating either on a national or regional level in countries such as Finland, Ireland, Lithuania, and Norway may be considered as good role models by countries that are still in the implementation phase of their e-Notification system. The contracting authorities responsible for the implementation of the e-Notification system may avoid reinventing the wheel and benefit from the re-use of proven solutions and common practices (SIMAP forms tool; OJS e-Senders, etc.) currently in place. Such approach may be considered as the optimal solution especially in cases where there is a lack of knowledge and skills of the procurement personnel or general national financial restrictions in the implementation of the e-Notification systems.

4.2.2.2 Functionality in use

Most of the investigated countries realised their e-Notification systems (if applicable) prior to the publication of the new legislative package on public procurement. As a result, further adaptations are required at the legal, organisational and technical level for the current e-Notification systems to become fully compliant with the terms of the new legislative package as well as with the new EC standard forms. Another important limitation in the current implementation of such solutions throughout many of the investigated countries is the lack of available guidelines and online help tools for assisting procurement officers to complete and submit their notices without mistakes.

In general terms, it is observed that the current e-Notification systems experience significant constraints due to the lack of certain online tools (i.e. user management, multilingual support, interactive online help, etc.) and processes (i.e. validation, approval, acknowledgement, etc.) required for the preparation, validation, and submission of notices by contracting authorities. Limitations are also encountered in the business process involved for the validation of procurement notices, which targets only the automatic verification of mandatory fields, dates and numeric values, without supporting any workflow activities. Also, manual interaction (e.g. manual entry and repetition of information) for the completion of the e-Notification phase and the lack of monitoring and auditing facilities may cause internal delays and additional costs. Typical examples are Austria and Slovenia, which operate under a fully decentralised model without any assistance from a Central Procurement Body.

One of the main drawbacks in the implementation of almost all the e-Notification systems in the countries concerned is the low level of security applied for the identification, authentication, and authorisation of the users involved in the e-Notification process. The lack of a sufficient level of authorisation/authentication (checking of user credentials and rights) may allow anyone with access to the system to use a false identity. Another important blocking factor may be in the current e-Notification systems proposed by some of the countries investigated, the lack of a structured electronic submission to the OJEU, NOJ and/or ROJ.

Despite the complexity and the drawbacks on the use of a national e-Notification system, the existence of such a system in a given country provides however the option for contracting authorities to select the best available tools for the online and/or offline drafting, validation and submission of procurement notices. The advantage of a mandatory submission compared to an optional one is the existence and enforcement of a common set of rules regulating the e-Notification phases at national level applicable to all contracting authorities in a uniform fashion. Furthermore, it provides an additional level of validation of the actual content of notices before publication on the advertisement portal or to the OJEU by procurement experts.

One of the reasons implying the efficient use of such a mandatory e-Notification system is the existence of common tools and committees responsible for the monitoring and auditing of the process and activities performed by contracting authorities for the preparation, approval, submission and award of public contracts. The committees use this option to identify possible problems in the execution of the e-Notification processes and take part in their resolution by improving the guidelines provided to contracting authorities for the use of the system and coordination of activities (e.g. organization of training courses). Countries such as Ireland, Finland, France, and the Netherlands that provide a secure, efficient and cost/time effective e-Notification environment accommodating the needs of all contracting authorities at national level, have achieved a high degree (more than 80%) of electronic submission of structured notice forms.

The automation of the organisation processes represents an advantage for the preparation, validation, approval, and submission of procurement notices. Countries such as Germany, France, and Ireland provide interactive online help tools for the automation of notification processes and the enforcement of workflow activities. They also provide tools for the creation and management of user profiles based on distinct organisational roles and access rights.

Additional support tools are also presented by countries such as Belgium, the Czech Republic, Finland, and Ireland in order to avoid incomplete or incorrect notices. These tools assist contracting authorities in adjusting their organizational structure to the processes and activities supported by a common workflow based on national requirements and laws. Commercial systems use various predefined management structures based on the organisational needs of each individual contracting authority.

The best possible solution for the full automation of the organisation processes supported by different contracting authorities is the existence of an e-Notification system capable of adapting its internal management structure to the organisational needs of each individual contracting authority.

In a nutshell, one could consider that all of the above opportunity-type elements constitute strong points towards achieving a fully automated validation process, which will eventually eliminate mistakes, drawbacks and in turn reduce both time consumption and costs.

4.2.2.3 Level of security

Access to the national e-Notification systems is restricted to authorised users through the submission of user credentials. Only 20% of the investigated countries (Czech Republic, France, Germany, Lithuania, Spain, and Romania) use advanced/qualified electronic signatures, whereas the remaining 80% use basic authentication, based on a username and password. Although almost all the investigated countries have already transposed the electronic signature Directive (1999/93/EC), their implementation process experiences significant delays due to technical challenges arising from the complexity of the PKI infrastructure and technical interoperability at national and international level.

The monitoring of the activities performed by contracting authorities when using the e-Notification services necessitate the existence of an adequate audit trailing framework to ensure the effective recording of all necessary information, while meeting all legal and regulatory obligations enforced by national laws. The ineffective monitoring of the approval processes and activities of the different user profiles may lead to significant inconsistencies in the application of policies and execution of activities (legal and organisational). This reduces significantly the cost-effectiveness of the e-Notification system/solution and hence transparency.

In addition, a significant limitation in the monitoring and auditing of the e-Notification processes is the absence of user profiles associated with distinct access rights. The lack of properly defined user profiles restrain the control of the application throughout the different phases of the approval process since all the users have access to every activity. The lack of secured communication (PKI and e-ID cards supporting advanced qualified certificates) may hence be considered as a problem for countries which require the use of advanced and qualified electronic signatures for the approval process. On this basis, the lack of user/contracting authority identification, prevention and protection mechanism may be considered as a blocking factor in terms of security regarding e-Notification services since the latter require a significant amount of effort and money which may simply be unavailable.

4.2.2.4 Existence of infrastructure

The majority of investigated countries have invested significant financial resources over the last decade to provide their State procurement units (i.e. Ministries and ministerial offices), State and local Government bodies and publicly-owned enterprises with the appropriate technological tools (i.e. software and hardware). However, nowadays the investment in question is considered to be insufficient for the majority of investigated central European countries (i.e. Lithuania, Latvia, Poland, Slovakia, Romania, and Bulgaria) due to the significant changes in technology and the new technical requirements introduced by the latest commercial browsers.

The development of such e-Notification systems was completed in an isolated environment taking into account only the requirements of the specific country they were adopted in or the needs of the procurement body responsible for implementation. These solutions experience constraints limiting as such their integration capabilities with other external systems and rendering current or future information technology and system needs hard to maintain. They also experience significant limitations in their evolution since they require dedicated human resources with expertise on proprietary systems and old stand-alone technologies.

Additionally, budget constraints affect the establishment of a common, integrated, information technology architecture and communications infrastructure, across the rural and urban areas of the investigated countries. Unless such an issue is resolved, it will be difficult to install an integrated computerization architecture across these countries enabling the electronic submission of procurement notices. The lack of modern systems (software/hardware), along with the poor internet connectivity and the inadequately trained staff mainly in the rural areas, may also constitute a blocking factor for the proper deployment and use of e-Notification services by contracting authorities in all of the countries concerned.

The existence of a modern ICT infrastructure is one of the most critical elements required for the electronic submission of procurement notices. Standardisation, confidentiality, and equal treatment are also important for the electronic exchange of notices over the e-Notification system. Countries such as Austria, Belgium, Denmark France, and Germany have identified requirements and implemented guidelines for the technical implementation (e.g. infrastructure) and interaction of their procurement systems with qualified Trust Centres/Certification Authorities. The existence and application of such specificities assure all participating parties that the transactions they perform are properly traceable and accountable and their identity can therefore not be altered. Furthermore, these countries use data protection tools for the encryption of the information exchanged and/or stored in the e-Notification system.

The use of advanced/qualified electronic signatures is an option for countries such as the Czech Republic, France, Germany, Lithuania, Spain, and Romania which enforce an additional level of security in their systems. This option becomes a real strength especially when the solution implemented is simple to use, with no supplementary dependencies or expensive software and hardware requirements. Other Member States may use the implementation guidelines for designing or improving their own ICT infrastructure for the support of electronic signatures.

Furthermore, interoperability among the different electronic ID cards is currently available in many of the investigated countries and especially in Austria, Belgium, Estonia, Finland, and Germany. It can be used for integrating easily with the security infrastructure of the e-Notification system in place in each of the countries concerned. Contracting authorities have the option to use electronic ID cards and smart card readers from third party suppliers which offers them an interface with their operating systems.

4.2.2.5 Effectiveness of system

Aspects related to structure, content, downloading speed, feedback and communication between user and site, along with user assistance are essential for the usability of an e-Notification system. Although it seems to be a minor weakness for a simple website, the lack of an intuitive and user-friendly interface for an e-Notification system may increase the complexity and confusion of the solution in its entirety and become a constraint or even a problem for its wide adoption and use. Furthermore, the lack of user-friendliness results into an increase of mistakes mainly during the validation phase of procurement notices. The lack thereof usually brings about additional operational costs for training and helpdesk activities.

Mistakes also arise from the unintentional execution of activities, covering mainly the approval process of procurement notices. The lack of a consistent workflow, guiding the different user profiles throughout the different phases of e-Notification, may cause significant delays in the approval and publication of notices. The need for a consistent workflow is especially important in large contracting authorities with multiple levels of internal validation processes. Where no such consistent workflow exists, constraints related to efficiency and cost effective operation may be experienced. Furthermore, it may generate for all contracting authorities additional costs in the maintenance of the e-Notification solution, due to the need to maintain multiple organisational processes.

The adoption and use of the current e-Notification systems is held back by their limited services and supported functionality. Other important factors with a serious impact on the effectiveness of the majority of the e-Notification system/solution are the lack of reliability and of training regarding the use of the solution, as well as, supplementary operational and maintenance costs.

The current constraints experienced by the different contracting authorities have raised the need for standard cross platform services supporting the drafting, approval and submission of notices to the OJEU and the NOJ independently of their technical capacity. In that context, countries such as the Czech Republic provide to contracting authorities different options and tools (i.e. online, editor, offline editor, XML interface) for the electronic submission of their notices to the e-Notification system.

Furthermore, the presence of interactive online services/tools (i.e. interactive help, virtual help desk, and structured workflow) are considered as essential elements for the assistance of contracting authorities in the completion and approval process of their procurement notices. The strength of such tools is the effective transfer of knowledge to the contracting authorities and the interactive validation of all the steps performed by the different user profiles. These tools aid contracting authorities in their activities in respect of the legal and organisational requirements enforced by national laws and the system as such. These tools, in turn reduce the time and cost required for the training of the personnel. Another important factor in the efficiency of the system in a country is the existence of a security framework supporting all the e-Notification processes and activities, in a modular form that can easily be extended or replaced according to the rules imposed by the legal and organisational setting.

Briefly, one may generally consider that the access to any given e-Notification system may become problematic when there is a lack of technical (e.g. software technologies, operating systems), semantic (format, grammar, syntax and organizational (e.g. communication, cooperation, and collaboration) interoperability among all interested parties (e.g. contracting authorities; National Official Journals; other publication outlets).

4.3 ICT readiness

ICT readiness is an indicator reflecting not only the quality of the technological infrastructure of a country but also the maturity, span and penetration of the applications and services provided. Furthermore, ICT readiness is dependent on the respective human resources capacity as well as on the social willingness and interest of people in the use of ICT. This in turn, is closely associated to the educational system and the existing opportunities for society to use ICT solutions. At a national level, these aspects are strongly related to the political vision of the Government and the initiatives taken in order to develop efficiently the ICT infrastructure and sufficiently support the penetration of the corresponding solutions and systems.

ICT readiness is a development indicator measured at national level. It is further studied at an international level serving thus comparison purposes between countries.

4.3.1 Definition of ICT features and score per country

The criteria to be assessed in a tabular format are the following:

- ICT infrastructure [25%]: Identification of the ICT infrastructure (software and hardware) currently in place within the investigated countries for the support and development of e-Government services, with special focus on e-Procurement services.
- Regional discrepancies [20%]: Identification of the current ICT development among regions within the investigated countries (e.g. paralleled with differences in regional development). The demographic and geographic conditions of different areas, accompanied by the distribution of economic activities may represent a strong bias in the rollout of ICT infrastructure if left to the market alone.
- ICT skills of population [15%]: Identification of the level of ICT skills of the population as a whole.
- Procurement ICT skills [25%]: Identification of the level of procurement ICT skills of the e-Government personnel (e.g. training programmes available- efforts made for interpreting the law).
- Social willingness in the use of ICT [15%]: Covers both the culture of information and knowledge sharing between all interested parties. The interest and proactive stance of people towards the use of ICT has a direct effect on the sustainability of e-Government and the general political direction opted for by the Government of any given country.

The calculation of the ICT readiness score is based on the results achieved under each criterion, where each criterion has a different weighting factor depicted according to their importance in the overall picture of ICT readiness.

The formula for the calculation of the ICT readiness for each investigated country independently is:

$$\text{Country } X = (C1_score * C1_weight) + (C2_score * C2_weight) + (C3_score * C3_weight) + (C4_score * C4_weight) + (C5_score * C5_weight)$$

The score for each one of the 5 indicators (C1, C2, C3, C4 and C5) ranges from 0 (lowest) to 5 (highest), picturing the status of readiness of each country. The weight for each one of the 5 indicators ranges from 0% (lowest) to 100% (highest).

The addition of all scores amount to the final ICT readiness score for each country investigated, serving hence comparison purposes.

Countries	ICT Infrastructure	Regional Discrepancies	ICT Skills of Population	Procurement ICT Skills	Social Willingness in the Use of ICT	ICT Readiness Score (Total)
Austria	5	3	3	3	5	3,8
Belgium	5	3	3	3	4	3,7
Cyprus	2	2	2	3	3	2,4
Czech Republic	3	2	2	3	3	2,7
Denmark	5	4	5	5	5	4,8
Estonia	2	2	3	3	3	2,6
Finland	5	4	4	5	5	4,7
France	5	5	4	4	4	4,5
Germany	5	5	4	4	5	4,6
Greece	2	2	2	1	2	1,8
Hungary	2	1	2	1	2	1,6
Ireland	3	3	3	3	3	3,0
Italy	3	2	2	3	2	2,5
Latvia	1	2	1	1	2	1,4
Lithuania	2	2	2	2	2	2,0
Luxembourg	4	4	4	5	5	4,4
Malta	3	5	3	3	3	3,4
Netherlands	5	4	4	3	3	3,9
Poland	1	1	2	2	2	1,6
Portugal	3	2	1	1	2	1,9
Slovak Republic	1	2	2	2	3	1,9
Slovenia	2	2	2	2	3	2,2
Spain	3	2	2	3	3	2,7
Sweden	5	4	5	5	5	4,8
United Kingdom	5	5	4	5	5	4,9
Iceland	3	4	5	5	5	4,3
Liechtenstein	4	5	5	5	3	4,5
Norway	5	5	4	5	5	4,9
Bulgaria	1	1	1	1	2	1,2
Romania	1	1	1	1	2	1,2

Table 3: ICT readiness assessment per country

In Table 3, the ICT readiness total score indicates the ranking of each country corresponding to the criteria described above. The 30 investigated countries can be divided in three groups in respect to their ICT total score:

- Advanced countries (score of 4.0 and above): This country group comprises Denmark, Finland, France, Germany, Luxembourg, Liechtenstein, Sweden, United Kingdom, Iceland, and Norway, where an advanced ICT infrastructure exists; no regional discrepancies are present; the skills of the population are advanced in terms of both ICT and procurement and in addition there is a significant level of social willingness in the use of ICT.
- Intermediate countries (score of 2.5 to 3.9): This group includes Austria, Belgium, the Czech Republic, Estonia, Ireland, Italy, Malta, the Netherlands, and Spain, countries which present an intermediate ICT infrastructure; negligible regional discrepancies; and an intermediate level as regards the population skills in terms of ICT and procurement.
- Developing countries (score of 2.4 and below): The countries that belong to this group are Cyprus, Greece, Hungary, Latvia, Lithuania, Poland, Portugal, the Slovak Republic, Slovenia, Bulgaria, and Romania. These countries have an insufficient ICT infrastructure while in parallel they lack of general population ICT skills.

Observing the table above, there are some remarks that should be extracted and pointed out linking the ICT readiness assessment to other national characteristics that have a direct impact on the categorisation presented.

More specifically, it is noted that ICT readiness is closely associated to the economic profile of each country. Among the 30 European countries investigated, the ones that present the highest total score in ICT readiness are generally considered to belong to the most economically advanced countries in Europe. In this respect, countries that have the lowest score in ICT readiness also present a weaker economic background.

Additionally, one can initially observe that countries among the founding members of the European Union and EU15 countries in general, are more advanced in terms of ICT when compared to newer members of the EU25, and far more advanced when compared to the Acceding countries. EEA countries also hold a leading position in terms of ICT development in Europe. ICT development has further been promoted by the relevant EU legislation and funding which led to the creation of an important ICT infrastructure in those aforementioned countries.

It should also be noted that there are indications that the technological background of a country in terms of the ICT industry is an aspect that strongly affects its ICT readiness total score. It can be observed that countries such as Finland and Sweden that hold a remarkable position in ICT production worldwide also have among the highest ICT readiness scores while other countries that have a negligible ICT industry are among those with the lowest score.

4.3.2 Critical issues/ obstacles and opportunity-type elements

The objective of the ICT readiness analysis is to identify specific actions for improvement and potential niches for the initial start up of e-Government programs, rather than a positive or negative answer to e-Government as a whole.

A detailed description of the critical issues /obstacles and opportunity-type elements related to ICT readiness in the countries investigated is described in the sections below.

4.3.2.1 Human resource capacity and ICT skills of population

The level of ICT readiness of a country is greatly related and affected by the human resource and organisational capacity, as well as by the knowledge of public administrators and servants on new processes (i.e. tools and procedures) and technologies. In this context, the lack of specialized skills of public administrators and servants is a significant constraint that hinders the effective collaboration as well as the development of the ICT infrastructure and the provision of e-Government services. Countries facing such issues are for instance Latvia, Lithuania, Poland, Portugal, Bulgaria and Romania. In addition, the potential insufficiency of the general population in terms of technological skills is a factor that has a negative impact on the adoption of new electronic procurement systems. ICT in general and more specifically the use of new technologies require constant training. The lack of respective funds could result in the decline of the quality of services provided even in countries where a satisfying level of ICT development is currently in order. The effective management of the above issues is dependent on the formulation of a human resources strategic plan suitable for identifying the resources and guiding their development.

As such, improving the ICT skills of the general population results in the availability of more specialized personnel in the public sector. One of the key factors for the economic growth and competitiveness of a country is the wide availability of human resources with the right knowledge, ICT skills and expertise on public procurement. Such skills are also essential for high penetration and adoption rates for e-Government systems and services. When the majority of the population is computer literate, the time needed for public administrations to promote and for economic operators to accept the use of e-Government systems/services is hence significantly decreased. The development of new and advanced systems and services is also dependent on the overall level of ICT literacy. These advantages have been identified by several countries, such as Denmark, Sweden, Iceland and Liechtenstein, where the level of ICT skills of the population is very high as a result of the adoption of an efficient educational policy and investment in ICT training.

4.3.2.2 ICT infrastructure and interoperability measures

In general, one can say that the low level of ICT infrastructure is identified among the most important reasons for the inefficient development and poor penetration of e-Government services. As such, the lack of suitable information and communication networks is a blocking factor when promoting electronic services. However, not all the investigated countries have reached an optimum level of ICT infrastructure. Countries with such insufficiencies are for instance Latvia, Poland, the Slovak Republic, Bulgaria and Romania. The fast pace of ICT evolution also requires a flexible updating and upgrading strategy. Otherwise, performance and efficiency will constantly decrease.

In the same context, achieving interoperability between different systems provides the basis for the establishment of common guidelines and workflows for the coordination of e-Notification activities among contracting authorities. It also supports the electronic exchange of standardised messages between contracting authorities, National Publication Outlets and the OJEU. Interoperability features, which are delivered mainly through the adoption of open and widely acceptable ICT standards and the existence of centralised databases, result in cost-effective technological advances. Countries that have achieved significant interoperability features are those that have also invested in the development of an advanced ICT infrastructure. Such countries are for example Austria, Belgium, Denmark, Finland, France, Germany, Sweden, UK and Norway.

4.3.2.3 ICT regional discrepancies

Since procurement procedures are governed by national legislation and therefore affect a country as a whole, the lack of uniformity in the ICT infrastructure is a significant aspect of delay in the deployment of e-Government services. In most of the investigated countries and especially in the less economically advanced ones, there is a significantly different level of ICT development between the urban and the rural regions, a phenomenon described as “Digital Divide”. This situation could potentially be a blocking factor for the general penetration of already developed e-Government services at a national level. A significant “Digital Divide” is present in Hungary, Poland, Bulgaria and Romania and measures should be taken in order for this potential blocking factor to be resolved.

In contrast however, the geographic homogeneity observed in certain countries such as Luxembourg, France, Germany, the United Kingdom, Norway, or Belgium in the use of ICT serves one of the main reasons for effective ICT development of the countries in question and the reduction of the existing regional “digital divide”. Geographic homogeneity thus distributes in a fairer way the resources available and the knowledge of the responsible personnel leading the countries in question to hold a stronger position in terms of ICT development and progress.

4.3.2.4 Procurement ICT and managerial skills of personnel

The ICT training of public sector employees is essential for the effective implementation of e-Procurement systems. Countries that have invested in e-Procurement training of the public sector employees are for example Denmark, Finland, Luxembourg, Sweden, the United Kingdom, Iceland, Liechtenstein and Norway. The performance of e-Procurement systems may not be uniform or further be hindered when the respective training is scattered and lacks adequate organisation. Also the lack of specialized teaching personnel on procurement issues imposes serious delays and low quality services. These situations often arise due to limited financial resources available for the coordination of training activities. Training should be constant and in line with ICT and legislative developments in the public procurement sector in order to achieve the desirable results.

Furthermore, the decision to involve public sector employees with managerial skills in e-Government services can promote organisational structure and processes within contracting authorities. Such skills are appropriate in order to assist understanding and to adopt new electronic public procurement policies and practices. Countries that present a satisfying level of public employees’ e-Procurement skills are Denmark, Finland, Luxembourg, Sweden, the United Kingdom, Liechtenstein, Iceland and Norway.

4.3.2.5 Social willingness/interest in the use of ICT

Social willingness and interest in the use of ICT provide a positive overall attitude especially towards the introduction of new technologies required for the use of e-Government applications. However, since e-Procurement systems involve both the public sector as buyers and the private sector as suppliers essentially, the level of interest in the use of novel technologies should be increased in society as a whole. A satisfying level of interest in the use of ICT is found for instance in Austria, Denmark, Finland, Germany, Luxembourg, Sweden, the United Kingdom and Norway. The lack of ICT related courses in the primary and secondary educational systems in parallel to the limited leisure time of adults is one of the main reasons for the existing lack of ICT skills observed across Europe in a varying degree, and mostly in Greece, Hungary, Italy, Latvia, Lithuania, Poland, Portugal, Bulgaria and Romania. In addition, the lack of voluntary participation in ICT seminars and adult educational programmes is a preventive factor from keeping up to date with the ever-evolving ICT environment.

However, the provision of training on ICT and all the e-Procurement system functionalities can achieve a maximised effect when addressed to public sector employees with a positive attitude and adaptability to change. In this way, ICT pilot projects can be launched in order to customise and implement a secure on-line electronic procurement platform operating as a single access point for the whole user chain (i.e. procurement officers, private sector suppliers, etc.). The features described above are essential in order to initiate, implement and sustain e-Government solutions as well as to keep up-to-date with both technical and legal developments at European level.

In this same context, the adoption of proactive governmental policies for the promotion and development of ICT in general also provides a fertile environment for taking up e-Government initiatives and elaborating common strategies in the area of computerisation of the State and the public sector. In this manner, in-time planning of actions and initiatives is made feasible and specific deadlines are set – and kept – regarding the launch of e-Government solutions since the required financing is in parallel included in the corresponding budget allocated for this purpose.

4.3.3 E-Identification and Security infrastructure

Security issues play a vital role in the overall effectiveness and reliability of e-Notification solutions. The required security can initially be established through the implementation of e-Identification systems for the whole user community which also performs the necessary authentication and authorisation. In addition, a reliable data storage and data exchange system should exist in order for the solution to cover the respective legal protection prerequisites. Furthermore, reliability is closely connected to the efficient elimination of computer virus threats through the incorporation of appropriate antivirus software. Finally, correct and unalterable time stamping of actions must also be guaranteed by the e-Notification solution. The implementation of a reliable security system is the basis for meeting the necessary principles of equal treatment, non-discrimination and transparency no matter what e-Notification solution is finally opted for in the investigated countries.

4.3.4 Definition of security infrastructure features and score per country

The criteria to be assessed in a tabular format are the following:

- Identification of contracting authorities [15%]: Covers the level of security involved and prescribed by law for the identification of contracting authorities within the national e-Notification system (when applicable), other alternative e-Notification solution or traditional paper-based notification mechanism for the submission of notices. It also covers the level of security involved for the identification of the procurement officers within each individual contracting authority involved in the preparation, review, and approval of notices.
- Internal Validation [20%]: Identifies the level of security measures enforced by contracting authorities for the preparation, review, and approval of their notices. It involves the use of manual and electronic processes independently from the existence of a national e-Notification system.
- System Validation [10%]: Identifies the level of security measures and the efficiency of the processes enforced by the national e-Notification system for the validation of the notices submitted to the system for publication.
- Monitoring and Auditing [10%]: Identifies the procedures followed for audit trailing and registering of all the activities performed by the procurement officers within each individual contracting authority for the preparation, review, and approval of notices.
- Existence of PKI and e-ID cards [30%]: Covers the range of security services available for the recognition of user profiles.
- Security “culture” [15%]: Identifies the general conception of people as regards security matters which further serves as a baseline for developing new strategic policies at governmental level.

The calculation of the e-Identification and security infrastructure score is based on the results achieved under each criterion, where each criterion has a different weighting factor depicted according to their importance in the overall picture of the e-Identification and security infrastructure in each of the investigated countries independently.

The formula for the calculation of the e-Identification and security infrastructure for each investigated country independently is:

$$\text{Country } X = (C1_score * C1_weight) + (C2_score * C2_weight) + (C3_score * C3_weight) + (C4_score * C4_weight) + (C5_score * C5_weight) + (C6_score * C6_weight)$$

The score for each one of the 6 indicators (C1, C2, C3, C4, C5, and C6) ranges from 0 (lowest) to 5 (highest), picturing the status, existence and effectiveness of the e-Identification and security infrastructure in use in each country. The weight for each one of the 6 indicators ranges from 0% (lowest) to 100% (highest). The addition of all scores amount to the final e-Identification and security infrastructure score for each country investigated, hence serving comparison purposes.

Countries	Identification of Contracting Authorities	Internal Validation	System Validation	Monitoring & Auditing	Existence/use of PKI & e-ID cards	Security Awareness	Security Infrastructure Score (Total)
Austria	3	3	3	4	5	5	4,0
Belgium	3	3	4	3	5	5	4,0
Cyprus	3	1	1	3	1	3	1,8
Czech Republic	5	3	3	5	3	3	3,5
Denmark	3	4	3	5	5	5	4,3
Estonia	3	3	5	5	4	3	3,7
Finland	3	4	5	5	5	5	4,5
France	5	4	5	5	4	5	4,5
Germany	5	4	4	5	5	5	4,7
Greece	3	1	1	2	2	3	2,0
Hungary	3	2	3	3	1	3	2,2
Ireland	3	1	1	2	1	3	1,7
Italy	3	3	5	5	3	3	3,4
Latvia	3	2	3	3	3	3	2,8
Lithuania	5	2	5	5	3	2	3,4
Luxembourg	3	1	3	3	3	4	2,8
Malta	3	2	3	2	1	2	2,0
Netherlands	3	3	5	5	3	4	3,6
Poland	3	2	3	3	1	3	2,2
Portugal	3	1	1	2	3	2	2,2
Slovak Republic	3	1	1	2	1	1	1,4
Slovenia	3	1	1	2	3	2	2,2
Spain	3	3	3	3	3	4	3,2
Sweden	3	4	3	3	3	5	3,5
United Kingdom	4	3	4	2	3	5	3,5
Iceland	3	4	5	5	3	4	3,8
Liechtenstein	3	1	1	2	1	3	1,7
Norway	3	3	5	3	3	4	3,4
Bulgaria	3	3	4	3	2	2	2,7
Romania	4	3	4	4	2	1	2,8

Table 4: Security infrastructure assessment per country

The e-Identification and security infrastructure score is calculated on the basis of a multiple set of sub-indicators pointing out the level of protection provided by the environment in which procurement notices are drafted, transmitted, and published in each investigated country. The investigated countries can be divided in three groups in respect to their e-Identification and security infrastructure score:

- *Advanced countries (score of 4.0 and above):* It involves countries such as Austria, Belgium, Denmark, Finland, France, and Germany, which have put in place an established security framework for the support of an effective user identification and hence offer an adequate/high level of security within their national e-Notification system, other alternative e-Notification solution or traditional paper-based notification mechanism.
- *Intermediate countries (score of 2.5 to 3.9):* It involves countries such as, the Czech Republic, Estonia, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Spain, Sweden, Romania, the United Kingdom, Iceland, Norway Bulgaria and Romania, which are in the process of finalising their security infrastructure in order to integrate it within their national e-Notification system, other alternative e-Notification solution or traditional paper-based notification mechanism.
- *Developing countries (score of 2.4 and below):* It involves countries such as Cyprus, Greece, Hungary, Ireland, Malta, Poland, Portugal, the Slovak Republic, Slovenia, and Liechtenstein which have identified requirements and currently are in the process of developing their security framework and infrastructure along with their e-Notification/e-Procurement solution.

Although the majority of investigated countries have already in place a modern security infrastructure in place, such infrastructure is not widely used throughout the e-Notification phase. Countries in possession of an advanced security infrastructure based on electronic signatures are additionally distinguished from the rest for their progress in the field of ICT readiness and the quality of their existing e-Notification systems (e.g. Belgium, Denmark, Finland, France, and Germany). This is an expected phenomenon since security “culture” is developed where the use of e-Services in general and more specifically of e-Government solutions go back a long way. Security “culture” is the driving force for the adoption of the appropriate security mechanisms and the development of the necessary tools in each case separately.

Furthermore, the level of security infrastructure is generally observed to be associated to the economic background of the countries investigated. Another aspect driving security mechanisms development is the adoption of EU Directives on public procurement where the principles of equal treatment, non-discrimination, and transparency are essential. The relatively big number of countries with a developing security system points out the necessity of better promoting security issues since these seem to be, to a certain degree, neglected.

4.3.5 Critical issues / obstacles and opportunity-type elements

A detailed description of the critical issues /obstacles and opportunity-type elements related to the e-Identification and security infrastructure capacity in the countries investigated is described in the sections below.

4.3.5.1 Identification of contracting authorities

The e-signature interoperability is efficiently promoted only in few of the investigated countries (Germany, Italy, Estonia, Sweden, Denmark, and Finland). The majority of investigated countries with national e-Notification systems in place offer a basic user authentication mechanism to restrict access to system resources. Users are authenticated based on a simple set of credentials (i.e. username and password) which are either selected by the users during their registration or generated and distributed automatically. This is an implementation weakness, since it may authorise users to access system resources prior to their actual validation/confirmation of identity, which is in conflict with the requirements of EU Directives on the use of electronic means.

Countries such as Belgium, the Czech Republic, France, Ireland, Poland, and Norway use multiple user profiles with distinct access rights, reflecting the organisation chart of each contracting authority. Such an implementation provides a secure environment with various authorisation levels (e.g. full control, edit, update, deletion, etc.) that protect the information exchanged and stored on the e-Notification data repository/database.

Most of the national e-Notification systems use functional roles, covering at least the profile of the “system administrator” with access to all the supported processes and activities and the “application user” profile with access to all the processes and activities related to the drafting, validation, approval, and submission of notices. However, contracting authorities as such use organisational roles that fit the needs of their daily operations.

The lack of such organisational roles, customised to the needs of each individual contracting authority, may become a constraint for the wide adoption of an e-Notification system. This is so, because it requires significant investment (e.g. training, reallocation of resources, etc.) from the part of the contracting authorities, in order to adapt their internal organisational structure and activities to the management model and processes supported by the e-Notification system.

In this area, Poland and Bulgaria have a significant advantage compared to other countries, since they have implemented an advanced user management module for controlling (granting and monitoring) physical access to the system. The administrative personnel of each contracting authority has the option to use an existing hierarchical structure or create a new one based on the needs of the individual contracting authority. This offers contracting authorities the option to adapt their processes and activities to those supported by the e-Notification system.

Furthermore, the lack of an e-Notification system indicates the alternative use either of the SIMAP online tools, private OJS e-Senders or a manual/paper based approach for the preparation and approval of procurement notices for publication. The SIMAP online forms enforce a low level of security for the identification of users. It is based on simple credentials (username and password) provided by the users along with a system generated transaction number used for verifying the email account during the users’ first login. This approach may introduce potential problems since anyone could publish a procurement notice, without any physical identification required. A more advanced level of user identification is offered by OJS e-Senders. OPOCE requires the physical identification of the OJS e-Senders in order to be able to follow with the submission of notices.

Furthermore, in the case of a paper based approach, physical identification of the involved persons is enforced based on their handwritten signatures (e.g. with further validation of signatures by a notary in many countries). The authorisation and identification of the people in this case scenario can be characterised as human dependent, where an intentional or unintentional mistake may lead to important security gaps and potential corruption.

4.3.5.2 Internal Validation/Integrity and privacy of information stored on the system

The procedures and security requirements followed by contracting authorities for the internal drafting, validation and approval process of procurement notices depend on their individual needs which are not completely standardised yet. The content management tools offered by the e-Notification systems in many of the investigated countries and the SIMAP online tools are generally limited to the simple storage and retrieval of notices. Usually, all users have access to the procurement notices stored on the system by a particular contracting authority. There are also cases where users have concurrent access and editing privileges on the same document. The lack of organizational profiles for accessing/modifying the information stored on the system along with the missing categorisation (i.e. public, private) of data constitutes a major weakness for the use of the system. This is so, because the content of notices can be altered unintentionally at any point prior to submission for publication.

Although practically all the e-Notification systems have implemented a secure network configuration, only few of them (e.g. Germany) have been approved by their national security agency. The lack of an efficient intrusion detection system capable of detecting modifications on the content and the status of notices may lead to a serious constraint when a notice may be submitted for publication without proper approval. Furthermore, another serious constraint affecting the privacy of information of users in all the existing e-Notification systems is the encryption of information. The lack of encryption may allow access and possible modifications brought about to the content of notices by unauthorised users who, by this means get direct access to the database.

Contracting authorities follow the rules incorporated on the online tools and editors available by each individual solution for the drafting and publication of notices. However, in most cases (i.e. SIMAP online tools, national e-Notification systems with limited functionality), the internal processes for the preparation, validation and approval of notices are executed either offline using manual processes or online with limited security protection. The documents are exchanged between the different procurement officers in a paper based format and only the final version of the approved notices is uploaded on the system for direct submission. In such cases, there is repetition of information, possibly leading to mistakes due to the retyping of information and the unstructured communication established between the involved users.

4.3.5.3 System Validation/ integrity and privacy of information exchanged

Countries without a national e-Notification system (e.g. Austria, Cyprus, Greece, Malta, Portugal, the Slovak Republic, Slovenia, Sweden, United Kingdom, Iceland, and Liechtenstein) rely on the communication interface provided by their solution provider (i.e. OJS e-Senders) for the submission of notices to the OJEU. There are also cases in almost all of the investigated countries where contracting authorities submit their notices in an unstructured format (i.e. paper, fax, email).

For countries with an e-Notification system, communication between contracting authorities and the applicable system is usually performed through an unencrypted communication channel where the use of electronic signatures is not mandatory. For countries such as Germany, where the use of advanced electronic signatures is mandatory, the e-Notification system should be able to accommodate all contracting authorities independently of their capacity (e.g. PC, internet browser, etc). The enforcement of advanced security measures (e.g. qualified signatures) may potentially cause organisational problems excluding contracting authorities from accessing and using the e-Notification systems. This is more visible especially in small contracting authorities with limited technological expertise and limited financial resources to acquire and use electronic certificates.

There are also countries such as the Czech Republic, Estonia, France, Germany, Lithuania, Spain, and Romania, which use a secure communication framework based on the existing PKI infrastructure for the encryption and decryption of procurement notices as well as for digitally signing them. However, this approach involves delays due to several prerequisites needed to be completed by contracting authorities as well as technical expertise and additional financial resources for the purchase of qualified certificates for procurement officers.

Furthermore, it has been identified that the lack of efficient communication tools and PKI infrastructure supporting interoperability and cross-border electronic exchange of information between contracting authorities and any e-Notification system may potentially put into risk the wide acceptance of such e-Notification solution. The same applies for the communication of any e-Notification system with the OJEU or any other National Publication Outlet.

4.3.5.4 Monitoring and auditing facilities

Almost all the e-Notification solutions provide monitoring and reporting tools for the follow-up of processes and activities performed by the participating parties (i.e. contracting authorities, administrative personnel, auditing personnel, etc) throughout the different phases of e-Notification. The reports keep record of the information gathered on administrative activities (i.e. drafting, validation, approval, and submission of procurement notices), technical activities (i.e. discrepancies and error messages recorded by the system during the e-Notification process), and auditing activities (i.e. system and user activities recorded on the audit trailing logs until the archiving of procurement notices). Among all investigated countries, Germany has implemented one of the most advanced infrastructures for monitoring and recording the activities performed on the national e-Notification system by the different actors. The German e-Notification system also provides a time stamping service for the delivery of a qualified/official (secure, certifiable, and auditable) time stamp indicating the precise time of creation or the last modification to the electronic document submitted on the e-Notification platform. The implementation of the auditing and time stamping service are both based on the specifications provided by the Federal Office for Information Security (BSI).

Furthermore, a virus detection facility is used by countries such as Finland, France, and Ireland in order to protect their system from virus-infected documents.

The existence of a technical advisory body (i.e. Belgium, Finland, France, Germany, and the United Kingdom) and of an auditing body (i.e. Austria, Germany, Luxemburg, the Slovak Republic, Sweden, Romania) provide these countries with a competitive advantage, since there are already established standards and procedures for the implementation and the monitoring of the e-Notification processes and activities. However, small countries where there is no such technical advisory body may use the findings of other leading countries in the field, without allocating extra time or effort.

Access to the monitoring and reporting tools is managed by the system based on the access rights allocated to each user profile. Only the administrative personnel along with the procurement officers responsible for the administration of a particular notice are capable of following-up the progress/history of all the activities performed during the life-cycle of the notice in question (e.g. drafting, validation, approval, or/ and rejection).

4.3.5.5 Existence/use of PKI & e-ID cards

The practical use of e-Signatures in the Member States varies. There are countries, such as Austria, Belgium, Estonia, Finland, France, and Germany which present a relatively high penetration of electronic signatures in business transactions, and countries such as Cyprus, Greece, Ireland, Latvia, Lithuania, Luxemburg, Poland, Portugal, Bulgaria, and Romania without a PKI infrastructure. The remaining countries have in place a basic PKI infrastructure supporting the use of advanced electronic signatures in existing governmental services.

For countries with an existing PKI infrastructure, the use of electronic certificates can easily be incorporated in their current or future e-Notification systems, whereas its absence constitutes an obstacle. The delay in the implementation of a PKI infrastructure is mainly related with interoperability, financial and technical aspects. The lack of interoperability is encountered due to an inadequate set of complex standards for the implementation and management of electronic certificates; the absence of Certification Authorities for the creation and revocation of advanced certificates; financial problems are concentrated on the high implementation and promotional costs; whereas the technical issues are related with the knowledge and skills of the responsible people.

The use of electronic certificates is one of the pillars of the e-Identification policy followed by the Czech Republic, France, Germany, Lithuania, Spain, and Romania on their e-Notification systems. They use electronic certificates in order to enhance the security used by their e-Notification system for the exchange and storage of electronic documents and information related to the publication of notices. Simple and/or advanced (software based) certificates can be found in the implementation of the e-Notification system of the Czech Republic, France, Lithuania, Spain, and Romania for the identification of the procurement officers working within each contracting authority in order to have access to the system and the tools available to their profile. Qualified (smart cards and smart card readers) certificates are currently used only in Germany for the identification of procurement officers as well as for digitally signing and encrypting the notices uploaded on the e-Notification system.

Advanced electronic certificates in the form of e-ID cards are available in Austria, Belgium, Estonia, Finland, Italy, Slovenia, Spain and Sweden and soon expected in countries such as France, the Netherlands, Germany, Latvia, Lithuania, Malta, Poland, Portugal and United Kingdom. The remaining countries do not have current plans for the implementation of e-ID cards. The main reasons for the delay of such implementation are also the lack of cross border interoperability and recognition, as well as, the involved costs.

Electronic certificates are also used by the Web/application servers, in order to establish a secure communication layer (SSL) with the client Web browsers for their encrypted exchange of data. The certificates are used with the HTTPS protocol so as to provide server authentication, data confidentiality, data integrity, as well as, to authenticate the Web clients of the contracting authorities.

4.3.5.6 Security culture/awareness

The security culture and awareness of public servants is a major issue, perceived as a barrier to the introduction of an interoperable service for the electronic submission of procurement notices. Countries such as Bulgaria, Portugal, Malta, Slovenia, Romania, and the Slovak Republic are still currently working on usability, presentation, and pricing issues for the introduction of electronic security to contracting authorities.

The majority of investigated countries have incorporated specific programs on security issues at their universities. In some countries (United Kingdom, Sweden), training is also offered by institutions from the private sector. Some other countries (e.g. Finland, France, Germany, and Spain) have created specialised bodies in the public sector for providing seminars on security information and training to government employees.

Co-operative efforts with bodies from the business and government sector have been made from countries such as Austria, Germany, Denmark, and Norway for the creation of security policies and handbooks covering the development and promotion of technical and management standards.

Furthermore countries such as Denmark, Finland, France, Germany, Portugal, the Slovak Republic Spain, the Netherlands, Norway, and the United Kingdom have incorporated into their national strategy issues related to the development of security policies (guidelines and processes), security culture, and professional skills at national level.

4.4 Financial impact

The financial impact provides an overall overview of the various qualitative features which may be considered in assessing the implementation of an e-Notification system for the electronic submission of procurement notices, compared to alternative e-Notification solutions or traditional paper-based procurement procedures.

It identifies the potential positive effects (e.g. efficiency, cost savings) and financial (development and training costs) investments compared to the situation prior to the implementation of a national e-Notification system. It considers investment costs for the State and local Government, as well as for the contracting authorities in terms of hardware, software, and other equipment/ services. Furthermore, it identifies financial incentives for contracting authorities on how to improve ICT/procurement skills, adopt new procurement practices, and avoid financial risks that would affect the introduction of a mandatory electronic submission of procurement notices.

All the direct (i.e. software tools/hardware equipment), and indirect (i.e. training, IT support) costs involved in the development and maintenance of an e-Notification solution are expressed as common sense estimations due to the lack of available information sources.

4.4.1 Definition of financial impact features and score per country

It should be noted that proper resource planning and access to innovative funding mechanisms is critical for e-Government sustainability.

The criteria to be assessed in a tabular format are the following:

- Public procurement/e-Notification financing [20%]: Identifies the financial resources allocated to the public procurement field as a whole and in particular to e-Notification (e.g. purchasing and maintenance of hardware/software; training).). The level of financing in the area of public procurement /e-Notification has been graded based on the estimated costs (Minimal - 1, Reasonable - 3 and Significant – 5)¹⁴ for the introduction and use of electronic procurement notices.
- ICT expenditure [20%]: Indicates the priority/importance given to ICT improvement and training of public servants by the Government in the investigated countries. The level of ICT expenditure has been graded based on Eurostat statistics for the year 2004 (Low - 1, Low/Medium - 2, Medium - 3, Medium/High - 4, High - 5)¹⁵
- Expected results [20%]: Indicates the efficient utilisation of an e-Notification solution (covering the existence of a national e-Notification system or any other private e-Notification solution) and the potential savings in the medium and long term according to political willingness and planning (“before and after” implementation of e-Notification system assessment).
- Financial assistance [10%]: As the initial costs related to the implementation of e-Government can be considerable and Governments may have limited capacity to bridge the periods between initial investments and returns, financial assistance in the form of EU funds, cross-border cooperation, exchange of know-how etc may be essential. The level of financial assistance has been graded based on Eurostat statistics for the year 2004 (Low - 1, Low/Medium - 2, Medium - 3, Medium/High - 4, High - 5)¹⁶
- Publication fee to National Publication Outlet [10%]: Indicates the obligation for each contracting authority to pay a fee for the publication of procurement notices in the national dedicated Official Journal for all European tendering procedures (exceptionally the score ranges from Highest fee - 1 to Lowest fee - 5).

¹⁴ Minimal (less than 100 million €) - Reasonable (from 100 million € to 500 million €) - Significant (more than 500 million €)

¹⁵ Low (less than 5.9% of GDP) – Medium (from 6% to 6.9% of GDP) – High (more than 7% of GDP) – Source: Eurostat 2004

¹⁶ Low (less than 0.57% of GDP) – Medium (from 0.58% to 0.9% of GDP) – High (more than 1% of GDP) – Source: Eurostat 2004

- Publication fee to e-Notification system [20%]: Indicates the obligation for each contracting authority to pay a fee for the use of the supported tools and services, as well as, for the publication of procurement notices on the e-Notification system (exceptionally the score ranges from Highest fee - 1 to Lowest fee - 5).

The calculation of the financial impact score is based on the results achieved under each criterion, where each criterion has a different weighting factor depicted according to their importance in the overall picture of the financial impact in each of the investigated countries independently.

The formula for the calculation of the financial impact for each investigated country independently is:

$$\text{Country } X = (C1_score * C1_weight) + (C2_score * C2_weight) + (C3_score * C3_weight) + (C4_score * C4_weight) + (C5_score * C5_weight) + (C6_score * C6_weight)$$

The score for each one of the 6 indicators (C1, C2, C3 and C4) ranges from 0 (lowest) to 5 (highest), picturing the financial impact in each country. The weight for each one of the 6 indicators ranges from 0% (lowest) to 100% (highest).

The addition of all scores amount to the final financial impact score for each country investigated, hence serving comparison purposes.

Countries	Public Procurement/e-Notification Financing	ICT Expenditure	Financial Assistance	Expected Results	Publication Fee to National Publication Outlet	Publication Fee to e-Notification System	Financial Impact Score (Total)
Austria	5	3	3	5	2	4	3,9
Belgium	3	3	3	3	2	4	3,1
Cyprus	2	2	4	1	2	4	2,4
Czech Republic	3	5	2	5	2	3	3,6
Denmark	3	3	3	3	4	4	3,3
Estonia	1	3	3	4	4	4	3,1
Finland	3	3	5	5	4	2	3,5
France	5	4	3	3	2	4	3,7
Germany	5	4	3	3	2	4	3,7
Greece	2	3	3	2	4	4	2,9
Hungary	2	3	3	3	2	2	2,5
Ireland	2	3	3	5	4	4	3,5
Italy	3	4	3	3	2	4	3,3
Latvia	2	3	3	3	2	4	2,9
Lithuania	2	2	3	3	4	4	2,9
Luxembourg	3	2	2	3	2	4	2,8
Malta	3	2	5	3	4	5	3,5
Netherlands	5	5	2	5	4	4	4,4
Poland	3	3	5	3	2	1	2,7
Portugal	5	3	5	3	4	5	4,1
Slovak Republic	2	2	3	2	2	5	2,7
Slovenia	2	3	3	2	4	5	3,1
Spain	3	4		3	2	5	3,2
Sweden	3	5	3	5	4	5	4,3
United Kingdom	5	5	3	5	4	5	4,7
Iceland	2	2	2	1	4	4	2,4
Liechtenstein	1	2	2	1	2	5	2,2
Norway	3	3	2	5	4	5	3,8
Bulgaria	3	3	2	3	3	3	2,9
Romania	1	2	4	3	2	1	2,0

Table 5: Financial impact assessment per country

In Table 5, the financial impact score is calculated on the basis of a multiple set of sub-indicators pointing out the costs of developing, implementing and maintaining an e-Notification solution, as well as, the expected benefits from such application. The investigated countries can be divided in three groups in respect to their financial impact assessment score:

- *Advanced countries (score of 4.0 and above)*: It involves countries such as the Netherlands, Portugal, Sweden, and the United Kingdom, which have established an investment strategy applicable throughout the different administrative levels, resulting in significant efficiency gains (e.g. productivity, efficiency etc.) in the area of public procurement.

- *Intermediate countries (score of 2.5 to 3.9)*: It involves countries such as Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Hungary, Latvia, Lithuania, Luxembourg, Malta, Poland, Slovak Republic, Slovenia, Spain, Norway and Bulgaria, which have established an investment framework (or have taken the decision not to invest until a solid solution is introduced by other Member States) for the development and maintenance of an e-Notification solution. However, substantial and tangible benefits have not been achieved yet.
- *Developing countries (score of 2.4 and below)*: It involves countries such as, Cyprus, Iceland, Liechtenstein, and Romania, which are currently formulating an investment framework to support future development, implementation and maintenance of an e-Notification system or other private e-Notification solution.

The financial investment in the area of public procurement (i.e. ICT expenditure, e-Notification system, etc.) for the development and improvement of the organisation and technological structure of each investigated country has not returned yet considerable gains in terms of productivity and cost savings. It has been identified that only a small number of countries have actually shown measurable growth benefits. The Nordic countries - Norway, Sweden, Finland, and Denmark – along with the United Kingdom have achieved high productivity rates due to their long term investment in the area of e-Procurement, whereas countries such as Germany, France, and Italy are facing difficulties due to minimum or no returns on their investment. The benefits that have been achieved so far in the “advanced countries” include enhanced efficiency and effectiveness resulting from a significant reduction of transaction costs and process time cycles, greater transparency and integrity in procurement proceedings, fewer human errors, improved job satisfaction and staff motivation, etc.

It is expected that thanks to the systematic collaboration and sharing of experiences among different countries, it should be possible for national Governments to develop cost benchmarks for e-Procurement systems thereby ensuring a rational and prudent use of the resources available.

4.4.2 Critical issues/ obstacles and opportunity-type elements

A detailed description of the critical issues / obstacles along with the opportunity-type elements corresponding to the financial impact of the introduction of e-Procurement in particular in all the investigated countries is described in the sections below.

4.4.2.1 Implementation and maintenance costs of national e-Procurement/e-Notification mechanism

The introduction of an e-Notification solution brings about significant costs of varying nature in the countries investigated. Major constraints to be overcome in the field of e-Procurement development in general include the lack of a procedural/organisational framework for e-Procurement and more commonly, the differences in information and communication technology systems and infrastructures, the ill-adapted skills of procurement staff and the limited budget provisions for e-Procurement. Furthermore the contracting authorities within the investigated countries are also seeking funding to improve their organisational and technical framework which will enable the implementation of future e-government initiatives.

Another major finding is that the contracting authorities' procurement activities currently do not have the benefit of central policy guidance overall despite the steady significant growth in their financial value over the years. Partly as a result of this policy, the harmonization of procurement policies, procedures, and practices across the contracting authorities is still to make decisive headway.

An important and active role played in the development of public procurement in Sweden and the United Kingdom is the existence of Central Purchasing Bodies (CPB). Also, in countries such as Denmark, France, Spain and Italy Central Purchasing/Procurement Bodies play an essential part in the organisation and execution of procurement processes.

The CPBs in the countries in question are responsible for the implementation of procurement policy, as well as for the proper/on budget and on time delivery of all the projects related to the development of public procurement and to the general efficiency of the Government sector. Furthermore, another significant factor in the rapid expansion of the public procurement sector is the management of the financial resources/assets allocated for modernisation purposes by the CPBs, which is the case for, *inter alia*, the United Kingdom, the Czech Republic, Italy and Romania. These results are amplified in the case where the CPB is also responsible for the implementation of Government priorities/current and future development plans for the modernization of procurement processes and creation of an efficient and cost-effective e-Procurement/e-Notification solution.

Furthermore, the increased purchasing power of a Central Procurement Body in a given country allows the supply base to be streamlined and overhead costs to be reduced. It allows as well the proactive purchaser to seek changes in the supplier's organisation and production methods, further reducing costs.

Therefore, there still is room for improvement in the harmonization of practices, application of electronic solutions, and development of professional expertise of public servants. In this context, increasing emphasis should be placed on training in electronic procurement (e-Procurement/e-Notification) methods and on technical assistance in support of capacity-building for public procurement authorities.

While these endeavours have significantly improved procurement operations in the Nordic countries, the reforms were mostly confined to the improvement of operational efficiency (e.g. reduction of mistakes) and the cutback of operational costs.

4.4.2.2 ICT expenditure

Almost all the investigated countries maintain (since 2002) specific investment plans for the development of ICT infrastructure, which is one the core elements for the deployment and wide use of electronic public procurement. According to Eurostat findings, the investigated countries spent in 2004 an average of 3.0% of their GDP on IT and 3.4 % on telecommunications to develop their ICT infrastructure. The countries with the highest ICT expenditure as a percentage of their GDP in 2004 were Sweden (8.7% of GDP - approx. 10,7 billion €), Estonia (8.6% of GDP - approx. 203 million €), Bulgaria (8.6% of GDP - approx 320 million €), the United Kingdom (7.9% of GDP - approx. 60 billion €) and Latvia (7.6% of GDP - approx. 207 million €). Additional funds are also allocated for improving the educational system and training of public servants.

Leading countries in the e-Government readiness field such as Denmark, Sweden, the Netherlands and the United Kingdom continue their ICT investment by working on the progression (e.g. improving capacity, efficiency etc.) of their existing infrastructure, whereas Estonia, Romania, and Latvia are currently focusing on the establishment of basic ICT infrastructure. In the case of Bulgaria, ICT investment focuses mainly on the modernization of the present outdated infrastructure.

4.4.2.3 Results expected in short-medium term of e-Notification system implementation

Although the theoretical benefits of e-Procurement and especially of the introduction of e-Notification in any given country are undeniable, European countries however face to a varying degree challenges of a different nature. Specifically, countries such as Iceland and Lichtenstein, which are still at the starting line in the implementation of e-Procurement and of an e-Notification solution at national level, may foresee a negligible or even a negative financial outcome. The reasons for such pessimistic results may be the significant level of ill-adapted procurement personnel in terms of know-how and general knowledge on the use of new technologies rendering thus the functioning of e-Notification very difficult and the personnel prone to errors. Also, the maintenance and upgrading of the e-Notification solution may project a negative result regarding expenses incurred in comparison to the estimated benefits in terms of efficiency and productivity of independent contracting authorities. Furthermore, the implementation and maintenance activities may produce in certain countries, such as Belgium and Estonia additional delays than expected essentially due to technical, legal, or/and organisational setbacks.

The financial savings that can be obtained by implementing national e-Notification systems are associated to two ways of cutting back costs.

The first concerns the reduction on purchasing prices due to the extended competition expected when an electronic notification system is used since the adoption of such means gives public contractors the ability to disseminate invitations to tender to a significantly larger supplier base on time. In parallel, contracting authorities are granted better control of the purchasing process when using electronic tools.

The second way relates to the reduction of operational costs resulting from the simplification of the respective administrative work. Implementation of e-Notification solutions (Denmark, Finland, Norway, Sweden and United Kingdom) has proved that non-negligible amounts of resources and time can be saved when electronically by-passing the bureaucracy of dealing with conventional paperwork required for preparing and publishing public procurement contract notices.

Although there are some challenges (large number of externalities impacting on, or being impacted by, public spending and investments) when calculating the return on investment of e-Government projects¹⁷, there exists some adequately reliable estimation of the benefit when implementing e-Procurement solutions in several European countries and the EU as a whole by which the return on investment resulting from the implementation solely of e-Notification systems can be extracted. In particular, a report¹⁸ mentions that the estimated annual savings on purchasing prices in EU15 equals 18.75 billion € taking into account the following facts and assumptions:

- the value of annual public procurement in EU15 is 1.500 billion €
- 25% of public procurement contracts are realised through e-Procurement (i.e. 375 billion €)
- savings on purchasing price through e-Procurement is 5%

The respective financial savings on operational costs are estimated to be 8.3 million € per annum when accepting the following facts and assumptions:

- total annual number of public procurement transactions in EU15: 665.000
- 25% of transactions being realised electronically = 166.000 transactions
- savings per invitation to tender for buyers (estimation): 8%-35%
- conservative saving estimation per transaction: 50 €

The sum of the savings equals 18.83 billion € per year. This figure leaves a significant margin for a high return on the required investment for e-Procurement systems around Europe including development, maintenance and training.

As regards the savings resulting from the technical infrastructure of e-Notification systems, the existence of a single platform based on open source software (i.e. Estonia, Germany, Finland, etc.) can further reduce the licence, implementation, and maintenance costs. Open source software liberates public administrations from the dependency on a single vendor, presents lower hardware requirements, renders investments for future upgrades of the system less expensive while in parallel has the advantage of better supporting interoperability issues and international cooperation between administrations.

In addition, a well designed user-friendly system significantly reduces the cost and time required to prepare and submit notices for publication. Investments on flexible graphical user interfaces (i.e. Finland, Ireland, the Netherlands, Romania, and Norway) have proven to have a significant impact on the efficiency and rate of adoption of e-Notification solutions as working on them becomes more appealing and less time consuming.

¹⁷ <http://ec.europa.eu/idabc/en/document/1488/364>

¹⁸ www.funglode.org/v-mundial-di/documentos/eprocurementeuropa.ppt

4.4.2.4 Innovative funding mechanism and financial assistance for development of e-Procurement

The need to increase budget allocations for training, pool resources beyond contributions in kind, and to continue efforts to mobilize extra-budgetary income from all appropriate sources is shared by all the countries investigated to a varying degree. Concretely, limited financial assistance may come in the form of limited national/local Government budget, EU funds, restricted bilateral relations with other countries sharing assistance and know-how, and general private/public donations for the modernisation of the public procurement field.

The liberalisation/deregulation of the telecommunication industry has played an important role in the development and advancement of the ICT infrastructure due to private initiatives and investment capital from local and foreign companies. It has been observed that countries (e.g. United Kingdom, Sweden, Norway, the Netherlands) with a high degree of decentralised administrative structure and self-governing rights, extensive liberalisation in the ICT area and ICT literate workforce have easily attracted significant investment.

Specifically, a self-funding model has been adopted mainly by Sweden and the United Kingdom. Private companies (OJS e-Senders) offer basic e-Notification services to their clients free of charge for the drafting, publication, and advertisement of procurement notices, covering both above and below threshold contracts. Contracting authorities are expected to pay only for making use of added value services such as training, help desk, and publication of notices on the website (buyer profile) of the solution provider.

Furthermore, countries such as Belgium, Estonia, France, Greece, Germany, Norway, and Slovenia, have used the eTEN programme for funding/supplementing their national e-Government initiatives for the deployment of electronic services in the area of telecommunications thus serving public interest. In addition, countries such as Bulgaria, France and Norway have participated in the FP6 programme in order to receive EU financial assistance in the area of collaboration among public administrations, education of civil servants, document management, decision support, workflow, and policy making.

4.4.2.5 Expenses for the publication of notices to Publication Outlets

Publication of procurement notices in dedicated Official Journals by contracting authorities in the investigated countries may be free of charge or associated to a certain fee. Also, publication in an electronic format may be obligatory or only optional. Such requirements are entirely dependent on the national legislation and procedures in place in each country independently, rendering the process more or less regulated and strict. Therefore, publication of notices in countries such as Greece, or Lithuania, is free, whereas in the Czech Republic (approximately 40 €) or in France, a fee must be paid. Additional fees may be mandatory for the publication of notices on the national e-Notification system in countries where such a system is in place. In the Czech Republic for example, the advertisement of a procurement notice on the system amounts to approximately 15 €(cheaper than paper publication).

The procurement mechanism in countries where double publication of notices is mandatory, involves further activities and constraints than in those which require only a single OJEU publication. Countries such as Belgium Estonia, Finland, Germany, Ireland, Lithuania, the Netherlands, Romania, and Norway are waiving the fees for the publication of notices to the National Publication Outlet, in order to encourage contracting authorities to use their national e-Notification solution. Contracting authorities benefit from additional cost reductions that arise from the elimination of errors (additional validation offered by the e-Notification system) and the significant decrease of the administrative costs involved in the follow up activities.

Furthermore, countries such as Greece, Lithuania, Malta, Portugal, Slovakia, Iceland, Lichtenstein and Bulgaria have eliminated the fees from their National Publication Outlets in order to remove any supplementary financial obstacles.

Belgium, the Czech Republic, Denmark, France, Germany, Ireland, Italy, Latvia, Lithuania, Luxemburg, Spain, Lichtenstein, Norway, Bulgaria and Romania offer the use of their public e-Notification system to the contracting authorities free of charge.

In particular, Austria has developed its own in-house desktop Linux distribution (Wienux). Vienna plans to adopt open source software (Wienux and OpenOffice) on about 18.000 computers by 2008. This will assist on reducing significantly the overall software (i.e. licence fees for Microsoft products) and hardware (i.e. less power) investment. The adoption of a flexible and open IT environment based on open source software and open standards may improve the process by reducing the cost of services.

4.5 Level of cooperation/Interaction

The choice to follow a centralised or decentralised procurement system, to use Central Procurement or Purchasing Bodies is left to the discretion of each of the countries investigated. The EU Procurement Directives are silent on this matter. It is regarded as an issue of subsidiarity, one of national decision-making as regards the form of administrative arrangements established in a country provided that country meets its Treaty obligations on the openness and transparency of the procurement process, and the promotion of competition within the Community. However, in practice, many European countries already mix elements of centralisation and decentralisation in their procurement systems.

There are a number of possible strategies available to public contracting authorities in the EU Member States, EEA and Acceding countries concerning cooperation in the procurement field. The choice of strategy depends on the culture and circumstances of the country concerned, including the level of economic and market development. The centralisation vs. decentralisation debate is not a simple issue of black vs. white. A system that mixes elements of decentralisation and centralisation is likely to work well in many countries. In this same context, adaptation over the long-term to the requirements of e-Commerce also needs to be considered when assessing the level and nature of cooperation between contracting authorities in a given country.

4.5.1 Definition of cooperation/interaction features and score per country

The criteria to be assessed in a tabular format are the following:

- Decentralisation level [15%]: Indicates the structure and hence the level of decentralization/centralization on which the procurement mechanism is based at a national/regional level in the investigated countries.
- Central Purchasing/Procurement Bodies [25%]: Indicates the existence of any purchasing or general procurement body at national or regional level in the investigated countries.
- OJS e-Senders [25%]: Indicates both the existence and extensive usage of OJS e-Senders by contracting authorities (level of awareness) either in the public or private sphere.
- Effectiveness of use of Central Procurement Bodies [20%]: Contracting authorities procuring via these Central Procurement Bodies either obligatorily or on a voluntary basis at a national or regional level in the investigated countries.
- Political willingness versus policy results [15%]: Provides insight on the current and future initiatives undertaken either in the context of a centralized or decentralized procurement system.

The calculation of the level of cooperation/Interaction score is based on the results achieved under each criterion, where each criterion has a different weighting factor depicted according to their importance in the overall picture of the level of cooperation/interaction in each of the investigated countries independently.

The formula for the calculation of the level of cooperation/interaction for each investigated country independently is:

$$\text{Country } X = (C1_score * C1_weight) + (C2_score * C2_weight) + (C3_score * C3_weight) + (C4_score * C4_weight) + (C5_score * C5_weight)$$

The score for each one of the five indicators (C1, C2, C3, C4 and C5) ranges from 0 (lowest) to 5 (highest), picturing the level of cooperation/interaction in each country. The weight for each one of the five indicators ranges from 0% (lowest) to 100% (highest).

The addition of all scores amount to the final level of cooperation/interaction score for each country investigated, hence serving comparison purposes.

Countries	Decentralization Level	Central Purchasing /Procurement Bodies	OJS e-Senders	Effectiveness of Use of CPBs	Political Willingness versus Policy Results	Cooperation/Interaction Score (Total)
Austria	5	3	4	2	2	3,2
Belgium	3	3	4	1	4	3,0
Cyprus	4	3	0	4	3	2,6
Czech Republic	3	4	5	4	4	4,1
Denmark	5	3	5	1	2	3,3
Estonia	1	3	2	3	2	2,3
Finland	1	4	4	3	4	3,4
France	3	3	5	2	4	3,5
Germany	1	4	4	3	4	3,4
Greece	5	3	1	2	4	2,8
Hungary	3	4	4	4	4	3,9
Ireland	1	3	4	3	3	3,0
Italy	3	4	4	3	3	3,5
Latvia	3	3	2	4	4	3,1
Lithuania	1	3	4	4	4	3,3
Luxembourg	3	5	4	4	3	4,0
Malta	3	3	0	4	3	2,5
Netherlands	1	2	5	2	5	3,1
Poland	3	3	1	4	1	2,4
Portugal	5	3	1	2	5	2,9
Slovak Republic	5	3	1	2	4	2,8
Slovenia	5	2	1	1	1	1,9
Spain	3	3	1	2	4	2,5
Sweden	5	4	4	2	3	3,6
United Kingdom	5	3	4	4	3	3,8
Iceland	5	3	0	2	4	2,5
Liechtenstein	5	3	0	4	1	2,5
Norway	1	3	4	4	5	3,5
Bulgaria	3	2	2	1	2	2,0
Romania	1	4	2	4	4	3,1

Table 6: Level of cooperation/interaction assessment per country

In Table 6, a ranking has been assigned to the 30 investigated countries in terms of their cooperation/interaction features. The overall score of each country is based on their position according to the criteria described above with an exception related to the first one. The fact that a country operates under a centralised model, a decentralised model or a hybrid model (semi-centralised) does not take part in the final score, since as already mentioned this is not an issue of black vs. white.

Thus, the investigated countries can be divided in three groups in respect to their cooperation/interaction features:

- Advanced countries (score of 4.0 and above): It involves countries such as the Czech Republic and Luxembourg, which have established Central Purchasing/Procurement Bodies; which are also using OJS e-Senders for contract notifications; which present an effective use of the existing Central Procurement/Purchasing Bodies and in addition, show strong political willingness towards enhancing general interoperability between interested parties.
- Intermediate countries (score of 2.5 to 3.9): This group comprises countries such as Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Portugal, the Slovak Republic, Sweden, United Kingdom, Iceland, Liechtenstein, Spain, Norway and Romania which have established Central Purchasing/Procurement Bodies; have the ability to use OJS e-Senders for contract notifications to the OJEU, but have an overall less effective system and are not adequately politically active in order to present the respective results in terms of interoperability.
- Developing countries (score of 2.4 and below): In this last group of countries, belong Estonia, Poland, Slovenia, and Bulgaria, the majority of which lack a Central Procurement/Purchasing Body or OJS e-Senders and in addition show a weaker political willingness in terms of initiatives undertaken for enhancing interoperability.

The establishment of a Central Purchasing/Procurement Body is considered a positive step towards the achievement of a satisfying level of cooperation/interaction in the public procurement field. Another feature that leverages cooperation/interaction is the existence of OJS e-Senders (developed and provided either by public or private organisations) and the opportunity for contracting authorities to use them extensively and efficiently at national level. The total score of each country is also dependent on the effectiveness of the use of existing Central Purchasing/Procurement Bodies. Additionally, in order to achieve the expected results, adequate political willingness and initiatives must be present. This is reflected on the uptake of current and future action plans and programmes. Finally, it must be noted that there is no classification of countries according to the model (fully centralised, semi-centralised, fully decentralised) they operate under, since research has shown that efficient e-Notification solutions exist independently of this structural choice.

4.5.2 Critical issues/ obstacles and opportunity-type elements

A detailed description of the critical issues/ obstacles and opportunity-type elements depicted by the level of cooperation and interaction between contracting authorities is described in the sections below.

4.5.2.1 Decentralisation/Centralisation level

4.5.2.1.1 Decentralisation

The decentralised approach to public procurement is very often opted and is widely accepted as the preferred solution to public purchasing policy across European countries. As such within a decentralised system, in any given European country, independent contracting authorities in accordance to their national legislation are responsible for conducting procurement activities according to their own personal needs. This approach however in its genuine form, may sometimes create in certain countries, a lack of regulation altogether of public procurement, described via a lack of standardised procurement policy across the State and local Government. Although promoting the activities of SMEs especially, a totally decentralised system may beget quite heterogeneous and fragmented sources of knowledge and thus in some cases, increase the cost of development and maintenance of the procurement system due to the implementation of multiple technical/functional applications. Furthermore, such a system may even result in a significant lack of monitoring of the compliance of procurement transactions with the law and question whether the transactions of contracting authorities deliver value for money. Hence, proper enforcement of procurement regulations in such a decentralised model in which the centre may have insufficient information may be a serious problem and challenge for a country. A decentralised procurement system has a different impact on the functioning of public procurement in each country directly dependent on the level of economic growth, administrative decentralisation and general transparency in the activities of independent contracting authorities. A characteristic example is Belgium where the Federal Government (JEPP) and the Walloon region (IAM/PAM) are developing similar competitive services for the preparation, validation and drafting of procurement notices.

However the decentralised approach, in contrast with the centralised one whereby one Government organisation representing the collective needs of Ministries and other state bodies carries out procurement functions, also entails a number of benefits. The rationale for relying on a decentralised approach is generally that by placing the procurement function closer to the needs of the final user, it is likely to be more economically efficient and better able to promote the development of the private sector, including small and medium-sized enterprises (SMEs). It can be observed that in many of the investigated countries, apart from the bodies responsible for the actual purchasing, additional Central Procurement Bodies have been established with the main tasks of setting national policy, organising training activities, drafting the legislation etc. The establishment of such bodies represents a great change from earlier central monopoly purchasing systems. The purchasing function itself has been decentralised to hundreds or sometimes thousands of procuring contracting authorities.

While applying a decentralised procurement model, the investigated countries concerned, to a varying degree, present many specific advantages. Firstly, such a decentralised system matches more accurately the goods and services delivered with the detailed requirements set by end users. On the same basis, one can observe a reduced scope for mistakes affecting large volume purchases which in turn result in unnecessary over-spending. Another key advantage may be the reduction of bureaucracy thanks to the shorter time frames set and fewer forms for both purchasers and suppliers in public contracts. In some cases, further advantages are observed which have a direct impact on transparency, through the reduction of corruption due to reduced incentives (e.g. favouritism; large-scale protectionism) and competition through the presentation of greater development possibilities for SMEs. These advantages may altogether assist in a radical change of mentality and affect the social behaviour of a given society. Countries such as the United Kingdom, Finland, Denmark or Norway, are representative examples of the effectiveness of the decentralised procurement model.

4.5.2.1.2 Centralisation

Tendering activities in the investigated countries may follow a more or less centralised process. Public procurement policy is based on the national legislation in force in each of the subject countries concerned. All phases of public procurement and especially of notification may form the object of a common procedure where all contracting authorities in one given country follow a mandatory set of requirements for the submission of notices for publication both at European and national level. Apart from the mandatory requirements to be fulfilled by contracting authorities which as such may experience a lack of flexibility and independence in the conduct of their activities, increased centralisation policy in a country may additionally present other difficulties to the smooth processing of procurement processes. Specifically, in some countries, contracting authorities may experience a general lack of assistance and support by responsible procurement bodies in the conduct of the notification phase of procurement. In others, contracting authorities may additionally face potential delays in the e-Procurement machinery with a special focus on the submission of notices. Also, centralised procurement can sometimes lead to the purchase of unsuitable goods and services as the specific, detailed requirements of all end-users cannot be taken into account (difference between purchasers own needs and what can be delivered on a central basis). In other occasions as well, centralised procurement can be seen as encouraging corruption as it can involve large-scale protectionism or favouritism. In such cases, competition is not encouraged and lower prices are not obtained. Finally, there is a risk, within a given centralised system, that the needs of the user are not fully satisfied since such systems inevitably involve some rationalisation and homogenisation of demand. Countries such as Estonia and Bulgaria are representative of procurement systems where enhanced centralisation presents many difficulties of a varying nature and significance.

As a contrast however to the above, many arguments can be put forward by centralised procurement systems. The main advantage of centralised procurement lies in the potential economies of scale. Specifically, volume purchases make it possible to obtain significant reductions in the price of goods or to receive better services at lower costs. For that matter, a large producer for example should be able to achieve greater savings that can be passed on in the form of reduced prices if he has a single large contract with a centralised procurement body. Such centralised procurement body can further see its purchasing power increased. Countries such as Estonia or Lithuania are representative examples of cost efficient centralised procurement systems.

Other advantages for a given country include the establishment of technical standards for information technology systems and computer software applications within the government sector along with the addition of environmental standards to the contracts with suppliers. As a result, it is less easy to achieve these objectives if the Government purchasing system of a certain country such as Bulgaria is highly fragmented, in particular in the absence of a Central Procurement Body with adequate powers. In addition, potential non-cost benefits supporting centralised purchasing include better service to the customer resulting from a more expert and responsive staff. Hence, greater attention can be paid to contract management and problem resolution (e.g. after sales maintenance), more easily achieved in a more centralised system. Also, a centralised procurement system encourages better management of human resources as the training of staff can often be more easily undertaken because many staff members are usually centrally located. This in turn can lead to a reduction in training costs. Countries such as the Netherlands and Cyprus are good examples of centralisation where the training of the procurement personnel is taken upon by the Central Procurement Bodies, Piano and the Public Procurement Directorate respectively resulting in a significant reduction of expenses and increase in staff productivity. Finally, a common feature to all countries applying centralised purchasing systems is the encouragement and promotion of good transparency provisions such as proper recording and reporting of transactions, effective management controls and an audit trail open to public scrutiny. Ireland and Italy are both representative of the positive impact of centralised procurement regarding transparency issues. In this context, purchases can more easily be checked for evidence of financial mismanagement and corruption. As a result, sound financial practices are more easily maintained.

4.5.2.2 Existence of Central Purchasing/Procurement Bodies

The existence of central bodies in the field of public procurement is important in analysing the structure, interaction of the responsible procurement entities in each country as well as the nature of centralised services these bodies provide. Hence, a Central Purchasing Body is commonly defined as a contracting authority which acquires goods or services intended for one or more contracting authorities; awards public contracts intended for one or more contracting authorities; or concludes framework agreements for works, goods or services intended for one or more contracting authorities. Commonly Central Purchasing Bodies utilise information systems capable of handling the collection of purchasing requirements from one or more contracting authorities, drafting procurement notices and submitting them for publication to the National Official Journal and to the OJEU. Such systems are optimised for handling the establishment of framework agreements at a Federal and State level and therefore provide similar functionality and follow the same rules as any national e-Notification system. The existence of a Central Purchasing Body in a country requires additional effort for its development and maintenance. However, the existence of a Central Purchasing body in a country is estimated to reduce costs in the long run and increase efficiency. Consip in Italy, e-Vergabe in Germany or Hansel Ltd in Finland are illustrative of such centralised bodies for the efficient establishment of framework agreements for central Governments.

Furthermore, the existence of a Central Procurement Body in a country, acting on behalf of other contracting authorities in a centralised manner in the field of public procurement, has a significant role in the proper and efficient execution of the e-Notification procedures. Its main responsibility is to provide assistance to the contracting authorities during the preparation, internal validation and submission of procurement notices to the National Official Journal and the OJEU. Furthermore, it is accountable, for monitoring/reviewing procedures, for providing advice, for offering training to the procurement personnel of contracting authorities, for publishing notices, etc. In countries such as Romania or Estonia, where the submission of procurement notices to the national e-Notification system is mandatory, the Central Procurement Body is an integral part of the validation process followed for the submission of notices to the National Official Journal and to the OJEU.

The lack of a Central Procurement Body in countries such as Slovenia may affect the development and adoption of common standards. Therefore, there may be limited organizational interoperability since there are no national guidelines or assistance for the internal organization of the business processes required for the preparation, and validation of procurement notices.

Another important issue is the overall lack of technical interoperability between the different contracting authorities in the investigated countries. The cost of deploying a homogeneous hardware and software infrastructure is often too great, considering that system characteristics may change due to continuous technological advancements.

Although the “international” agency is very much the exception, some countries are extending the operations of their national procurement bodies beyond their own frontiers. This is true, for example, of Germany’s GTZ, the Netherlands’ NIC, and the UK’s Crown Agents and subsidiaries. All three organisations combine centralised purchasing with technical co-operation and the provision of services for their own Governments, other countries, or international organisations. These organisations also offer technical assistance in procurement to the private sector (e.g. price checks on imports, independent quality inspection prior to shipment).

Furthermore, contracting authorities in certain countries, benefit from adherence to the procurement proceedings which are undertaken by other contracting authorities in the same or other countries emphasizing on the importance of interoperability and improvement of networking among procurement services. In this context, compatibility of rules and platforms is seen to facilitate the sharing of procurement proceedings and outsourcing by enabling contracting authorities to procure on behalf of others.

4.5.2.3 Effectiveness of use of CPBs

Besides the existence of Central Procurement Bodies in the investigated countries, their effectiveness should also be examined. The effectiveness of a CPB is mainly reflected in its adoption and use rates. Regardless of the existence of an electronic procurement platform (discussed in detail in section 4.2), the most important contribution of a CPB is more fundamental, since it is closely associated to the structure of the relevant procedures. A CPB's role is to introduce transparent and secure procurement procedures using common standards that lead to the minimisation of corruption levels, the maximisation of the reliability of the procurement process, the minimisation of the required time and cost and last but not least to the development of a healthy procurement community having common vision and objectives. In addition, among a CPB's duties is to promote regulated procedures that are sound and efficient.

A good example of an effective CPB is that of OGC in the United Kingdom. OGC is an independent office of the Treasury and works with public sector organisations in order to gain the most from procurement. Among OGC's activities is to support initiatives that encourage better supplier relations, sustainable procurement, the benefits of utilising smaller suppliers and the potential of e-Procurement. In addition, they represent the UK to the EU and help the public sector interpret and implement EU procurement rules in the UK. Finally, they also support major programme and project management, which involves complex procurement.

Another good example is the CPB of Cyprus, a country where an e-Notification solution does not exist. The CPB is the Public Procurement Directorate (PPD) of the Treasury of the Republic of Cyprus. Although, the lack of an electronic notification system is considered a handicap and it is exclusively analysed in section 4.2, Cyprus' CPB is considered effective since it has successfully contributed to the evolution of public procedures so far. Although there is a long way for Cyprus in order to converge with the leading Member States in the area of e-Procurement, the rate of the progress being made is satisfying and it is mostly due to the efforts of the CPB in the areas of policy making in public procurement, implementation of these policies, implementation of technical aspects in public procurement.

4.5.2.4 OJS e-Senders

Approximately half of the investigated countries (Austria, Belgium, the Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxemburg, the Netherlands, Norway, Sweden, and the United Kingdom) use private or public entities (OJS e-Senders) for the electronic submission of their procurement notices. From the remaining 15 countries, the ones with an existing e-Notification system are currently in the process of becoming OJS e-Senders, whereas countries that are still in the establishment phase of their e-Notification systems, they have it as a high priority. Delays are experienced due to the extensive qualification procedures enforced by OPOCE for becoming an OJS e-Sender and produce valid XML file notices. To become an OJS e-Sender, the corresponding entity will have to pass through different phases for each type of notice that must be published electronically. This process is lengthy and time consuming and requires extensive resources for the collection and preparation of sample procurement notices to be used during the alpha (isolated test) beta (real-life test) and gamma phase (production).

OJS e-Senders are acting on behalf of contracting authorities for the creation, collection, and submission of procurement notices to the OJEU in a structured XML format have increased efficiency and shorten the time limits for the publication of notices.

In a nutshell, countries which use central bodies and OJS e-Senders for their procurement activities, in a mandatory or optional manner, usually have an advantageous position in the monitoring and coordination of activities among contracting authorities. Further advantages include cost reductions regarding the implementation of common applications and uniformity in quality and use of standards among contracting authorities.

4.5.2.5 Political willingness versus policy results

In the 30 investigated countries, the national governmental e-Procurement policy is more or less active. Such policy sets the pillars of the procurement mechanism in a country emphasizing on the varying advantages it offers. Firstly, an active governmental policy usually establishes a common organisational framework (structure and responsibilities of the involved parties) on which electronic public procurement is enforced either within the context of a centralised or decentralised system. Countries such as the United Kingdom, Denmark or France are good examples of the common strategies and policies introduced by their respective Governments for the organisation and functioning of e-Procurement. Initiatives have been streamlined at national level to encompass all local and State initiatives in one common national driving force. Other advantages introduced in one given country via an active governmental policy include the organisation of seminars and workshops for the support and guarantee of equal treatment and transparency principles in the field of e-Procurement. In the Netherlands and Estonia for instance, Piano and RIA respectively, are two independent institutions responsible for the promotion and development of e-Government and specifically of e-Procurement activities. Furthermore, countries such as Finland and Sweden have implemented active policies in the field of procurement by delivering efficient and effective e-Procurement and e-Notification services accessible from all contracting authorities and private entities altogether. Such governmental initiatives are indicative of the level of prioritization of public procurement in each country concerned.