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(eGEP)

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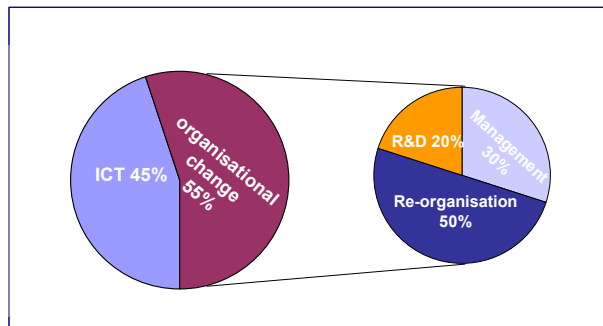
Author(s)	For RSO SPA Cristiano Codagnone, ccodagnone@rso.it Valentina Cilli, vcilli@rso.it Cso. Vittorio Emanuele II, 229; I-00186 Rome- Italy Tel: +39 06 681027013 Fax: +39 06 6877061
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Executive Summary

The topic of monitoring eGovernment costs has not received, to date, the same amount of attention as that of eGovernment impact and benefits. eGEP expenditure study contributes in filling this gap by stressing that the cost (input) side is as important as the impact side in a fully comprehensive measurement framework and by accordingly delivering two cost monitoring methodology proposals, complemented by an in-depth analysis of the intangible costs of organisational change and a corresponding 'rule of thumb'.

eGEP simplified proposal consists of a Cost Element Structure representing an advancement in terms of comprehensiveness and of better conceptual organisation with respect to the current state of play and integrated by a discussion of less tangible and hidden costs of organisational change. Finally, eGEP advances a simplified and intuitive micro-level 'rule of thumb' guideline for the main cost components and their break down to be considered over an average five year perspective (from planning to full blown services provision) for relatively large eGovernment projects.

eGEP 'Rule of thumb'



The expenditure study presents also the result of the quantitative assessment of ICT and eGovernment Expenditure by public administration

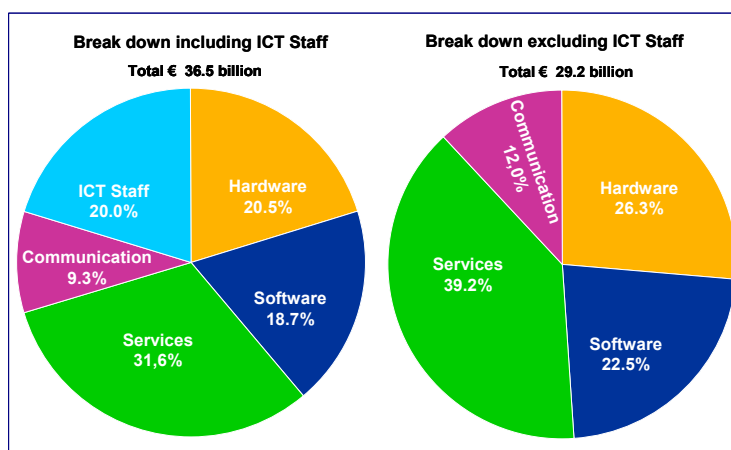
Total (including central, regional and local layers) public administration ICT expenditure in 2004 for EU25 is estimated at about € 36.5 billion, with the largest market being, in order, UK, Germany, France, Italy and Spain.

The EU15 subtotal is about € 34.9 billion, which, when compared to the EITO 2002 figure of € 29.3 billion amounts to a 19.1% growth rate between 2002 and 2004.

If measured in terms of per capita and/or as a % of GDP, ICT expenditure is highest in the Scandinavian/Nordic countries (Denmark, Finland and Sweden), with the UK catching up with this cluster, while a second group (France, Germany, Netherlands, Austria, Belgium) lags behind, and Italy and Spain even more so. The breakdown into

administrative layers shows that regional and local governments taken together amount to 55% of ICT expenditure with central government at 45%. The average breakdown of ICT expenditure into its components for EU25 shows that the aggregated technological elements still command the major share of expenditure.

EU25 ICT expenditure breakdown by components, 2004



Source: : Estimation from eGEP questionnaire data;

Total public administration eGovernment expenditure in 2004 for EU25 is estimated at about € 11.9 billion, with the largest market being again , in order, UK, Germany, France, but with the variation that Sweden spends more than Italy and Spain. The EU15 subtotal is about € 11.5 billion representing 33% of ICT expenditure that, compared to the EITO 2002 figure of € 6.6 billion (22% of ICT expenditure), seemingly comes across as a large increase. As a matter of fact, the two figures are not entirely comparable as eGEP estimate is based upon a wider definition of eGovernment than that used in EITO 2002 (mainly limited to the front end dimension). If measured in terms of per capita and/or as a % of GDP, also eGovernment expenditure is highest in the Scandinavian/Nordic countries (Denmark, Finland and Sweden), with the UK catching up with this cluster. Taking into consideration the breakdown of eGovernment expenditure by administrative layers, we can observe a general and noteworthy tendency: regional and local percentages cumulated are in general higher than in the case of the same break down for ICT expenditure. This confirms the growing relevance of the regional and local dimension in the delivery of online public services. Finally it is estimated that the intangible cost of organisational change for eGovernment in 2004 could be up to € 4 billion, and thus would lead to a total figure of € 16 billion for EU25..

Cristiano Codagnone
 Consortium Project Manager

1. Introduction

This draft final report presents the main findings of the work carried out for the elaboration of The Expenditure Study, which identifies and analyses the costs of setting-up, providing and maintaining eGovernment services and assesses ICT and eGovernment Expenditure and corresponding financing mechanisms. Such work has delivered four basic outputs:

1. A state of play review of existing eGovernment cost monitoring methodologies;
2. A methodology to monitor the costs of setting up, providing and maintaining eGovernment services;
3. A qualitative assessment of the sources of funding for eGovernment in EU countries with recommendations on eGovernment financing strategies;
4. A quantitative assessment of public administration ICT and eGovernment expenditure in the 25 EU Member States;

This report presents very synthetically the main findings and proposals deriving from the work carried out, whereas the more detailed and technical discussions and illustrations of the supporting empirical evidence and methodological choices can be found in the accompanying Expenditure Study Compendium.

1.1. eGovernment Costs: the other side of the equation

The introduction of eGEP Measurement Framework Report shows how in the past few years (at least since 2003) the topic of measuring eGovernment impacts has gained policy momentum resulting in an increasing number of studies and methodologies.

As a result of our work on the state of play in the field of monitoring eGovernment costs, we can conclude that (at least in most of the EU Member States) this topic has not received an equal amount of attention.

It is our view, however, that the 'cost side' of eGovernment (the Input) is just as important as the impact. Costs are actually the other side of the 'equation' in a full-blown and comprehensive measurement and assessment of eGovernment. Costs must be taken into account to determine the net benefits yielded by the provision of eGovernment services. There are a number of reinforcing arguments underscoring the importance of having a thorough and steady control over the full costs of eGovernment services.

First, having measurable baselines for operational costs is fundamental in justifying investments and especially in engaging in innovative gain-sharing funding models with private-sector partners established on the basis of the projected savings that an eGovernment application is expected to yield.

Second, at the micro-level of single services, a full analysis and calculation of the costs incurred to set up and especially to operate an eGovernment service is one of the building blocks in determining its internal impact in terms of efficiency. Indeed the quantification of efficiency impacts presupposes a differential analysis between the cost of providing the same service traditionally and digitally.

Third, a thorough understanding of its full costs is an important managerial instrument for controlling that eGovernment projects are not drifting away from their planned direction and producing unintended outcomes¹.

Fourth, besides being an instrument for internal management control, the monitoring of resources used for eGovernment is also important in terms of accountability and transparency of how public financial resources are spent.

Fifth, knowing how much is spent on eGovernment in each Member State and in the EU as a whole can be a useful benchmark, not intended for 'naming and shaming', but rather as an indicator for assessing the level of investment. The average EU eGovernment expenditure, for instance, is a useful term of comparison for Member States in assessing whether their level of expenditure (taking into account proportionality and other parameters reflecting national specificities) is in line with such averages and, especially, if it can be considered productive given the number of services available online, their level of sophistication, and their documented impacts.

1.2. Cost Monitoring Challenges and the State of Play

There is no doubt that monitoring the full costs of eGovernment (including the intangible dimension) is a formidable challenge, and this can be understood by a brief comparison with the experience of the private sector.

If we look with a bit of historical perspective to the experience of the private sector we discover that until the mid 1990s, the record on measuring and controlling ICT investments has not been impressive. A survey of private organisations conducted in the early 1990s found, for instance, that only 18% of the respondents in the sample

¹ As it has been very aptly illustrated in the seminal work by scholar of information systems, Richard Heeks, when the "idolise" approach to the possible effects of introducing ICT in their agency prevails among public officials, there is the potential risk that the public sector becomes swamped in IT-driven projects, some of which have proved to be failures (Heeks, R. (ed.), *Reinventing Government in the Information Age: IT Enabled Public Sector Reform*, (Routledge, London 1999), pp. 22-48). The issue of IT projects failure and/or of their unintended outcomes is not peculiar to the public sector, it is actually a phenomenon analysed in the private sector and defined by Ciborra as 'technological drift'. The lack of appreciation of the organisational complexities (a dimension clearly related also to the full costs of a project) of ICT projects may cause such projects to shift from the planned role and functions and drift towards uncertain directions (Ciborra, C., *The Labyrinths of Information: Challenging the Wisdom of Systems*, Oxford: Oxford University Press, 2002).

applied rigorous methods to monitor the costs and benefits of IT investments². Another more recent study concluded that the costs of IT projects are significantly underestimated³. An analysis of UK experiences dating back to the first half of the 1990s shows that at least 22% of expenditure on IT is wasted and between 34 and 40% of IT projects realize no net benefits, however measured⁴. While in principles costs should be more easily measured than benefits, it has been pointed out how substantial parts of the costs of an ICT investment are intangible or hidden and are usually missed out in the evaluation of ICT investments: up to 40% of relevant costs incurred on ICT can be outside traditional ICT budget estimates⁵. A 1990 survey of ICT managers found that up to 65% of them thought that they were probably failing to identify full cost through the formal evaluation process⁶. Traditional examples of intangible or hidden costs cited in the business literature are training costs and costs deriving from a temporary fall of productivity due to the switch from the well-known old system to a new one. As seen in the increasingly competitive climate of the private sector, the requirement for strong cost control and high returns of ICT investments has already become a strategic issue since the early 1990s, making the evaluation, justification and control of ICT investments a critically important issue⁷.

From a statistical perspective, the full quantification of IT expenditure in the private sector is also problematic, although efforts to gather this data by national statistics offices have started much earlier than for the public sector. These difficulties are clearly explained in a paper by staff members of the Swedish National Statistics Office⁸ and include: a) the lack of robust operational definition delimiting what must be considered IT expenditure in a clear-cut way; b) the fact that different

² Hochstrasser B, and Griffiths C., *Controlling IT investment: strategy and management*, Kobler unit, Chapman & Hall, 1991.

³ Fitzgerald G., "Evaluating information systems projects: a multidimensional approach", in *Journal of Information Technology* 14 (1998), pp. 17–30.

⁴ Willcocks L. and Lester S., "Evaluating the feasibility of information systems investments: recent UK evidence and new approaches", in Willcocks L. (ed.) *Information management: the evaluation of information systems investments* (Chapman & Hall, 1994).

⁵ Clemons E. and Weber B., "Strategic information technology investments: guidelines for decision making" in *Journal of Management Information Systems*;7(2) (1990), pp. 10–31; Willcocks L. (ed.) *Information management: the evaluation of information systems investments* (Chapman & Hall, 1994).

⁶ Strassmann P., *The business value of computers*, (New Canaan: The Information Economics Press, 1990).

⁷ See for instance: a) Hochstrasser B, and Griffiths C., *Controlling IT investment: strategy and management*, (Kobler unit, Chapman & Hall, 1991); b) Bacon J. "Why companies invest in information technology", in Willcocks L. (ed.) *Information management: the evaluation of information systems investments* (Chapman & Hall, 1994); c) Willcocks L. and Lester S., "The evaluation and management of information systems investments: from feasibility to routine operations", Willcocks L. (ed.) *Investing in information systems: evaluation and management*, (Chapman & Hall, 1996).

⁸ See Hintze A. and Andersson K., (September 2001), *The dilemma of quantifying IT expenditures in organisations*, Sweden Statistics, Voorburg Group on Services Statistics, available from <http://www.voorburg.scb.se/Paper%20Voorburg%2020010821.pdf>, accessed May 2005.

organisations use different accounting practices and include different items under IT expenditure, thus rendering comparisons very difficult.

The pressure for cost control is now also up for large ICT projects in the public sector, though the experience in such monitoring is much shorter and thus the work is only at an early stage.

The European landscape in terms of eGovernment cost monitoring methodologies shows that there are still few detailed cost monitoring methodologies. Such methodologies, basically amount to the conceptual organisation of cost elements into a logical structure, implicitly or explicitly following a Total Cost of Ownership approach adapted to eGovernment. The issue of less tangible costs (reorganisation, training, management of change), intended in the broadest sense and not simply measured by proxy indicators⁹, is very seldom and often only cursorily touched. Some of these items are certainly listed in the identified cost element structures but little analysis and elaboration on the topic is provided. In general, also from the case studies, it emerges that among practitioners, apart from the difficulties, there is still a lack of awareness and/or willingness to consider such elements¹⁰.

The picture in this respect is a bit more advanced in countries such as the US¹¹ and Australia. In the US, a number of subsequent legislative and regulative acts including the well known OBM Circular A-76¹² and, in Australia, the activity of the Australian National Audit Office (ANOVA)¹³ have created strong incentives for public agencies to adopt more sophisticated cost monitoring techniques also in the domain of eGovernment.

⁹ For instance a proxy measure of the cost of re-organisation can be represented by the amount spent on management consulting services for re-organisation, a full measure, however would have to include other items (workdays of internal personnel, decrease of productivity, etc) as will be illustrated in par 2.3.2

¹⁰ In the work on the case study on the Italian Tax Agency, for instance, screening the large amount of administrative records and documentation obtained, we were able to identify costs that we consider as "change management" and that were not even mentioned in the course of conducted in-depth interviews.

¹¹ Insights into the topic, the costs of "organisational readiness" and how "users adaptation to the new systems" have been gained, for instance, can be found in a report of the Center for Technology in Government of the State University at Albany as early as 1997 (see Bloniarz, P.A., and, Larsen, K.R., *A Cost/Performance Model for Assessing WWW Service Investments*, Centre for Technology in Government, University at Albany/SUNY, 1997 available from <http://www.ctg.albany.edu/publications/guides/costpermodel/costpermodel.pdf> , accessed May 2005).

¹² Executive Office Of The President Office Of Management And Budget Washington, DC 20503 May 29, 2003 Circular No. A-76 (Revised) (<http://www.sba.gov/a76/circular.pdf> , accessed January 2006).

¹³ Australian National Audit Office (ANOVA), *Measuring the Efficiency and Effectiveness of E-Government*, Audit Report No.26 2004-05 (<http://www.anao.gov.au/WebSite.nsf/Publications/2C3CDF64278872A9CA256FA2007F445E>, accessed January 2006)

Returning to the EU landscape, and moving from micro level cost-monitoring methodologies to the macro level of quantification of general ICT and eGovernment specific expenditure by Public Administrations in the 25 EU Member States, the situation is quite challenging and presents a number of problems.

In the course of the extensive and prolonged desk research on publicly available sources¹⁴ the only data on ICT and eGovernment expenditure that were found are those reported in the European Commission Communication on the role of eGovernment for Europe's future¹⁵. The following editions of EITO (2003, 2004, and 2005) no longer address the topic of public administration ICT and eGovernment expenditure, and present ICT expenditure data for the economic system as a whole. This same data can be downloaded on the Eurostat website on information society statistics, where no specific data on public administration expenditure is available. The same applies for the various OECD statistics. Given the number of problems concerning conceptual¹⁶ and institutional¹⁷ issues, and given that most public agencies in the 25 EU Member States do not monitor their ICT and eGovernment Expenditure thoroughly, the aggregate quantitative assessment of ICT and eGovernment expenditure, and even more the breakdown of such expenditures in their components, has turned out to be a daunting task. Having said that, we need nonetheless to stress that we have coped with such challenges and present solid estimates of the relevant expenditures in Section 4. Moreover, in Section 5 we provide some concluding recommendations on how to improve the information based on eGovernment expenditures in the coming years.

1.3. eGEP Expenditure Study Objectives and Approach

As anticipated, in accordance with its initial objectives, this report delivers the following outputs:

1. A methodology to monitor the costs of setting up, providing and maintaining eGovernment services (Section 2)¹⁸;

¹⁴ Thus excluding the data produced and sold by global market research company specialised in ICT related work such as Gartner, IDC, Kable.

¹⁵ Communication From The Commission To The Council, The European Parliament, The European Economic And Social Committee And The Committee Of The Regions; *The Role of eGovernment for Europe's Future*, COM(2003) 567 final, September 2003.

¹⁶ For instance the lack of an operational definition of eGovernment expenditure as distinct from ICT expenditure and comparable across the 25 Member States.

¹⁷ For instance the low level of granularity in national accounting systems preventing them to fully capture the relevant expenditures and their components.

¹⁸ A Full review of existing methodologies and of the case studies developed are reported, together with a short guide on how to apply the Activity Based Costing methodology in the *Expenditure Study Compendium* (section 2).

2. A qualitative assessment of the sources of funding for eGovernment in EU countries with recommendations on eGovernment financing strategies (Section 3)¹⁹;
3. A quantitative assessment of public administration ICT and eGovernment expenditure in the 25 EU Member States (Section 4)²⁰

Instrumental to all three deliverables above, a very extensive desk research has identified and analysed existing studies and sources of information and was integrated with:

- In-depth empirical case studies;
- Interviews, conducted in the course of several field missions, to gain further insights into the understanding of costs directly from those people that are actually coordinating eGovernment national programmes and/or operating eGovernment services;
- Interviews with industry experts (i.e. Gartner, IDC, Kable) and with experts from international organisations (OECD and UNDESA).

In addition, for the purpose of delivering the quantitative assessment of expenditure we engaged in primary data construction through the distribution of a questionnaire on eGovernment Expenditure to national contacts within central departments/agencies with jurisdiction over eGovernment in each of the 25 EU Member States, as well as to about 200 regional and local relevant agencies appropriately selected in the 25 Member States²¹. This is a quintessential empirical descriptive work where we raise no claim as to the explanation of the different level of spending in the different countries, but which entails some quite sophisticated methodological work for the estimation of the data not obtained directly from the questionnaire returned by the Member States²².

¹⁹ A country profile describing the main financing mechanisms for each of the 25 Member States can be found methodology in the *Expenditure Study Compendium* (section 3).

²⁰ The background work supporting the expenditure assessment is illustrated in *Expenditure Study Compendium* (section 4). Moreover, country specific expenditure data are reported in Fact Sheet elaborated for each of the 25 Member States presented as section 5 of the *Expenditure Study Compendium*.

²¹ See *Expenditure Study Compendium* (par. 4.3 and 4.4).

²² See *Expenditure Study Compendium* (par. 4.1 and 4.2).

2. eGovernment Cost Monitoring Methodologies

2.1. Basic Cost Analysis Concepts and Methodologies

If we leave aside for a moment the eGovernment specificities, the focus of discussion here is on the concept of costs within large-scale organisations. On the general topic of conceptualising and assessing costs, a consolidated tradition of management and accounting studies exists, published in generalist journals such as the "Harvard Business Review" and in more specialized ones such as "The European Accounting Review", "Management Accounting Research", "Accounting, Organizations and Society". In the more specialised field of ICT substantial literature has been developing on the so-called Total Cost of Ownership (TCO) model, sometimes also referred to as Total Cost of Operations. Contributions on the topic abound in journals such as "Journal of Information Technology", "International Journal of Information Management", "Journal of Management Information Systems", etc., as well as in specialised online resources²³. It is beyond the scope of this report to review in detail such bodies of literature and to enter into detailed technical discussions on the various general cost methodologies. On the other hand, we deem it necessary and instrumental for the clarity of the analysis and proposals contained in this section to define some basic concepts and methodologies pertaining to the above-mentioned body of literature.

First, a basic and fundamental concept used in the cost accounting and management literature is that of **Cost objective(s)** defined as: *anything for which a separate measurement of costs is sought (a department, a service, a product, a project)*. Any analysis of costs must start by defining and delimiting clearly the cost objective for which the data will be gathered and organised.

Second, it is important to clarify that costs can either have a **direct** or **indirect** relationship to a particular **cost objective**. **Direct costs** are associated specifically and exclusively with a given cost objective. **Indirect costs** (overheads) cannot be associated specifically and exclusively with a given cost objective, but can (should) be imputed to more than one cost objective, using calculation based on allocation parameters²⁴.

²³ See for instance A review of TCO models and approaches at <http://h18000.www1.hp.com/tco/models.html> and at www.computerworld/printthis/1999/0,4814,42717,00.html.

²⁴ Concretely, the personnel costs directly incurred for the provision of service X is calculated by multiplying the number of hour worked per the relevant unit price, whereas the indirect cost of basic infrastructure is allocated to service X using a coefficient. Determining whether a cost is direct or indirect with respect to a given cost objective is not always straightforward. For instance, the salary of a supervisor for the data centre where the servers of a public agency are stored, including the one processing online transaction with end users, is a direct cost if the cost objective is the 'maintenance department', an indirect cost if the cost objective are the online transactions.

Third, the three basic categories of cost in traditional analysis are:

1. **Direct material costs**, costs for the acquisition of material physically identified as part of a given product;
2. **Direct Labour costs**, wages and salaries for all labour that can be traced to the manufacturing of a given product;
3. **Indirect costs**, all other costs, also referred to as 'overheads' (related to various value-chain activities, such as R&D, design, marketing, finance, HR, distribution, customer service, etc.).

Fourth, another traditional but increasingly outdated²⁵ conceptual distinction is that between:

- **Variable costs**, those that change in relation to the volume of output produced;
- **Fixed costs**, those that do not change in relation to the volume of output produced

The most traditional cost accounting methodologies are two:

1. **Direct Costing**: Direct and Indirect Variable Costs + Direct Fixed Costs;
2. **Full Costing**: Direct Variable Costs + Direct Fixed Costs + Pro-rata of Indirect Costs

These two and other traditional methods have been criticised in the seminal article of Cooper and Kaplan where they proposed the alternative "Activity Based Costing" approach²⁶, which we discuss in paragraph 2.4 and which has stimulated a burgeoning body of literature focusing on the advancement and refinement of cost monitoring techniques²⁷.

As anticipated, in the more specific field of ICT, a prominent methodology is that of the Total cost of ownership (TCO), defined by the online free encyclopaedia "Wikipedia" as follows:

... a type of calculation designed to help consumers and enterprise managers assess direct and indirect costs as well as benefits related to the purchase of computer software or hardware. A TCO ideally offers a final statement reflecting not only the cost of purchase but all aspects in the further use and maintenance of the computer components considered. This includes training support personnel and the users of the system. Therefore TCO is sometimes referred to Total Cost of Operation²⁸.

²⁵ This distinction is outdated due to the increasing dynamism and flexibility of the economic system and heavily depends on the time frame of analysis (i.e. in the medium term even a building can become a variable cost).

²⁶ Cooper, R., and Kaplan, R.S., "Measure costs right: Make the right decisions", in *Harvard Business Review* 65 (5) (1988), pp. 96-103.

²⁷ See the critical appraisal of ABC literature development in Bjørnenak, T., and Mitchell, F., "The development of activity-based costing journal literature, 1987-2000", in *The European Accounting Review* 11(3) (2002), pp. 481-508

²⁸ Reported in Consortium for studying, evaluating, and supporting the introduction of Open Source software and Open Data Standards in the Public Administration (COSPA), *Cost Benefits Analysis*, Unpublished research report obtained by eGEP as courtesy of the COSPA Consortium.

The categories included in a TCO cost-element structure is not uniquely identified and it is heavily dependent on the peculiarities of the project considered. In general the more recurrent categories (causes) of costs are:

- ❑ Software acquisition
- ❑ Hardware acquisition
- ❑ Maintenance
- ❑ Training
- ❑ Support.

2.2. The First Stage: eGEP an eGovernment Cost Element Structure

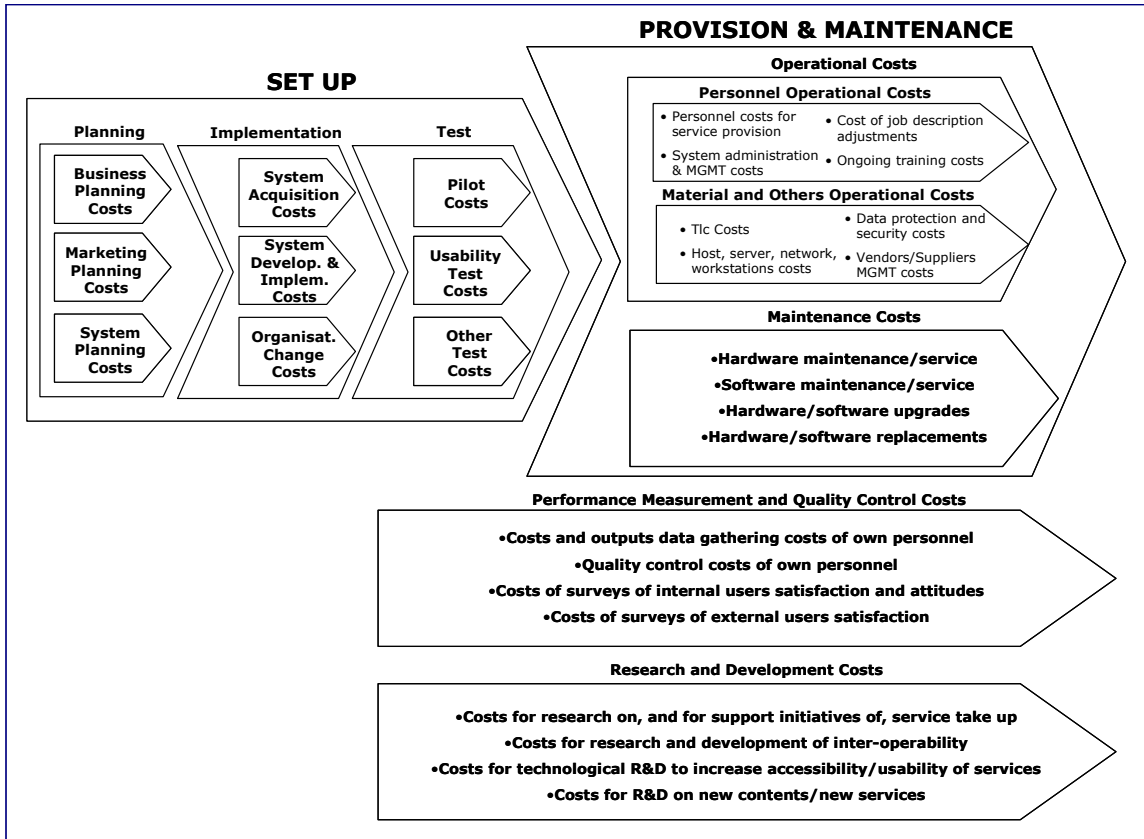
In this paragraph we present eGEP, a more pragmatic proposal for the definition of a Cost Element Structure methodology to identify and monitor eGovernment costs, which, if compared with the other methodologies surveyed, provides a contribution in terms of comprehensiveness and of a better conceptual organisation.

The use of such proposed methodology when an eGovernment project is planned and implemented (set up) and to subsequently monitor the cost of providing and maintaining the running service, would already represent a 'first stage' improvement with respect to the current state of the art. It would yield the first 'low hanging fruits' of having more reliable information on all elements of costs to be considered for the set up, provision and maintenance of eGovernment services.

As illustrated in Exhibit 1 below, in presenting our own conceptual organisation of different group of eGovernment costs we used, precisely, the three basic elements already identified in the Tender terms of reference of this Modinis Study where the objective of the Expenditure study is defined as 'identify and analyse the costs of setting-up, providing and maintaining eGovernment services in the European Union'.

To this three-fold distinction, on the basis of the sources screened and of our own approach to eGovernment, we added two additional blocks. First, the cost for the activities of performance measurement and quality control that we think any public agency providing online services should carry out *ad hoc* for such services. Second, the costs for research and development activities, here intended in the broadest sense of the word, and not limited to strictly technological R&D.

Exhibit 1: Synthetic Snapshot of eGovernment Costs by Phases



The overall conceptual framework sketched in the Exhibit above, is further operationalised in table 1 below.

Table 1: eGovernment Cost Element Structure (1/2)

SET UP
<p><u>Planning Phase</u></p> <p>1. Business Planning Costs for 1.1 Business case development (Own Personnel, OP; External Advisors/Suppliers, EAS) 1.2 Option Analysis (OP/EA) 1.3. Due Diligence / Plan Audit (OP/EA)</p>
<p>2. Marketing Planning Costs for 2.1 Market/users research (target and target needs identification, OP/EAS) 2.2 Communication and launch strategy definition(OP/EAS) 2.3. Communication kit preparation (OP/EAS)</p>
<p>3. System planning costs for 3.1 Identification of Hardware requirements (OP/EAS) 3.2 Identification of Software requirements (OP/EAS) 3.3 As is analysis of business processes and identification of reorganisation requirements (OP/EAS) 3.4 As is analysis of existing skills and identification of training and new hiring requirements (OP/EAS) 3.5 Preparation of tendering documentation for expected external suppliers support</p>
<p><u>Implementation Phase</u></p> <p>4. System Acquisition costs for 4.1 Hardware (host, servers, network operation, workstations) 4.2 Software (license fees) 4.3 Connectivity 4.4 Tendering process management and subsequent vendors/supplier management (OP)</p>
<p>5. System Development and implementation costs. 5.1 Design/requirements definition costs (OP/EAS) 5.1.1 Requirements and data architecture 5.1.2 User Interface (usability/accessibility) 5.1.3 Network Architecture 5.1.4 Security Architecture 5.2 Development costs (OP/EA) 5.2.1 System integration 5.2.2 Software customisation 5.2.3 Installation 5.2.4 System Engineering 5.2.5 Cleansing, conversion and import of existing data 5.3 Development Support costs (Programme Management, OP/EAS)</p>
<p>6. Costs of organisational change (OP plus EAS, plus intangible costs, see below) 6.1 Costs of internal reorganisation 6.2 Costs of inter-institutional reorganisation and cooperation 6.3 Costs of Change Management 6.4 Costs of initial training</p>
PROVISION
<p>7. Own Personnel Operational Costs 7.1 Costs of personnel using the system to provide the online service 7.2 Costs of IT specialised personnel to administer and manage the system 7.3 Costs of ongoing job description/organisational processes adjustments 7.4 Costs of ongoing training 7.5 Costs of customers help desk (pro-rata) 7.6 Costs of call centres (pro-rata)</p>

Continued

PROVISION (Continued)
8. Material Operational Costs 8.1 Line/communication costs (pro-rata) 8.2 Host, server, network costs (pro-rata) 8.3 Workstations, computer costs (pro-rata) 8.4 Data protection and computer costs 8.5 Energy and space costs (pro-rata)
9. Other operational costs 9.1 Costs for the services of external advisors and/or suppliers 9.2 Vendors/Supplier Management Costs (Own Personnel)
MAINTENANCE
10 Hardware maintenance/service costs (OP/EAS) 11 Software maintenance/service costs (OP/EAS) 12 Hardware/software upgrades costs 13 Hardware/software replacements costs
PERFORMANCE MEASUREMENT AND QUALITY CONTROL
14. Own personnel costs for input and output data gathering activity 15. Own personnel costs for quality inspection/certification (including technical software evaluation) 16. Costs of surveys of internal users satisfaction and attitudes 17. Costs of surveys of external users satisfaction
RESEARCH AND DEVELOPMENT
18. Costs for research on, and for initiatives in support of, service take up (OP/EAS) 19. Costs for research and development of inter-operability (OP/EAS) 20. Costs for technological R&D to increase accessibility/usability of services (OP/EAS) 21. Costs for R&D on new contents/new services (OP/EAS)

For reason of space in the table above we used the generic expression “own personnel” to identify all items requiring the work time of public servants that should be tracked, valorised and assigned to the cost of a given eGovernment service. Naturally this personnel can be of different levels.

We must stress, however, that the case studies developed and other evidence suggest that senior public administration executives (henceforth simply Management) must play a key role throughout the various phases identified above (and especially for performance measurement and quality control) to ensure the success of eGovernment services, and thus the valorisation of their time should represent a fairly significant share of the full costs.

2.3. The Intangible Dimension

We further discuss Item 6 of table 1 above (cost of organisational change) by touching the issue of less tangible and/or hidden costs.

The intangible and often unmeasured costs associated with investment in ICT is a topic widely discussed in the management and academic literature with regard to the private sector and, especially, to the world of the larger US corporations listed in the stock market. Such a body of literature provides robust evidence on the importance of changes in business processes, organisational structures, human resource training, innovation in supply chain and customer relationship management, as crucial

complementary inputs to fully leverage the potential of IT investments²⁹. Just to cite an example, a study by Gormley *et al* showed that the true cost required to deploy a packaged ERP system tends to be seven times as large as the purchase value of the ERP application itself, as it also requires the re-designing of tasks, jobs, business processes, etc³⁰.

The well-known MIT economist Erik Brynjolfsson et al, in a number of working papers and articles, using firm-level evidence from a large data-set of more than 1000 large US corporations, suggests that such a complementary change can be considered as "organisational capital investment" (remaining intangible as they are not recorded) that may end up being up to 10 times as large as the direct investments in hardware formally recorded and capitalized in firm accounting systems³¹.

A basic argument of such contributions is the following: very robust empirical evidence shows that investment in hardware produces "excess returns" relative to their capitalized value both in terms of financial market evaluation and of productivity that can be taken as an indirect measure for the complementary and intangible inputs defined as "organisational capital".

As they put it 'successful projects require enormous management attention, worker training, and changes in seemingly unrelated areas of the business and perhaps the entire industry'³².

This argument is very relevant for our purposes as it provides a proxy indication, at least, of what is likely to be the ratio between investments in tangible assets

²⁹ For empirical evidence see Bresnahan, T., E. Brynjolfsson, and L. Hitt, "Information Technology, Workplace Organization and the Demand for Skilled Labor: Firm-level Evidence," *Quarterly Journal of Economics* 117:1 (2002), pp. 339-376. A general overview of such studies is presented in Brynjolfsson, E., and L. Hitt, "Beyond Computation: Information Technology, Organizational Transformation and Business Performance," *Journal of Economic Perspectives* 14:4 (2000), 23-48.

³⁰ Gormley, J., W. Bluestein, J. Gatoff and H. Chun, "The Runaway Costs of Packaged Applications," The Forrester Report, Vol. 3, No. 5, Forrester Research, Inc., Cambridge, MA, 1998.

³¹ In the following paragraph, in a very simplified fashion, we summarise the arguments and econometric analysis presented in the following contributions:

- 1) Brynjolfsson, E. and S. Yang, "The Intangible Costs and Benefits of Computer Investments: Evidence from the Financial Markets", MIT Sloan School of Management Working paper, 1999 (<http://ebusiness.mit.edu/erik/ITQ00-11-25.pdf>, accessed January 2006);
- 2) Brynjolfsson, E., L. Hitt, and S. Yang, "Intangible Assets: Computers and Organizational Capital", MIT Sloan School of Management Working paper, 2002 (http://ebusiness.mit.edu/research/papers/138_Erik_Intangible_Assets.pdf , accessed January 2006);
- 3) Brynjolfsson, E., L. Hitt, and S. Yang, "Intangible Assets: How the Interaction of Computers and Organizational Structure Affects Stock Market Valuations," *Brookings Papers on Economic Activity: Macroeconomics* 1 (2002), 137-199.
- 4) Brynjolfsson, E., and L. Hitt, "Computing Productivity: Firm-Level Evidence", *The Review of Economics and Statistics*, 85: 4 (2003), pp. 793-808.

³² Brynjolfsson, E., L. Hitt, and S. Yang, "Intangible Assets: Computers and Organizational Capital", op. cit., p. 9.

(hardware and software) and in intangible assets (management, re-organisation, re-training, etc).

For instance, the data from the financial markets used by the authors shows that an increase of one dollar in the quantity of installed computer (read hardware in general) by a given firm is strongly correlated with a 10 dollar increase in the financial markets evaluation of that firm. While the analysis is quite sophisticated, the basic hypothesis is the following:

For the high market valuation of installed computer capital to persist across eight years and across different sectors of the economy, it must reflect commensurately high costs of adjustments and integration. If not, firms would simply purchase more computer capital and arbitrage away any difference between the value of installed computer capital and computers on the open market³³.

In other words the excess returns in capital investments in hardware must reflect the intangible cost incurred to make the investment successful. The two possible sources explaining the 1-9 dollar ratio between hardware investment and market valuation are, according to the authors:

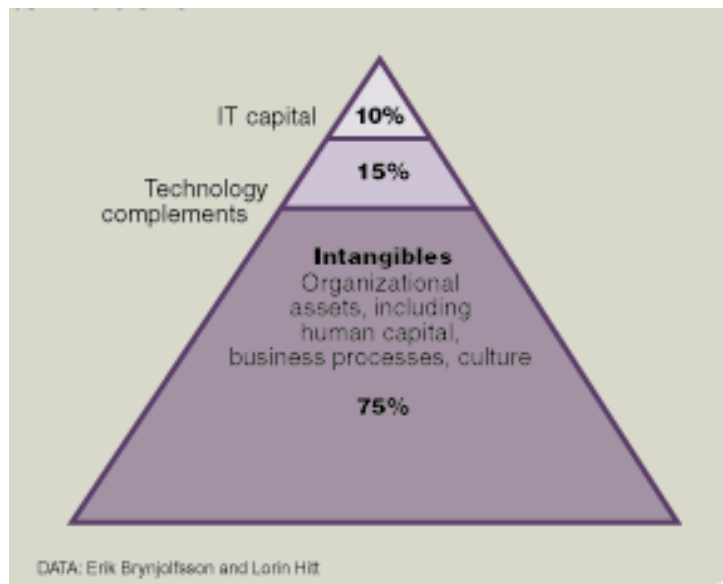
1. The capitalized value of purchased and internally developed software;
2. The capitalized value of the costs that firms incur when implementing organizational changes to harness the potential of computerization.

Tackling the same issue from a different perspective of hardware investment contribution to productivity, Brynjolfsson and Hitt found that: a) after 1 year the contribution of hardware is equal to its cost (it contributes to output but not to productivity); b) the productivity and output contributions associated with hardware investments become up to five times greater than the value of such investments over longer time periods (5 to 7 years)³⁴. The authors conclude that, while only a part of this excess return can be assigned to technical complements to hardware investments – by technical complements is meant software, communication and networking equipment, etc – these are mostly assigned to the complementary inputs in terms of “organisational capital”.

³³ Brynjolfsson, E. and S. Yang, “The Intangible Costs and Benefits of Computer Investments...”, *op. cit.* p. 31.

³⁴ Brynjolfsson, E., and L. Hitt, “Computing Productivity: Firm-Level Evidence”, *op. cit.*

Exhibit 2 Brynjolfsson Benchmark



Source: Brynjolfsson, E. "The IT Productivity Gap", *Optimize Magazine*, Issue 22, July 2003 (<http://www.optimize.com/issue/021/roi.htm>)

The Exhibit above reports a benchmark taken from an article published by Brynjolfsson in a managerial magazine (see Exhibit source) where he suggests a 1 to 3 ratio between hardware & software on the one hand and broadly defined "organisational capital" on the other. If we take this benchmark as an indirect proxy to measure intangible costs related to IT projects, we would have to estimate that for every \$1 spent in hardware and software, firms that successfully leveraged such investments have spent as much as \$3 in organisational intangibles. In the more academic articles mentioned earlier, however, Brynjolfsson et al present a possible range of such ratios, leading to a more balanced picture. In explaining the 1-9 ratio between \$1 of computer investment and its evaluation by the financial markets, they suggest that up to \$4 may be assigned to software, thus we would have a 1-1 ratio between Hardware & Software and intangible organisational investments (5 dollars vs 5 dollars)³⁵. In the explanation of the longer term 1-5 ratio between hardware and productivity growth, they concede that software could account for up to 2 points of the ratio and thus we would again have a 1-1 ratio between Hardware & Software and intangible organisational investments³⁶.

In conclusion we can derive the conservative estimate from such analysis that for \$1 spent in hardware and software, there is at least \$1 of intangible investments in broadly defined "organisational capital".

³⁵ Brynjolfsson, E. and S. Yang, "The Intangible Costs and Benefits of Computer Investments...", *op. cit.*

³⁶ Brynjolfsson, E., and L. Hitt, "Computing Productivity: Firm-Level Evidence", *op. cit.*

The quite peculiar context from which this preliminary indication is taken must be stressed again, that is to say, the universe of the 1000 largest US corporations. Unfortunately similar empirically robust analysis on the public sector is currently hardly feasible given the lack of necessary data that is comparable across the different EU Member States³⁷.

If we look concretely at our case study on the Italian Tax Agency³⁸, where the basis is a total of about €93.5 million for the period 1998-2001 (when the tax online services were fully operative), we find the following breakdown:

- Hardware and Software € 29 million
- Telecommunication and call centres € 22.5 million
- Broadly defined cost of organisational change³⁹ € 42 million

So if we simply compare hardware and software with the costs of organisational change (which includes the contribution of Management), the latter would be substantially bigger. On the other hand, adding the TLC and call centres costs to hardware and software, we get a breakdown of 55% for ICT total costs and 45% of the cost of organisational change. This comes quite close to the 1-1 more conservative benchmark derived from the work of Brynjolfsson et al. The other case studies on the other hand suggest larger shares for ICT and lower ones for the cost of organisational change (in the range of 65% to 35%)⁴⁰.

The above analysis and the insights from the case studies allow us, however, to provide a list of items that should be considered in future by public agencies in order to have a full view of eGovernment costs that also include the intangible dimension.

In the first instance, one could pragmatically decide to measure the main intangible costs using the amount spent for services (IT consulting, management consulting re-organisation and change management services and for formal training provided by external suppliers), as a proxy indicator which is actually the choice we adopted in the aggregate quantification of ICT and eGovernment Expenditure presented in Section 4.

This, however, is an under-estimation of such costs since it misses the fact that to implement and carry on the necessary organisational change, besides external

³⁷ Apart from the obvious fact that there is no financial evaluation data for public administration organisations, even the data on output is quite problematic in performing analyses such as those from Brynjolfsson *et al.*

³⁸ See full details in the *Expenditure Study Compendium* (par. 2.2).

³⁹ Re-organisation €17 million, Change Management €14 million, training €11 million. These are estimates the eGEP team has reconstructed from documentation and through interviews.

⁴⁰ This difference could also depend on the different level of details in the estimate produced. In the case of the Italian Tax Agency, given the close relations (the Agency presented a letter of interest in support of the Consortium bid for the Tender), we were able to access a large amount of documentation and conduct several interviews. In the other case studies we were only provided with the information formally elaborated by the various agencies.

services, public agencies will have to deploy the working time of senior executive and of its more operational personnel, thus probably incurring in temporary decreases of output. Moreover, the management of change will have impact on human resource management and will possibly require some financial disbursements to make the redeployment and/or release of personnel possible. There are actually at least four components one would have to add to the emergent and tangible costs of purchasing external support services (consulting and training).

First, one would have to add the total own personnel Full Time Equivalent (FTE) cost consumed for implementing re-organisation and change management activities , or for attending training courses. Second, the more 'physiological' decrease in productivity due to the initial familiarisation with the new business processes and the use of the new IT system, as well as the cost of non-budgeted training on the job informal activities should be estimated.

Third, a more 'pathological' cost may derive from 'worsening organisational climate' (people being redeployed, transferred to new jobs and/or locations, etc) or from 'adverse attitudes and dissatisfaction' of users with respect to the new system.

Finally, the cost of personnel redeployment must be considered (either as part of change management costs or of re-organisation costs) an aspect that finds strong empirical evidence in the Italian Tax Agency case study. This cost includes: a) the FTE of top management spent for negotiations with trade unions; b) the FTE of Human Resources department senior level personnel spent for outplacement, early retirement, and job transfer activities; c) The financial inducements/compensations to be paid to redeployed/transferred personnel (determined in the agreement reached with trade unions); d) the financial costs implied in early retirement arrangements.

Therefore a full measure for the costs of organisational change would be the following:

- Cost of internal reorganisation:
 - ✓ Valorisation of FTE consumed by internal employees for implementing the re-organisation;
 - ✓ Valorisation (calculated in terms of opportunity costs) of output decreases due to the re-organisation;
 - ✓ Fees paid to consultants / consulting company for re-organisation services
- Cost of inter-institutional re-organisation and cooperation (the **joined-up government** dimension):
 - ✓ Valorisation of FTE consumed by internal employees for meetings with representatives of cooperating public agencies;
 - ✓ Valorisation of FTE consumed by internal employees for developing new administrative/procedural documentation and protocol supporting inter-institutional cooperation;
 - ✓ Tangible costs for travel and other expenses;

- Cost of Change Management:
 - ✓ Valorisation of FTE of top management and HR senior personnel for governing change;
 - ✓ Valorisation (calculated in terms of opportunity costs) of general productivity decrease due to 'worsening organisational climate' and 'adverse attitudes and dissatisfaction' of users;
 - ✓ Tangible and valorised costs of personnel redeployment as defined above;
 - ✓ Fees paid to consultants / consulting company for change management services (internal communication and consensus building campaign);
- Cost of Training:
 - ✓ Valorisation of FTE consumed by internal employees for attending training courses;
 - ✓ Valorisation of FTE consumed by internal employees in non-budgeted on-the-job training activities;
 - ✓ Valorisation (calculated in terms of opportunity costs) of output decreases due to users' familiarisation with new system;
 - ✓ Valorisation of formally budgeted training courses provided by internal department;
 - ✓ Fees paid for formally budgeted training courses provided by external suppliers.

A very rough and aggregate calculation to show the relations between the tangible and intangible costs of training, only for the sake of example, can be presented by using the data on Italian total public administration expenditure for ICT related training reported in the table below.

Table 2 Italian Total Public Administration⁴¹ Expenditure of ICT Related Training and other contextual parameters (2003)

Total number of public servants Column (1)	Total amount spent for salary payments Column (2)	Total amount spent for ICT related training courses Column (3)	Average days of training per public servant Column (4)
755.587	€ 26.008.862.323	€ 41.663.524	1,3

Source: Presidenza del Consiglio dei Ministri, *7o Rapporto sulla formazione pubblica*, Roma, 2004 (<http://www.sspa.it/?p=1074>)

The total tangible cost of ICT related training in 2003 was about €41 million. Italian civil servants spent on average 1,3 working days attending ICT related training courses. The average cost per day of a public servant to the public budget is €156⁴². So if we multiply €156 by the number of days in training we obtain €203 that can be considered an average proxy for the opportunity cost of having one civil servant attending a training course instead of performing his/her usual work. Multiplying €203 by Column (1) in the table above (total number of public servants), we obtain a total

⁴¹ Includes Central, Regional, and Local Public Administration (excludes the National Health System).

⁴² Obtained dividing Column (2) of Table 2 by 220 days.

of about €153 million, which is a total proxy of the intangible cost of training. So a rough estimate of the total cost of training would be:

€41 million (tangible cost) + €153 million (intangible cost) = €194 million (total cost)

Under this estimate, the intangible costs are about three times the size of the tangible costs. Naturally this is a very rough estimate calculated on centrally aggregated numbers in only one country, and cannot be taken as a benchmark. This sort of exercise should be done at the micro level in each single public agency. This exercise gives at least a rough estimate of how intangible costs can be considerably higher than tangible ones.

A similar exercise for the cost of re-organisation and change management starting from the tangible costs for broadly defined consulting services is not viable. First, no centrally aggregated report similar to that reported above has been found. Second, even if the total expenditure by public administration in consulting services in a given country would be available, it would not provide the days spent by civil servants in overseeing and cooperating with the consultants. Furthermore, once a business process reengineering project has been completed through the intervention of a consulting company, the public agency involved will still have to invest considerable effort to make it operative and have its employees adapt to it. This final consideration hints thus at more sophisticated cost monitoring methodology, which is the topic of the next paragraph.

2.4. The Next Stage: Activity Base Costing

A more sophisticated and advanced methodology to monitor the costs of eGovernment, in such a way as to best capture intangible costs also, would be the so-called Activity Based Costing (ABC)⁴³. This would be a leading-edge choice for EU public administrations, but our desk research shows that it is being adopted or recommended in countries such as the US and Australia, and we also found one case of application in Europe regarding the Greek Tax Agency⁴⁴.

⁴³ The revision of traditional approaches and the proposal of new more sophisticated techniques such as **ABC** reflects the tremendous change that has occurred in the period of time considered, also as a result of ICT. The automation and integration of business processes, product/services differentiation and personalisation strategies, the increasing attention to quality and customer satisfaction, are all factors that have increased the importance of those activities of the value chain that were less prominent in a more standardised Fordist model of organisation and received less attention in traditional cost assessment approaches where they are treated as indistinct indirect ('overhead') fixed costs. Indirect fixed costs have gained prominence over direct variable costs, and namely over direct labour. Leaving aside industry peculiarity, it can be reasonably argued that technology, marketing, distribution, R&D, quality control, customer relationship management, are contributing to the creation of value at least on an equal basis to direct labour, and in several business sectors even to a much larger degree. Therefore cost assessment techniques based mainly on direct variable costs and only partially taking into account indirect costs can produce a distorted picture of the full costing of bringing to the market a given product or of providing a given service.

⁴⁴ See E. Hadziliadis "A Methodology Framework for Calculating the Cost of e-Government Services", in M. Böhlen et al. (Eds.): TCGOV 2005, *Lecture Notes in Artificial Intelligence* LNAI 3416, IFIP International Federation for Information Processing, Springer, pp. 247–256.

ABC is, for instance, the required cost monitoring methodology recommended by the US State of Tennessee in its dedicated eGovernment portal⁴⁵. This is not surprising since the OBM Circular A-76, cited earlier, explicitly proposes the concept of Most Efficient Organisation as an agency which, among other things, uses ABC⁴⁶. The Australian National Audit Office (ANOVA) in its report on Measuring the Efficiency and Effectiveness of E-Government explicitly criticises the fact most agencies did not use Activity Based Costing to monitor the costs of their services but other less sophisticated methods that hinder the comparability of results across agencies and thus the aggregation of results. It is evident that ANOVA considers ABC not only a better cost monitoring technique at a micro level but only one that would enable the gathering of comparable costs into national level figures⁴⁷.

ABC is a process-driven full costing system that presupposes a thorough analysis and mapping of the work processes and activities needed for the provision of the service for which the assessment of cost is sought, that is for the **cost objective**. Second, it requires the identification of data gathering methods to ensure that the information used is objective and does not entail subjective assumptions as in the case of traditional pro-rata allocation of overhead costs.

On the basis of this supporting information, **ABC** first foresees the imputation of overhead costs to each of the activities that have generated them, and then assigns the cost of each activity to the **cost objective** (product, service, project) requiring the activity. In other words such an approach models the relationships between products/services and the resources used in their production/provision at all stages of the relevant business processes (see graphic comparison between traditional and **ABC** approaches in Exhibit 3 below). The idea behind **ABC** is quite simple: **output consumes activities that in turn have consumed costs associated with resources**.

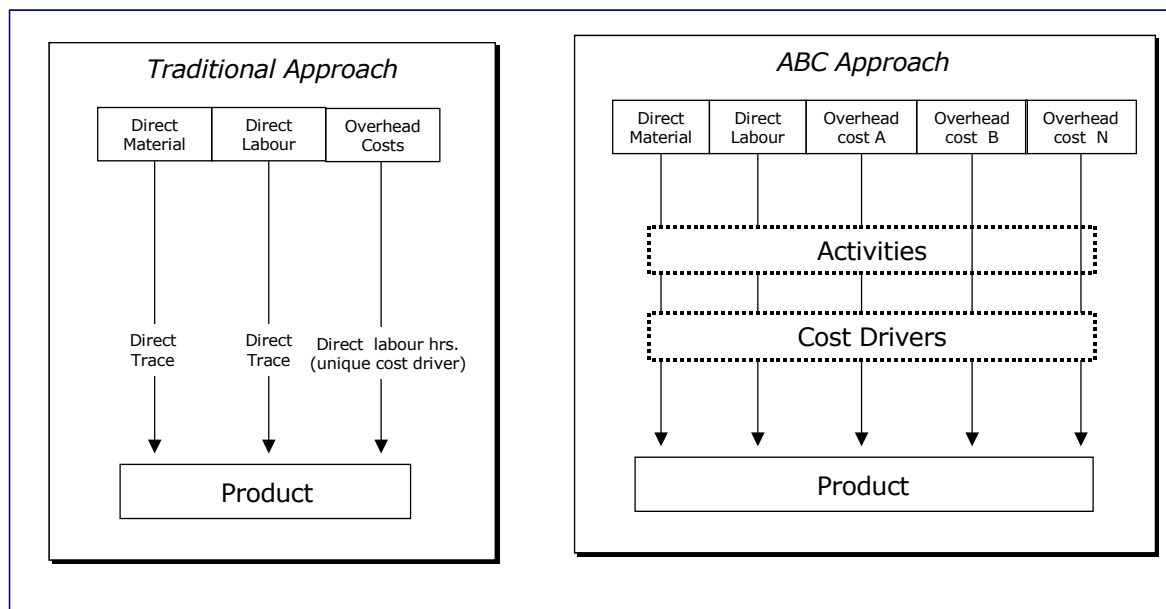
A fundamental building block in such an approach is the **cost driver**, defined as *the concrete mechanism generating the actual consumption of activity/resources by a given cost objective*. Example: if the quality control activity is an overhead cost to be charged to eGovernment service X, the cost driver unit for service X is the number of quality inspections performed specifically for that service.

⁴⁵ See <http://www.state.tn.us/guidelines/pg.html>.

⁴⁶ Executive Office Of The President Office Of Management And Budget Washington, DC 20503 May 29, 2003 Circular No. A-76 (Revised) (<http://www.sba.gov/a76/circular.pdf> , accessed January 2006), p. B-10.

⁴⁷ Australian National Audit Office (ANOVA), *Measuring the Efficiency and Effectiveness of E-Government*, Audit Report No.26 2004-05 (<http://www.anao.gov.au/WebSite.nsf/Publications/2C3CDF64278872A9CA256FA2007F445E>, accessed January 2006), Chapter 3.

Exhibit 3: Traditional and ABC Approaches: Sketch Comparison



It is important to underline that performing an **ABC** analysis, not only generates a more reliable assessment of the full cost of providing a service, but it also enables one to identify the levers for improving the efficiency and effectiveness of service provision. It identifies value added activities (those whose output directly contributes to the product/service requirements) and enables one to distinguish between primary and secondary activities. The ability to place costs on activities and their output provides a clear metric for depicting the real cost of the system and serves as a reference level for continuous improvement. The identification of value-added and non value-added activities is one of the important contributions of **ABC**. Non value-added activities cause delay, excess, or variation, and therefore are targets for elimination or reduction in improving the business processes. On the contrary, value added activities can be improved through reorganisation.

Performing an Activity Based Costing analysis is definitely a time-consuming and fairly complex undertaking. Moreover, given the current state of the art, it would be quite a leading-edge initiative for the public administration context. Additionally, besides considering its economic and organisational feasibility, one may want to ask whether it is really relevant and/or needed for eGovernment and, more in general, for public administration.

We are convinced that the answer to such questions is positive and that **ABC** is relevant for a number of reasons. First, the context of public administration is changing and, also due to eGovernment and general ICT investments, is converging toward the same set of conditions that, in the private sector, have led to the critique

of traditional cost accounting method and to the elaboration of new more sophisticated approaches such as **ABC**. Second, since we posit that, in the next few years at least, it will still be needed to measure impacts and costs of eGovernment services separately from those of the public administrations running them, ABC yield much better and reliable results than other traditional methods⁴⁸. A third ancillary reason justifying the adoption of **ABC** to eGovernment is that the activities required to perform it (the process based mapping of activities) can be instrumental also towards other goals such as re-organisation or the adoption of a performance management system. Last but not least, ABC is also an instrument for improving efficiency and effectiveness and for linking costs to performance and would thus be the perfect match for the introduction of an eGovernment Measurement Framework and facilitate the differential analysis often needed to quantify the potential benefits in terms of the concrete impacts of eGovernment.

We conclude this paragraph by proposing a possible more limited and feasible use of the logic implied in ABC that would be less demanding on public administrations while potentially still yielding some low hanging fruit.

The idea is very simple and foresees the following steps:

1. In the planning phase elaborate the Cost Element Structure, including estimates of indirect costs during provision and maintenance;
2. Perform, at least, a very simple value-chain based segmentation of work processes and activities;
3. Identify the officers responsible for each identified segment of activities and interview them several times in the course of the year asking information of work processes and uses of resources;
4. At the end of the year, gather costs from the official recording system;
5. Use information from the interviews and from administrative records and calculate costs to be compared with the estimate initially included in the Cost Element Structure.

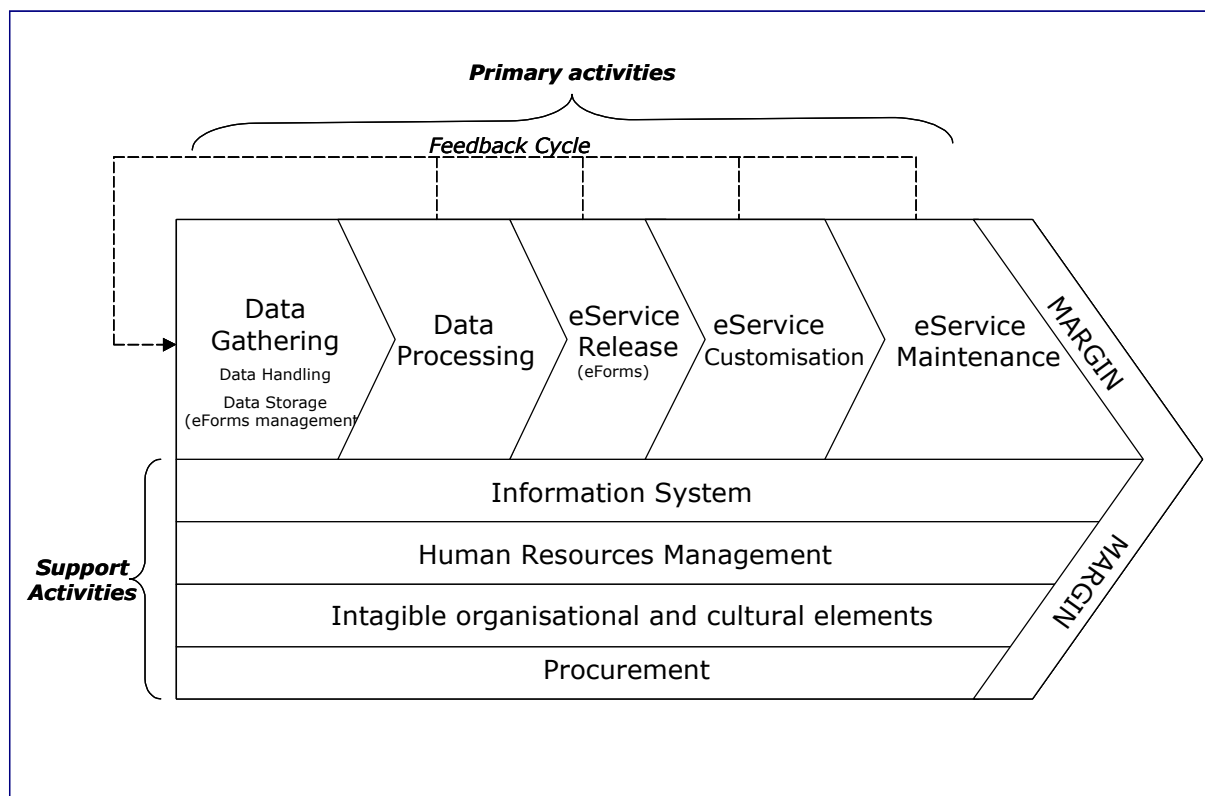
The value-chain analysis, popularised by Michael Porter in his 1985 best-seller⁴⁹, categorizes the generic value-adding activities of an organization. Once, depending on the characteristic of the analysed organisation, the segment of activities are identified and distinguished into "primary activities" and "support activities", the costs and value

⁴⁸ As illustrated in the Italian Tax Agency case studies, it was possible to go in some depth in the analysis of the costs of setting up the tax online services, but it was much more difficult to identify the full operating budget now that the system is up and running. Without a clear understanding of processes and activities the recording and accounting system of the Agency was not able to estimate how much of employee time went exactly into the operation and maintenance of the G2C tax online service. The same applies to the cost of running the agency call centres for which it was not possible to determine exactly how much could be imputed exclusively to the tax online services.

⁴⁹ M. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance*, New York, The Free Press, 1985. For an application of the value chain approach to eGovernment see A Wassenaar, "eGovernment Value Chain Model", Conference Publications, IEEE, 2000, pp. 289-293.

drivers are identified for each value. The Exhibit below provides an example of the value-chain segmentation adapted to an eGovernment project

Exhibit 4: Example Value Chain Segmentation of Processes/Activities

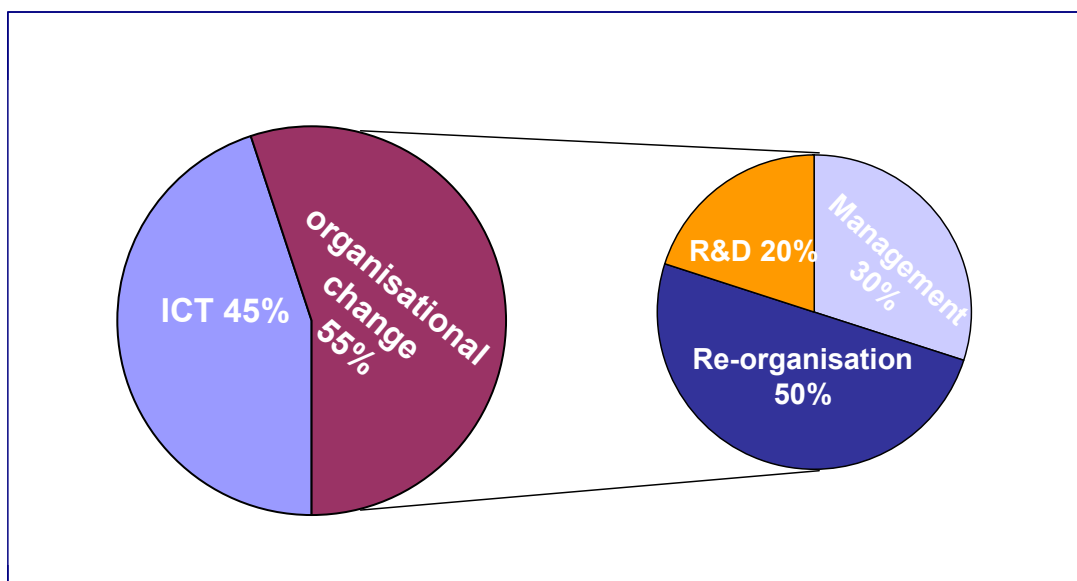


2.5. eGEP 'Rule of Thumb' for Cost Breakdown

By way of concluding this Section, after the presentation of the eGEP detailed Cost Element Structure, the discussion on intangibles, and the illustration of the possible increased precision that can be derived applying Activity Base Costing to monitor eGovernment costs, we will propose a micro-level simplified and intuitive 'rule of thumb' practical guideline for the main cost components and their breakdown to be considered over an average five year perspective (from planning to full blown services provision) for a relatively large eGovernment project.

The percentage break-down presented in Exhibit 5 below, though based both on the sources analysed in paragraph 2.3 on the intangible costs and on our case studies, cannot be considered as entirely based on empirical evidence and also includes eGEP prescriptive evaluation of how the full investment should be split into such components.

Exhibit 5: eGEP 'Rule of thumb' for Costs Break-down



As illustrated in the larger pie in Exhibit 5, we propose a 55%:45% split between the investments in organisational change and those in ICT, which is slightly above the more conservative 50%:50% benchmark between hardware and software and organisational change that could be derived from the work of Brynjolfsson *et al* discussed in paragraph 2.3. With respect to the terminology and definition employed in such work, it must be pointed out that our definition of organisational change costs is a bit broader and includes, besides the cost of re-organisation as defined by Brynjolfsson *et al* (changes in business processes, organisational structures, human resources training, innovation in supply chain and customer relationship management), the cost of "Management" and "Research and development" as described in Exhibit 1 and table 1 of paragraph 2.2.

In order to ensure the success of an eGovernment project, senior executives in public agencies have to be involved throughout the phases (set up, provision and maintenance) supporting and overseeing the implementation of reorganisation and also man, devise and use performance measurement and quality control instruments.

The costs for R&D here are intended in the broadest sense and not limited to strictly technological R&D. They would include research on user needs and on the ways to increase take up, exploration on how to better target services and on improving usability, etc.

It must be stressed that, if compared to the analysis of Brynjolfsson *et al*, in the counterpart to organisational change costs, we added communication costs to those of hardware and software. Therefore the 55%:45% split in favour of the cost of organisational change is definitively not conservative. We consider, in fact, the complementary organisational changes needed to fully benefit from the potentiality inherent in ICT investments in the case of more demanding and complex eGovernment projects than those implemented in successful large corporations. The

peculiar context of public administration, with its universalistic mission of serving multiple constituencies and the constraints faced by existing bureaucratic rules and boundaries, not to mention the challenges of inter-institutional cooperation and of providing a new set of skills to public servants, requires efforts that, if deployed and fully accounted for by cost monitoring methodologies, should be at the least 10% higher than the tangible investments in ICT.

Finally, it is worth repeating that what is synthesized in Exhibit 5 above is a 'rule of thumb' partially informed by empirical evidence and partially inspired by eGEP view of how eGovernment investments should be split. Thus, there is no direct relation between such proposed breakdown and that presented in Section 4 in the quantitative assessment of eGovernment Expenditure

3. eGovernment Financing Overview

On the basis of mostly secondary sources, integrated with telephone interviews with national contact persons, we have been able to compile country profiles that illustrate the main financing solution adopted for eGovernment in all of the 25 EU Member States⁵⁰. In paragraph 3.2 we will provide a preliminary overview of the eGovernment financing landscape in the 25 EU Member States, based on the sources screened for the elaboration of the mentioned country fiches. Paragraph 3.2 is preceded in paragraph 3.1 by an illustration of possible financing mechanisms, in general, and followed in paragraph 3.3 by some insights from the US experience. Finally, in paragraph 3.4, a preliminary assessment of the various sources of funding advantages and disadvantages and some forward looking considerations are presented.

3.1. Overview of eGovernment funding models

As put by Heeks⁵¹, governments have been using information technology and communication supports for various purposes well before eGovernment became a popular term. This is why 'funding for core information technology is a well established budget item within most governments'⁵². On the other hand, the new services envisaged by innovative and transformative eGovernment projects do not yet have a consolidated "budget home."⁵³ According to Riggs et al, 'funding for new

⁵⁰ See section 3 of the *Expenditure Study Compendium*.

⁵¹ See <http://www.egov4dev.org/egovdefn.htm>

⁵² K. A. Griggs and R. Wild, *Financing e-Government: A Study of Issues, Models, and Funding Strategies*, unpublished paper presented at the 2005 European Conference on Electronic Government Antwerp, Belgium (obtained upon request from the authors), p.1.

⁵³ *Ibid.*

governmental IT projects is driven primarily by budget contingencies and secondly by demand. Approximately 98% of the U.S. federal IT budget is for ongoing operations (Office of Management & Budgets 2005)⁵⁴.

A case in point of this aspect is illustrated in the data contained in the annual report on the status of informatics in Italian central public administrations recently published by the Italian National Centre for Information Technology in Public Administration (CNIPA): out of about 140 items financed through central budget appropriation worth more than €2 million, only 30 can be considered new eGovernment projects, whereas the majority are incremental investments for the evolution or upgrade of existing information systems and applications⁵⁵.

Several experts from leading market research companies we interviewed on the topic of ICT/eGovernment expenditure and financing, affirmed that more reliable estimates can be produced on public administration ICT expenditure than on eGovernment precisely due to the financing mechanisms, that are well established and create repeated inertial funding for information technology but are more erratic and cyclical for eGovernment projects⁵⁶.

In short, most government's budgets have a traditional annual space for IT and initiatives receiving funding are often those that focus on incremental improvements over the previous year. This approach leaves relatively less space for transformative multi-annual eGovernment projects.

While the scenario briefly sketched above is the established structural picture for government budget financing of eGovernment, this does not mean that there are no eGovernment financing channels at all in government budgets and in other public source of funding, aside from other innovative funding solutions involving various forms of what can be called Public-Private Partnership (PPP). These various mechanisms are briefly illustrated below.

Vertical Funding. Indeed eGovernment projects, especially those of central departments and agencies, have also been and are being financed in EU countries and the US through the most traditional and consolidated financing approach termed Vertical Approach⁵⁷. This expression refers to the traditional management of funding and projects within organizational boundaries or, as they are often referred to,

⁵⁴ *Ibid.*

⁵⁵ CNIPA, *Lo stato dell'informatizzazione nella pubblica amministrazione, Relazione Annuale 2004*, Roma, giugno 2005, pp. 144-147.

⁵⁶ Phone call interviews with Scott Brian of KableNet (August 8, 2005); Interview with Gabriella Cattaneo and Massimiliano Claps of IDC (Milan, 15 September 2005); interview with Andra DiMaio, Gartner Group (Milan, 16 September 2005).

⁵⁷ See F. Reeder, "Identifying effective funding models for e-government", paper presented at the OECD e-Government Project Seminar – Strategic E-Government Implementation, Paris June 20-21, 2002, p. 5.

stovepipes. Vertical funding requires individual departments or agencies in need of funding for their eGovernment projects to compete for government budget appropriations with other claims for investments within the same vertical sector/program of the public administration. Such approach is in line with the more traditional concept of public management accountability of providing resources to one organisation and holding it responsible for defined institutional objectives. This traditional approach is used for funding eGovernment projects (though on average the funds are not comparable to those obtained by more traditional IT investments) in most EU countries and the US. A typical example is the Spending Review Process and connected Public Service Agreement (PSA) that central departments and agencies have to go through and agree upon with the HM Treasury in the United Kingdom⁵⁸: government departments bid for eGovernment or ICT funding in the same way as for any other planned expenditure.

Horizontal Inter-Institutional Funding. This approach foresees an agreement among a number of departments having a common interest and all deriving, though to different degrees, some benefits from generally large multi-annual eGovernment project (often of an infrastructural nature). Funding is either drawn from the operational budget of the participating departments or, for large-size investments, is allocated from their general government budget. In such a approach, generally, one department plays the lead role or such role is performed by a central monitoring department, like for instance the Office of Management Budget in the US. While this approach emerged precisely to address some of the peculiarities of multi-annual eGovernment projects, to date it is not as widespread as has been advertised and discussed. In certain cases the project is financed only from the budget of the lead department, but the fact that the project benefits also other departments is then reflected into future budget allocations⁵⁹. An example of such as approach to financing cross-cutting initiatives can be found in Slovenia, where resources from the different ministerial budgets are pooled together and invested under the authority of the Ministry of Public

⁵⁸ This mechanism was illustrated to eGEP team during the field mission to the UK (May 9-10 2005) by representatives of the Cabinet Office eGovernment Unit, as well as by Stephen Jenner, Portfolio Manager of the UK Criminal Justice IT.

⁵⁹ For instance in the UK, the Department of Trade and Industry financed the Business to Government Portal entirely from its budget, although the portal delivers services also from the Inland Revenue and the Department of Employment, whose Staff working on the project was assigned to the Department of Trade and Industry. Since the Portal supposedly should diminish the demand on the other participating departments, this is considered in the Spending Reviews and reflected in their spending allocations (Reeder, *op. cit.*, p. 20).

Administration⁶⁰. In France several administrative bodies cooperate in cross-cutting projects by establishing shared funds, the so-called Fonds mutualisés⁶¹

Centralised Ad Hoc and Innovation Funds. In this case a central unit of government allocates/coordinates⁶² a pool of resources to high priority and/or large-scale and/or innovative eGovernment initiatives that might not obtain initial financing using other approaches. Although they represent the reallocation of *one-time revenues* and have a limited time horizon, an example of ad hoc funds are the €400 million allocated from the revenues of the UMTS auctions to the funding of regional and local eGovernment projects in Italy and managed by the Ministry of Innovation and Technology. A variant, in the sense that these are centralised but not specifically targeted only for eGovernment, are **Central Innovation Funds**, used to provide initial financing for single agency or multi-agency innovative projects that can be repaid over time from the savings achieved. An example is the **Capital Modernisation Fund** set up in the UK in 1998.

While other peculiar mechanisms or variations can be found, the three types of funding described above pretty much cover the landscape of financing based entirely on national public money. An additional public, though international, source of funding to be mentioned are the **EU Structural Funds**.

With respect to the three types of funding at national level, a very preliminary and general consideration that can be made on the basis of the secondary sources screened, is that due diligence and business case requirements seem to be relatively more demanding in the US and the UK when compared to other EU countries.

In recent years, for a number of reasons touched in paragraph 3.3 for the US context and discussed in general in paragraph 3.4, central and local governments within and outside the EU have resorted for the financing of eGovernment projects to various forms of collaboration with private companies (and at times also with professional associations, NGOs and community organisations) that can be grouped under the general umbrella label of **Public-Private-Partnership** (PPP).

Particularly prominent are various arrangements entailing the collaboration with private partners that initially finance totally, or in part, the project of a government

⁶⁰ See Ministry of Information Society, *Slovenia in the Information Society*, Ljubljana, 2003 available at [http://mid.gov.si/mid/mid.nsf/V/KACF73A1447CF53FEC1256DE50042087A/\\$file/Strategy%20RSIS%20final_20030213.pdf](http://mid.gov.si/mid/mid.nsf/V/KACF73A1447CF53FEC1256DE50042087A/$file/Strategy%20RSIS%20final_20030213.pdf).

⁶¹ eGEP phone interview with Christophe Lebeau, from the Finance Department of ADAE, September 2005.

⁶² In some cases such a central unit has a coordinating and/or decision-making role (gathers applications and selects projects to be financed) but does not actually hold the money in its own budget. This is, for instance, the case of the Ministry of Innovation and Technology with respect to the special eGovernment funds for projects presented by regions and local councils, or that of ADAE with the funds allocated to the ADELE programme.

agency. Various detailed taxonomy exist for such arrangements that are differentiated according to technicalities (i.e. convenience model, transaction model, hybrid fee, etc)⁶³. Following the Forrester Research approach, all these arrangements⁶⁴, regardless of technicalities, can be grouped under the general label of **Gains Sharing Model**, of which there are two basic variants:

- ❑ **Benefits-funded.** In this model, a project will generate incremental new revenue out of which the private partner is compensated.
- ❑ **Shared savings.** In this model the measurable savings achieved will partially go to pay the private partner.

While examples of such arrangements can be found in several EU countries, probably one of the most successful cases is that of the California pioneering Franchise Tax Board (FTB), benefit-funded tax systems realised in partnership with CGI-AMS 65. FTB estimated a return of \$7.4 million after one year of operation of the new collection system, which instead actually yielded \$42.6 million!

Such gain-sharing models are a more commercially and profit driven form of PPP and are focused mostly on the role of major private partners, usually a technology vendor. Less profit driven PPP usually foresees the participation of several public central and/or local agencies in partnership with community organisations, professional associations and other private sector players, all of whom join not for a future profit but for benefiting from the services that the eGovernment project will put in place. Even in such cases, some private technology vendor may join and be paid later out of fees and other revenues generated, but this is not the central feature of the PPP.

Finally, other possible forms of private financing of eGovernment that should be just mentioned are:

- ❑ Leasing or renting capital assets;
- ❑ Reliance on private infrastructure;
- ❑ Loans.

⁶³ One such taxonomy is presented in Riggs *et al, op. cit.*, p. 7, and a similar one can be found in *Oakland County Michigan eGovernment Strategic Plan* – February 11, 2002 (http://www.co.oakland.mi.us/egov/assets/docs/2002_strategic_plan.pdf), pp. 19-21.

⁶⁴ G. Leganza, *Gain Sharing: Transformational Procurement*, Forrester Research, December 27, 2004, p.4.

⁶⁵ On the California Franchise Tax board (FTB) experience see: a) the Council for Excellence in Government and the Federal Technology Service's report at <http://www.excelgov.org/usermedia/images/uploads/PDFs/Report.PDF>; b) FTB's own presentation at www.ftb.ca.gov/other/pbp.pdf.

3.2. The European Landscape

Following the conceptualisation presented in the previous paragraph, below is presented a selective overview of practices adopted in the 25 EU Member States.

Vertical funding

One of the most traditional vertical funding approaches is represented by the Cypriot eGovernment financing mechanism. The Cypriot accounting bill includes a budgetary chapter for the implementation of IT projects and computerisation services (Head 18.09.00.3 - Subhead 07.681 Data Processing Equipment, Software and Services). This chapter is under the control of the Ministry of Finance and the Department of Information Technology Services (henceforth DITS). All Government Departments have to go through DITS to initiate a computerisation project. Depending on the type of the project (i.e., complexity, costs, changes in established procedures or legislation, etc.), the approval for the initiation and the budget of the project is given by the Director of DITS or the Ministry of Finance, who, however, might opt to refer the request to the national Executive Board of Computerisation or to the Ministerial Committee. In order to get the final approval of budget release/payments for a particular project, this payment has to be included in the specific year's approved budget. DITS annual budget is prepared in Q1 or early Q2 of the previous year and it obtains final approval by the Ministerial Committee and the House of Representatives by late Q2 or early Q3⁶⁶.

A similar funding procedure has been adopted in Germany, where Central eGovernment initiatives have so far been managed under the recently successfully ended⁶⁷ "Bund-Online Initiative" umbrella, i.e., in the context of the Federal programme for the realisation of eServices⁶⁸. Bund-Online projects were financed by the annual budget of the involved ministries, with the Ministry of the Interior acting as supervisor. The Ministry of the Interior's supervision also encompassed the financial breakdown of funds among the Ministries taking part in cross-cutting projects. Referring to the selection criteria adopted by Federal Ministries, accepted projects had to respect the quantitative and qualitative standards set by the Federal Government Co-ordination and Advisory Agency for IT in the Federal Administration (KBSt). Within the evaluation criteria, great attention was paid to the qualitative dimension: in order

⁶⁶ eGEP phone interview to Ms Klippi Pekri, Department for Information Technology Services, September 2005.

⁶⁷ Ministry of the Interior Press Office (2005), *eGovernment-Initiative des Bundes am Ziel*, Ministry of the Interior, Berlin, available at http://www.bmi.bund.de/nn_122052/Internet/Content/Nachrichten/Pressemitteilungen/2005/08/BundOnline1.html, accessed September 2005.

⁶⁸ Bund-Online Initiative homepage: <http://www.wmsbundonline.de/>, accessed September 2005.

to achieve a positive evaluation, every project was asked to fulfil at least 80% of the established quality requirements⁶⁹.

Horizontal Inter-Institutional Funding

A horizontal funding system has been adopted in Greece, where the allocation of resources for eGovernment projects is submitted to the EU co-financed national Operational Programme for the Information Society. The programme covers a six-years period and states, for every fiscal year, the size of monetary resources every ministry can manage for implementing Information Society measures, including eServices⁷⁰. eGovernment projects are thus financed by the involved ministries, which share their own budgetary resources under the supervision of an independent managing authority. This authority is posed under the Ministry of Economy and Finance and is headed by a Special Secretary, who directly reports to the Minister⁷¹. An analogous horizontal mechanism has been adopted in Spain for the "Ciudades Digitales"⁷² (Digital Cities) project, aimed at the development of the Information Society in Spanish local communities. The project is managed by the national Ministry for Industry, Tourism and Commerce, while the central financing rate of funding does not exceed 50% of the overall project cost. Further resources are collected among regional and local administrations; furthermore, a small amount of resources is provided by private players, as showed by the following table:

Table 3: "Ciudades Digitales" 2004-2007 financing framework

Projects	UE Objective 1 Regions	Ministry for Industry, Culture and Commerce	Autonomous Community/City	Local Administrations	Private Entities	TOTAL
MURCIA	Yes	3.000	2.680	320	6.000	12.000
CASTILLA Y LEON	Yes	2.100	2.100	210		4.410
VALENCIA	Yes	3.000	3.000	180	890	7.070
CEUTA	Yes	1.502	2.852			4.354
MADRID	No	3.600	2.140	2.140	2.128	10.008
CATALUNA	No	3.600	2.160	1.440	460	7.660
ASTURIAS	Yes	3.000	1.990	1.030	1.280	7.300
CANARIAS	Yes	3.000	2.400	600		6.000
MELILLA	Yes	1.500	1.500			3.000
LA RIOJA	No	2.400	2.156	244	900	5.700
CANTABRIA	No	2.400	2.160	240		4.800
BALEARES	No	2.400	1.200	1.500		5.100
CASTILLA-LA MANCHA	Yes	3.880	3.492	388	5.783	13.543
GALICIA	Yes	2.937	1.027	1.910	326	6.199
ARAGÓN	No	3.000	2.360	900	1.000	7.260
ANDALUCIA	Yes	1.600	800	800	358	3.558
CASTILLA Y LEON (2nd phase)	Yes	1.500	1500	144	180	3.324
TOTAL		44.419	35.517	12.046	19.305	111.286

Source: Consortium elaboration from the project website.

⁶⁹ This process was illustrated to eGEP team during the field mission to Germany (June 6-7 2005) by Andreas Reisen, Head of the Bund-Online Initiative.

⁷⁰ Ministry of Economy and Finance - Secretariat for Information Society (2001), *Operational Programme Information Society*, Ministry of Economy and Finance - Secretariat for Information Society, Athens, available at <http://en.infosoc.gr/content/downloads/OPISEngedited.pdf>, accessed September 2005.

⁷¹ Ministry of Economy and Finance - Secretariat for Information Society (2001), *Operational Programme Information Society - 3rd Community Support Framework 2000-2006 for Greece*, Ministry of Economy and Finance - Secretariat for Information Society, Athens, available at http://en.infosoc.gr/content/downloads/InfoOPISen_June1.pdf, accessed September 2005.

⁷² For more information on the initiative, please refer to the website homepage, <http://www.min.es/ciudades/>, accessed September 2005.

Another clear example of a horizontally-meant eGovernment way of financing is given by the Estonian municipalities, where a number of towns gathered together under a common major body, the State Information Systems Development Centre (RIA) within the Ministry of Economic Affairs and Communication⁷³, in order to reach common interests. The purpose was to avoid an independent development of eGovernment initiatives with the risk of having services overlapping from town to town (as happened in 2000-2001). All the towns, therefore, plan separate investments, and the national government establishes their obligation to coordinate and co-finance the development of municipality eGovernment services under the above-mentioned common major body.

Centralised Ad Hoc and Innovation Funds

One of the most successful examples of Ad Hoc Funds for eGovernment is represented by the Finnish "eEnablers" initiative. Central administration projects usually rely on the budgets of traditional ministries and agencies. In the 1999 fiscal year, however, the national Parliament approved a €37 million "future funds" incentive. These funds were specifically aimed at the provision of national "eEnablers", such as the Citizens Portal and the Electronic Forms Service⁷⁴. The 1999 initiative paved the way for an efficient development of the Finnish eGovernment infrastructure, so that, in recent times, the Information Society Council has suggested providing additional ad-hoc funds⁷⁵ in order to update and renew the eGovernment national offer.

As in the above-mentioned Finnish example, the Belgian government decided to finance the implementation of eGovernment projects by methods alternative to central budget allocations. In September 2000 a note from the Belgian Federal government addressed the issue of funding the national Information Society (and eGovernment) Plan. In particular, the Government decided to use resources deriving from the auction of UMTS licences⁷⁶. Funding from the auction sale was integrally destined to public debt reimbursement. A part of the financial resources made available by lower interest payments were employed for the financing of some of the Information Society plan initiatives. This amount was shared between the financing of Information Society and public sector mobility initiatives, with an initial proportion of one-third –

⁷³ "IT in Public Administration of Estonia. Yearbook 2004", Ministry of Economic Affairs and Communications, <http://www.riso.ee/en/pub/2004it/>, accessed September 2005.

⁷⁴: Organisation for Economic Co-operation and Development (OECD) (2003), *eGovernment in Finland*, *op. cit.*.

⁷⁵ See the "Coordination and Development of Online Services" Chapter in Information Society Council (2001), *Public Services in the New Millennium – Programme of Action to Promote Online Government*, Information Society Council, Helsinki, available at <http://egov.alentejodigital.pt/Finlandia/PublicServices.pdf>, accessed September 2005.

⁷⁶ See *Budget des Recettes et des Dépenses pour l'année budgétaire 2005*, approved by the Chamber of Representatives 29th October, 2004, available at <http://www.budgetfederal.be/f/h2/AlqToelFR2005.pdf>, accessed September 2005

two-thirds. This sharing is destined to be progressively inverted, arriving at a two-thirds – one-third ratio until 2005.

The Ad Hoc Funds approach also appeals to countries whose eGovernment implementation life cycle is just at the early stages: this funding mechanism, in fact, can also ensure resources for projects with a low Return On Investment, such as in the initial phases of an eGovernment programme. It is not surprising, therefore, that Slovenia is currently planning the selling of State-owned IT and TLC companies or assets, with the aim of collecting one-time resources to be reinvested in eGovernment cornerstone projects⁷⁷.

Private Sector involvement schemes

Following the previously cited Forrester Research Public-Private Partnerships taxonomy, the Austrian realisation of the "Help.gv.at" State portal can be considered a crystal-clear example of a benefit-funded gain sharing project⁷⁸. The "Help.gv.at" Public-Private Partnership, in fact, is based on the financial co-operation between the Federal Ministry of Finance and the "Post- und Telekom-Austria AG" (henceforth PTA), the main national company for phone and postal services. PTA's interest in the partnership is given by the opportunity to provide own services and products to the portal users, such as broadband connections, internet servers or consultancy services. The Ministry of Finance incurs the overall development costs, while PTA and a 100% PTA-controlled company, "Bundesrechenzentrum GmbH", sustains the current costs; additional resources are provided by ad-hoc sponsorships⁷⁹.

A similar example of Public-Private Partnership can be identified in Luxembourg, where the setting up of a Public Key Infrastructure (PKI), considered a fundamental component of the national eGovernment strategy in order to evolve from the "publish" to the "interact" phase, is in charge of an ad-hoc created Economic Interest Group (EIG). Founded in March 2003, the LuxTrust Group was created after the mandate given by the CNSI (Conseil National pour la Société de l'Information – National Council for the Information Society) to the Ministry of the Economy, to negotiate a partnership with the private sector⁸⁰. The EIG project was negotiated and then implemented with

⁷⁷ Source: Ministry of Information Society (2003), *Slovenia in the Information Society*, Ministry of Information Society, Ljubljana, available at [http://mid.gov.si/mid/mid.nsf/V/KACF73A1447CF53FEC1256DE50042087A/\\$file/Strategy%20RSIS_fi_nal_20030213.pdf](http://mid.gov.si/mid/mid.nsf/V/KACF73A1447CF53FEC1256DE50042087A/$file/Strategy%20RSIS_fi_nal_20030213.pdf), accessed September 2005.

⁷⁸ Panzig, H. (2000), *Gestaltung regionaler Informationssysteme - Thema: Verwaltung und Internet - 5. Phase: "One Stop Government"*, in *JurPC*, Web-Dok. 99/2000, Abs. 1 – 18, available at <http://www.jurpc.de/aufsatz/20000099.htm>, accessed September 2005.

⁷⁹ The "Wedding" section of the portal, for instance, also provides banners readdressed to private companies operating in the same sector.

⁸⁰ See http://www.eco.public.lu/attributions/dq3/d_communications/commerce_electronique/lux_pki/, accessed September 2005

a group of banks and the ABBL (Association of Banks and Bankers of Luxembourg⁸¹). The purpose of the Group's activity is⁸²:

- ❑ To prepare a business plan for a concrete offer, based on marketing studies of users' needs and possible applications
- ❑ To define the requirements in order to involve the private sector in the PKI implementation, adopting the best offer on the price/quality criterion
- ❑ To propose a middle-term financing plan and a tariff scheme consistent with different users' groups.

The total funding of the EIG is provided by public and private partners in equal parts⁸³. Since 2004, the total amount of public funding allocated to the PKI implementation was about €50,000, while the provisional budget for 2005 allocated €200,000⁸⁴.

3.3. Brief overview of the U.S. experience

With the aim of stimulating the use of ICT and of better managing its acquisition, the well-known Clinger-Cohen Act (often referred to as the Information Technology Management Reform Act) was enacted in 1996. This act required that department and major agencies nominate a "chief information officer" and repealed a previous law, which had established a highly centralized process for approving the acquisition of ICT, thus giving greater autonomy to departments and agencies. On the other hand, the act also imposed more demanding requirements for obtaining funds and entrusted the Office of Management and Budget (OMB) with the task of analysing, tracking, and evaluating all major capital investments for ICT. The OMB has moved accordingly, creating a database of ICT projects used during its annual review of budget proposals⁸⁵. The Clinger-Cohen Act also permits cross agency funding of projects 'a practice otherwise prohibited under most U.S. appropriations laws, which tend to require single agency funding and accountability for projects'⁸⁶.

⁸¹ See <http://www.abbl.lu/index.php>, accessed September 2005

⁸² See http://www.eco.public.lu/attributions/dq3/d_communications/commerce_electronique/lux_pki/, accessed September 2005

⁸³ See http://www.gouvernement.lu/salle_presse/actualite/2003/03/04grethen/, accessed September 2005

⁸⁴ Court des Comptes du Grand-Duché de Luxembourg (Court of Audit of the Grand-Duchy of Luxembourg), *Rapport Spécial - Contrôle du Programme eGovernment*, 2005, available at http://www.cour-des-comptes.lu/rapports/rapports_speciaux/eGovernment.pdf, accessed September 2005

⁸⁵ For an overview of such OMB activities see *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2006*, U.S. Government Printing Office Washington, 2005, Section 9 "Integrating Services with Information Technology", pp. 173-179. (<http://www.whitehouse.gov/omb/budget/fy2006/pdf/spec.pdf>)

⁸⁶ Reeder, *op. cit.*, p. 27.

Despite such changes, however, eGovernment initiatives in the US have been mainly funded through the vertical approach and have received relatively modest funding compared to the overall IT budget for the federal government.

The US Federal budget for the 2006 fiscal year as presented in 2005, for instance, proposes to spend \$65 billion for Information Technology and associated support services 'to deliver results to the American people, providing timely and accurate information to the citizens and government decision makers while ensuring security and privacy'⁸⁷. This represents a 9% increase over the budget planned in 2004 for 2005 (\$59.6 billion)⁸⁸. This growth rate is in line with the gradual increases registered in the previous years of the Bush Administration: the budget for 2003 (\$52 billion) represented a 6% increase over 2002(\$49 billion)⁸⁹, that of 2004 (\$55.6 billion) was an increase of 6.9% over 2003, and finally that of 2005 (\$59.6 billion) a 7.1% increase over 2004.

While the Section on Information Technology of the report Analytical Perspectives, Budget of the United States Government, Fiscal Year 2006 cites eGovernment widely and has a paragraph dedicated to it⁹⁰, it mostly discusses the benefits produced by various eGovernment projects but does not mention any ad hoc fund or part of the budget appropriation specifically earmarked for eGovernment.

Table 4 US Government IT Budget and eGovernment Expenditure (\$ billion)

	2002	2003	2004	2005
US Government IT Budget	49.0	52.0	55,6	59.6
US Government eGovernment Expenditure	2.6	3.6	4.8	6.5
eGovernment Expenditure as % of IT Budget	5.3%	6.9%	8.6%	10.9%

Sources: a) for IT Budget: Analytical Perspectives, op. cit., and Reeder, op.cit.; b) for eGovernment Expenditure eMarketer Estimates

While the comparison in the table above, between planned budget for IT and actual eGovernment Expenditure as estimated by a market research company, must be taken cautiously given the evident limits of reliability and comparability of the data used, it nonetheless provides a preliminary indication of how eGovernment expenditure, while growing at much faster rates (a yearly average of 35% growth as opposed to about 6.6% of IT budget), is still a small proportion of the IT budget.

This context partially explains why federal, state and local agencies in the US have been very active in searching and launching partnerships with private partners.

⁸⁷ Analytical Perspectives, op. cit., p. 173.

⁸⁸ Ibid., p. 174.

⁸⁹ Reeder, op. cit., p. 22.

⁹⁰ Analytical Perspectives, op. cit., pp. 177-178.

According to Forrester Research, tight budgets and staffing challenges `have prompted government leaders and private-sector partners to look for innovative solutions to gain some forward momentum⁹¹. Forrest analysts explain how `state government coffers are at historic lows, and federal non-defence, non-homeland-security domestic discretionary spending is declining⁹², while at the same time watchdogs, such as the OMB, impose increasingly demanding requirements for funding justification and for subsequent monitoring of resources. The tight budget dimension is an incentive for both government agencies and private companies that want/must do business with government. On the other hand the staffing challenge mainly touches government agencies. The sharp salary gap existing in the US between the public and private sector limits government managers in attracting and retaining skilled personnel and increases their dependence on private service providers.

These and other factors partially explain the flurries of gain sharing PPP launched in the US, both by federal and state level agencies. Five US states (California, Hawaii, Kansas, Missouri, and Virginia), for instance, have partnered with CGI-AMS on developing digital tax systems on the basis of a benefit-funded gain sharing agreement. While at the Federal level, the Department of Energy (DOE), the Department of Education, and the Environmental Protection Agency (EPA) have all implemented shared savings projects.

A quintessential example of an extensive PPP driven not only by a gain sharing agreement is the I-Team initiative, linking federal and local public agencies with communities and private partners and led by the U.S. Office of Management Budget (OMB) in the field of National Spatial Data Infrastructure (NSDI)⁹³. The I-Team Initiative addresses institutional and financial barriers to development of the NSDI with the aim of harnessing geo-spatial data into information for citizen, consumer, business and government decisions requiring vision at the technical, organizational and financial levels. It aims to create a coherent set of institutional and financial incentives that will facilitate collaboration between all levels of government and the private sector when building the next generation of framework data. By aligning

⁹¹ Leganza, *op. cit.*, p. 2.

⁹² *Ibid.*

⁹³ For the basic founding features and fact of the I-TEAM initiatives see a) OMB, Implementing a New paradigm, (<http://govinfo.library.unt.edu/npr/initiati/ombpaper.pdf>); b) U.S. Federal Geographic Data Committee, I-Team: Overview (http://www.fgdc.gov/fgdc/steer/i_team.doc); c) U.S. Federal Geographic Data Committee, Financing the NSDI: National Spatial Data Infrastructure, February 10, 2000(http://www.fgdc.gov/funding/urbanlogic_exsum.pdf); d) B. Cahan, "The I-Team Initiative: Innovating Organizational and Financial Infrastructure for the NSDI (the United States National Spatial Data Infrastructure)", paper presented at The fifth annual Global Spatial Data. Infrastructure (GSDI) conference, Cartagena, Columbia, May 2001 (<http://gsdidocs.org/gsdiconf/GSDI-5/papers/Bruce%20Cahan-FGDC.pdf>); e) B. Cahan, "Public-Private Partnership: The US Experience", presentation delivered at at the OECD e-Government Project Seminar – Strategic E-Government Implementation, Paris June 20-21, 2002.

participant needs and resources, the I-Team Initiative will focus on helping all levels of government and the private sector to save money, make better use of existing resources, and develop the business case for public and private resources necessary for spatial and infrastructure activities. The Federal Geographic Data Commission (FGDC) had, for a long time, focused on NSDI common principles, technical standards, clearinghouse networks and partnerships needed to enable governments, businesses and the public to use spatial data most effectively. The FGDC did not, however, have available a mechanism to provide the financial and institutional incentives necessary to induce Federal, State and local authorities to collaborate fully. The I-Team process seeks to provide those incentives. The I-Team Initiative relies on locally formed interdependent partnerships of Federal, State, local, and tribal authorities, academia, and the private sector (I-Teams) to steward implementation of State and regional portions of the NSDI as part of their ordinary business processes in accordance with interoperability specifications and data standards. I-Teams are voluntary, open, flexible and adaptive collaborations for sharing capital planning, building, use and financing of spatial data. They align and optimise interdependencies, helping standards and interoperable specifications arising by consensus from I-Teams for use in establishing national or international guidelines.

While the basic concept behind PPP are gain-sharing projects, their implementation requires flexibility and complex contracts that represent radical changes with respect to well-established public procurement practices. Therefore the recent development of PPP and gain sharing agreements have only partially been the result of bottom-up spontaneous development, as they had to be supported by legislation and regulation introduced at the federal level. For instance the mere possibility that a government agency pull the plug before any gain has been achieved would scare off any private-sector partner.

The federal government dealt with and regulated the termination issue in the 2002 eGovernment Act (reducing termination funding requirements) and put GSA in charge of assisting federal agencies in pursuing these types of engagements⁹⁴. In addition to simplifying the initial procurement steps for gain-sharing projects, GSA has created blanket purchase agreements for six service providers, which can each sign up for \$500 million in projects (Accenture, CGI-AMS, Computer Sciences Corporation (CSC), IBM, Science Applications International Corporation (SAIC), and SRA International). GSA has also provided general performance-based acquisition guidance, a business case decision tool, a proposal evaluation tool, and external training classes, and it has proposed a Federal Acquisition Regulation (FAR rule), to support federal agencies' pursuit of gain-sharing (5)⁹⁵.

⁹⁴ Leganza, *op. cit.*, p. 5.

⁹⁵ For an illustration of all the elements enabling gain sharing projects (evaluation tool, blanket purchase agreement, relevant supporting legislation including sections of the eGovernment Act, etc) See

3.4. Preliminary Assessment and Forward Looking Considerations

There are no doubts that government transformation requires a culture of continuous and sustainable innovation rather than one of one-time or sporadic innovation⁹⁶. While the cultural shift is paramount, nonetheless the sustainability of this approach of continuous innovation depends also on adequate financing. eGovernment is at the forefront of government modernisation, especially the second generation of transformative projects requiring basic horizontal infrastructure and back-office reorganisation. These are multi-annual projects requiring flexible and farsighted financing. While accountants may still claim that capital is only physical, it is our view that the financing of eGovernment projects and ICT systems supporting them is a question of capital budgeting as they produce benefits well beyond the period for which they are financed.

Additionally to the transformative and multi-annual dimensions, eGovernment projects are widely recognised as having inherent potential for horizontal and cross-cutting usage of input and delivery of benefits. Therefore their three attributes are: a) transformative; b) multi-annual; c) potentially horizontal and cross-cutting. These attributes inform the considerations below, together with the clear fact that government budgets are increasingly tight, while demands towards the public administration for better services and efficiency gains is rising.

There is no doubt that **Vertical Funding** is in line with the traditional public sector approach towards accountability and control and, by requiring eGovernment investments to compete against other claims for investments, sharpens the discussion of the business case. Another characteristic is that vertical funding through government budgeting has an annual or at most biennial time focus. While these are important elements that help designing budgets and managing the overwhelming complexity of government, they have two major drawbacks with respect to eGovernment:

1. They make it difficult to finance projects that benefit more than one agency or program and forego the opportunities for leveraging the power and costs of IT infrastructures across government levels. Unless the benefits overwhelmingly accrue to a single ministry or department that is willing to make the investment, such cross-cutting projects are not likely to be funded through the Vertical model;
2. They do not promote innovative and transformative projects requiring a multi-annual time horizon. Opportunities enabled through the effective use of IT require a different time horizon to promote value-creation through IT projects

<http://www.gsa.gov/Portal/gsa/ep/channelView.do?pageTypeId=8203&channelId=-13079> , accessed September 2005.

⁹⁶ Light, P., *Sustaining Innovation: Creating Nonprofit and Government Organizations that Innovate Naturally*, Jossey-Bass, San Francisco, 1998.

requiring multi-annual support to develop, maintain, and improve systems used for electronic government services.

Horizontal funding addresses in part these deficiencies in vertical funding (especially the former, but not necessarily the latter) by encouraging the pooling of resources, while at the same time retaining the requirement for eGovernment investments to compete against other priorities within a program. The drawback of this approach is that it may result in a less tight control in the usage of resources as compared to vertical funding or in a gradual decrease of cooperation. If the horizontal project funding and management is equally shared among the participating agencies, this may result in lack of control on the side of the selected lead agency or of the entrusted watchdog. On the other hand, if control and funds are shifted to the lead agency this may decrease the actual interest and participation of the other agencies. An additional critique for large size and multi-annual public funding of horizontal projects is that they are ***mortgaging the future*** in a context of shrinking public budgets.

Ad Hoc Central Funding has the advantage of providing an assured source of financing for high priority and infrastructure investments and for innovative projects and allows a central authority to set and implement priorities for eGovernment, at least to the extent of the resources allocated to the central fund. The critique to central funding are several. First, given that the total available resources for government spending are limited, central funds are in effect a tax on other spending authorities. Second, when this is not the case as the money comes from one-time revenues (i.e. UMTS auction funds or money from the sale of state enterprises), the spot nature of such funding lays doubts on the future sustainability of the financed projects. Third, centralised funds run the risk of resulting in a technology push not always reflecting the real demands and need of the public. Finally, when they are of considerable size and multi-annual, centralised funds are also subject to the argument of ***mortgaging the future***.

Gains Sharing and more extensive **PPP** can have important potential benefit, especially as they reduce the burden on public budgets while potentially improving the quality of the services provided by public administrations and the efficiency gain. First, in the case of successful results such as those achieved in the above-mentioned example of the Californian Franchise tax Board, the ***mortgaging the future*** effect can be mitigated. Second, if well designed, such projects can produce quick gains. Third, as a result of cooperation with various partners and the bringing together of skilled staff from different backgrounds, projects have the potential to achieve transformational and lasting changes within public administrations. On the other hand, these approaches, more than the drawbacks, present some difficulties and technical requirements for their development (see exhibit below). First, in order to attract private partners and to draft fair contracts, public agencies must present ***measurable baselines*** and a ***clear view of operating costs*** in order to define the benefits or

saving objectives of the gain sharing agreement. Second, as shown from the US case, the needed legislation and regulation must be in place and a framework of guidelines and tools is needed to ensure the strategic control and management of such a project, as well as to ensure the required public accountability and reassure public opinion that no undue private appropriation of public assets and funds is surreptitiously taking place. Third, not all eGovernment projects can produce hard measured benefits and/or savings and the excessive reliance on the gain sharing model may result in under-funding of certain segments of projects. Finally, there is a number of cultural-organisational and political resistance to overcome. Procurement officers' attitudes towards an established public procurement regime can be an obstacle, as well as the attitudes of public managers that prefer traditional methods enabling full control and retaining the possibility of pulling the plug. Political resistance at the higher level may arise for well entrenched mistrust in private sector involvement in the provision of public services.

Exhibit 6: Forrester Research PPP favourable and unfavourable attributes

Favorable attributes	Unfavorable attributes
<ul style="list-style-type: none"> • Limited available project funds • Discrete net new revenue assured • Significant expected benefits • Inclusion of process re-engineering • Measurable baseline • Measurable savings • Clear operating costs 	<ul style="list-style-type: none"> • Soft savings, such as cost avoidance • Savings due to staff elimination • Unreliable baseline metrics • Arbitrary definition of savings • Savings from support cost reductions with unclear service levels • Project scope misaligned with baseline

Source: Forrester Research (Leganza, op. cit., p. 7)

As seen, all of the above financing models have advantages and disadvantages and it is probably wise to propose a 'portfolio funding approach' selecting from all the possible funding options reviewed in view of project requirements and policy priorities both at the micro level of agency autonomous search for funding⁹⁷ and at the macro level of government funding policy and supporting legislation.

Having said that, in light of the characteristics of the eGovernment projects needed to modernise public administration (transformative, horizontal and multi-annual) and of the tight budget constraints, it is our view that resorting to collaboration with private partners in projects involving several public organisations together with other civil society players (communities, NGOs, professional and industry associations, etc) **is not a tactical choice for one-time 'saving of government buck' but must become a strategic direction in the development, financing and managing of**

⁹⁷ See in this respect the interesting portfolio funding strategy adopted by the Florida Association of Court Clerks and Comptroller (FACC) for implementing eGovernment solutions providing both the public and practitioners timely access online to courts documentation and proceeding as reported in L. Scardino, *Innovative Government Funding Model*, Gartner, Research Note, 10 September 2001 ([http://www.flclerks.com/Pub_info/2000_2001_pub_info/Innovative Govt Funding.pdf](http://www.flclerks.com/Pub_info/2000_2001_pub_info/Innovative_Govt_Funding.pdf))

eGovernment. In this respect such a strategic drive will be an eGovernment contribution to the shift from traditional **hierarchical Government** to **networked Governance**, which has been already discussed and heralded for many years but has not yet been realised. If this shift occurs, and funding has a crucial role in bringing it about, then eGovernment could be truly seen in the broadest sense of an ICT supported reconfiguration of public sector governance.

Naturally this is a challenging, difficult, and potentially risky change requiring, not simply a cultural shift and political leadership and commitment at all levels of government, but also new management capabilities and tools especially for strategic planning and control.

Networked governance, in which the public actor, at all levels, should decrease its 'rowing' role and empower its 'steering' capacity, implies a distributed regime of responsibility, knowledge, power, and purpose. The risk of this model is that at times accountability can be blurred, a possibility that must be countered by governments which will still have to be accountable to tax payers and voters.

In the case, for instance, of eGovernment projects implemented in partnership with private companies it is fundamental, both for launching them and for subsequent monitoring of results, to have measurable baselines of costs and instruments to measure and assess outcomes in terms of achieved benefits or savings.

Therefore, we can conclude that the object of eGEP work, namely the measurement of impacts and the methodology to identify the costs of eGovernment, are important for the development of new and innovative funding models and can thus provide public administrations with the tools supporting the shift to networked governance.

4. Expenditure Assessment

In this section we present the main synthetic findings of the work carried out to produce the quantitative assessment of expenditure. These final results rest on a very considerable amount of background work reported in full in the *Expenditure Study Compendium*⁹⁸. In paragraph 4.3 of this section we synthetically report aggregate expenditure data, whereas country specific data are also to be found in the *Expenditure Study Compendium*⁹⁹

4.1. Premise

Unit of Analysis. The data presented concerns General Public Administration (at national, regional and local levels) and thus only represents a subset of the public sector as a whole. It excludes vertical spending on health, education, defence, etc.

Definition of eGovernment expenditure. The basic challenge concerns how to derive an operational definition of **eGovernment Expenditure**, reflecting the broader definition of eGovernment presented in the 2003 EU Commission Communication to which eGEP subscribes¹⁰⁰, in such a way that it allows one to distinguish specific eGovernment expenditure from more general ICT expenditure. While we have proposed our own operational definition and included in the 'how to paper' distributed together with eGEP questionnaire¹⁰¹, the data and/or estimates provided by our contact points in Member States was shaped by pre-existing national data classification and reporting practices. Only a detailed information on all ICT related projects funded in a given year would have allowed one to produce a figure on eGovernment Expenditure strictly reflecting our operational definition. This has been

⁹⁸ Section 4 of the *Expenditure Study Compendium* contains a full discussion of the data gathering problems encountered and of their causes, the illustration of the methodology employed in estimating the data that was not obtained through the questionnaire or through secondary sources, the short 'how to paper' that integrated the eGEP Expenditure questionnaire, and the questionnaire itself.

⁹⁹ Section 5

¹⁰⁰ "The use of ICT combined with organisational change and new skills in order to improve public services, democratic processes and public policies. This is what eGovernment is about" (*op. cit.*, p. 4)

¹⁰¹ eGEP definition of eGovernment Expenditure is operationalised as to include "all the set up, provision, and maintenance costs incurred to put in place the technological, organisational and training solutions that directly (through front-end solutions) or indirectly (through back office reorganisation, optimisation of supporting database and workflow applications, horizontal authentication and security infrastructure projects , etc) make the provision of the 20 basic eGovernment services defined by eEurope 2005 possible".

possible only for the Italian case, since CNIPA produces a thorough and detailed annual report listing all projects financed with the amount spent and the description of the project¹⁰². On the other hand, our operational definition has shaped the estimation adjustment made on the quantification of eGovernment Expenditure data ensuring comparability.

Questionnaire return. At the end of an activity started in April and continued until mid November¹⁰³, only 6 Member States were unable to return our questionnaire. For two of them, however, we were able to find some official data independently through desk research. Therefore, for only 4 Member States is the data presented in paragraphs 4.3 entirely based on our estimation methodology¹⁰⁴.

Main challenges for data gathering. The questionnaires returned from Member States in several cases contained only some of the data we requested (data returned only on ICT but not on eGovernment and/or lack of the breakdown of the expenditure data into their basic components). This fact is indicative of a number of problems¹⁰⁵ inferred from interviews with Member State representatives and with experts from industry and international organisations, which we list without implying any order of priority:

1. **Organisational capabilities.** Current accounting practices are not yet granular enough in terms of coverage, precision, and breakdown in the recording of costs¹⁰⁶. In addition, recorded data is scattered across the public administration system and in most cases no central institution is in charge of gathering and standardising this data.
2. **Conceptual ambiguities.** The lack of a robust operational definition delimiting what is eGovernment Expenditure is an important factor. This was also cited by market research experts interviewed, who affirmed they rather quantify general ICT expenditure than eGovernment expenditure precisely due to a lack of a commonly agreed operational definitions of the latter¹⁰⁷.
3. **Cyclical nature of eGovernment expenditure.** As illustrated in par. 3.1 on financing, while ICT generally has an established place in budget allocation

¹⁰² See discussion of such data at the beginning of para. 3.1 (referenced in footnote 53)

¹⁰³ Entailing repeated mailing and several round of phone calls.

¹⁰⁴ The six countries that did not return eGEP questionnaire were: Denmark, Estonia, Greece, Ireland, Latvia, and Portugal. For Estonia and Greece we were able to find official data through secondary sources search. Therefore only for four countries (Denmark, Ireland, Latvia, and Portugal) the data presented have been entirely estimated.

¹⁰⁵ Documented in more details in par. 4.1 of *Expenditure Study Compendium*.

¹⁰⁶ First, ICT items escape the accounting systems as they are often recorded together with other types of expenditure. Second, when they are recorded they do not possess the necessary precision and granularity to be broken down into their main components (hardware, software, services, etc).

¹⁰⁷ It is indicative of this state of affairs that most respondents to our questionnaire subscribed to the broad EU Commission definition of eGovernment, but then estimated that currently eGovernment expenditure amounts to no more than 25% of total ICT expenditure by public administrations.

practices, financing for eGovernment is less structured and tends to be cyclical. It is thus difficult to quantify and segment an expenditure aggregate whose size changes considerably every year and whose definition may differ from one country to another¹⁰⁸.

Solutions adopted. To cope with challenges in term of missing data we have devised an estimation and data adjustment methodology¹⁰⁹ and we have prolonged and deepened our desk research, thus enabling us to find some publicly available data. Finally, in order to have a benchmark for performing a reality check on the data produced, we purchased the **Kable** report *ICT spend in the European public sector to 2007*¹¹⁰.

We followed the guiding principle to present, wherever possible, the exact figures provided to us by Member States. As far as eGovernment expenditure is concerned, however, we made some adjustments to reflect our operational definition or for comparability reasons¹¹¹. In devising our estimation and adjustment methodology we strived for simplicity and transparency, while ensuring reliability. The basic and simple principle of the methodology has been to infer the lacking data by using a number of contextual and supporting estimation variables either in a more simple 'within country' perspective¹¹² or in a slightly more complex 'between country perspective' that required to group countries into clusters. In our clusterisation, after very sophisticated multi-variable techniques yielding counter-intuitive results, we opted for simplicity.

4.2. Contextual Data and Clusters

By way of introducing the general context within which our figures must be read, in this paragraph we summarise some insights on the ICT market as a whole presented in the latest edition of the European Information Technology Observatory (EITO),

¹⁰⁸ Again market research experts claimed that longer time series available on general ICT expenditure and its more steady supporting financing mechanisms enable a much better and reliable quantification and breakdown than is possible for eGovernment.

¹⁰⁹ Documented in details in par. 4.2 of *Expenditure Study Compendium*.

¹¹⁰ This report contains data only on ICT expenditure and does not address eGovernment expenditure and the data reported is for fiscal years defined across two years, whereas the data we received from Member States concern consolidated data for 2004 only. Despite these differences, we still considered it useful to compare the data we gathered for 2004 with those provided by **Kable** for 2004-2005.

¹¹¹ Just to provide an example, the UK contact point has told us in writing that they do not distinguish between ICT expenditure and eGovernment expenditure, but simply talk about 'IT Enabled Government'. This would imply the UK figure for eGovernment expenditure would be exactly equal to the figure for ICT Expenditure. If we were to use that figure, it would produce comparability problems with most other Member States, which have either reported eGovernment figures that amount at most to 30% of ICT expenditure (in some cases the figure is as low as 10% of ICT expenditure) or estimated it as no more than 25% of ICT expenditure. Accordingly for the UK case we adjusted the figure for the sake of comparability.

¹¹² For instance where it was not possible to obtain data on regional and/or local level, the data was estimated using the proportion between public spending as a whole between the various tier of public administration.

integrated with some preliminary considerations on the public sectors derived from EITO, but also from market research, press releases.

Table 5: Western Europe¹¹³ ICT Market Break Down

	Value (€ billion)	% of total
Total ICT equipment ¹¹⁴	145	24.4
Software ¹¹⁵	65	11.0
IT Services ¹¹⁶	124	20.8
Carrier Services	261	43.9
Total	594	100.0

Source: Elaboration on European Information Technology Observatory, 2005, p. 38

Table 5 above from EITO provides an overall picture of the ICT spending size where the unit of analysis is the entire market, thus including both broadly defined business (private sectors and public sector) and consumer expenditure. This explains the large size of the "carrier services" item which include fixed and mobile traffic of which the consumer share is large, as well as the item "end-user communication equipment" (included in table 5 in the item "total ICT equipment") representing the expenditure of handset (of which, again, a large share is represented by the consumer market).

Table 6: Western Europe IT Market Break Down¹¹⁷

	Value (€ billion)	% of total
Broadly defined hardware ¹¹⁸	88	30.9
Office equipment ¹¹⁹	9	3.2
Software	65	22.8
IT Services	123	43.1
Total	286	100.0

Source: Elaboration on European Information Technology Observatory, 2005, p. 219

Table 6, limited to the IT market, provides a picture that is probably less affected by final consumer spending than the aggregate ICT market size presented in the previous table. In this case the break down into the various expenditure components is more interesting from our point of view. It is worth pointing out that, while software and hardware account for 53.8% of the total IT market in Western Europe, IT services (including consulting, implementation, operation management, etc) account for the considerable amount of €123 billion and with 43.1% of the total market, is the single highest item in terms of share.

¹¹³ Western Europe includes EU15 plus Switzerland and Norway.

¹¹⁴ Including: a) computer hardware; b) end-users communication equipment; c) office equipment ; d) datacom and network equipment

¹¹⁵ Including: a) system software; b) application software

¹¹⁶ Including: a) consulting; b) implementation; c) operation management d) support services.

¹¹⁷ Rounded figures.

¹¹⁸ It includes, with typical computer hardware, communication related hardware such Lan Hardware, packet switching and routing equipment, for a total of about €14.7 billion.

¹¹⁹ Including: a) copiers; b) other office equipment.

Table 7: Western Europe IT and TLC Market Growth Rates

	2004/03	2005/04	2006/05
IT Market	2.7%	4.3%	4.3%
TLC Market	3.3%	3.3%	3.1%

Source: European Information Technology Observatory, 2005, p. 40

Table 7 above reports quite modest rates of growth for both the IT and TLC market as a whole. While the EITO 2005 edition does not report any separate data on the public sector, in its mostly qualitative analysis of ICT adoption by industry, it affirms that 'the public sector will continue to offer the best short-term growth opportunities' and suggests a growth rate of about 5% a year¹²⁰. A similar estimate, though limited only to IT expenditure, was released in July of 2005 by market research company IDC¹²¹. According to IDC, the average growth rate of government IT spending (5.3%) will continue to stay above the IT market average throughout the 2004-2009 period, with local government representing the strongest driver (IDC estimates local authorities IT spending growth rate at 5.8%, compared to 4.8% for central government).

Returning to the local dimension of spending, it is worth pointing out that, according to market research company Datamonitor, the local authority drives for ICT spending is strongest in the UK compared to the other two large European markets represented by Germany and France¹²². In this respect, from the data obtained from our questionnaire, we can also add that at local level ICT, expenditure is more strongly correlated to eGovernment projects than at the national level. This trend was confirmed to us during interviews with market research experts who explain this as a result of the advantage of being a late comer: local authorities can now buy ERP solutions including web portal and service components, thus combining, in one stage, what most central level agencies have done step-wise.

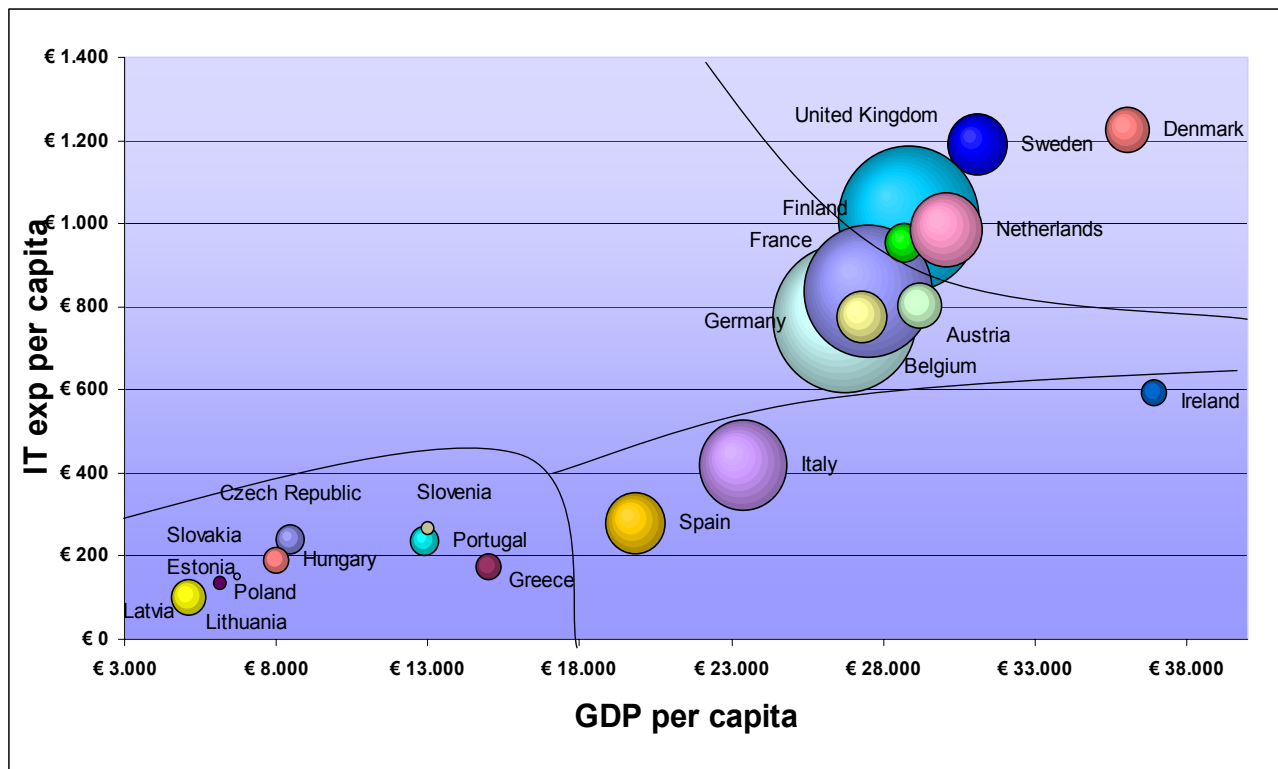
Finally, and going back to the aggregate market data reported in EITO 2005, in Exhibit 7 below, complementing such data with Eurostat figures on total population and GDP, we present a simplified clusterisation of the 25 EU Member States.

¹²⁰ European Information Technology Observatory, 2005, p. 61.

¹²¹ Reported in *eGovernment News - 12 August 2005 - EU & Europe-wide* (<http://europa.eu.int/idabc/en/document/4556/330>)

¹²² Reported in *eGovernment News - 24 February 2005 - EU & Europe-wide* (<http://europa.eu.int/idabc/en/document/3928/336>).

Exhibit 7: EU22¹²³ IT Expenditure per capita (vertical axis) GDP per capita (horizontal axis) and total IT Expenditure (bubble dimension) in 2004



Source: EITO 2005 (IT expenditure) and Eurostat Portal (GDP and population data).

We used total IT expenditure rather than ICT in order to avoid the bias that would be produced for certain countries by including the TLC expenditure and particular the mobile traffic. There are, in fact, well known cases (Southern Europe and also some of the new EU members) where the penetration of mobile telephones is at the highest level, whereas the penetration of IT lags behind. Therefore we considered IT expenditure as a better variable for our purposes.

The clusters thus obtained, and clearly delimited in exhibit above by the curved lines, are quite meaningful and has been checked with other variables that mostly support it (see more in Expenditure Study Compendium, pp. 87-89).

The first cluster in the bottom left end-side of the exhibit (Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Slovakia, Slovenia) is mostly composed of New Member States, together with Portugal and Greece. Low levels of IT expenditure and of GDP per capita is in part compensated by the dimension of the overall expenditure (the bubble size), that, in some cases (see,

¹²³ EITO 2005 does not report data on Cyprus, Luxembourg and Malta which is not included in the clusters. This, however, does not represent a problem since for all three countries, expenditure data was obtained through eGEP questionnaire and no estimation was required.

for example, Poland, Portugal, Czech Republic) reaches the same dimension as more digitally advanced countries.

In the second group (Ireland, Italy and Spain), the position of Ireland can be explained by its fast growth during the last years. The dramatic increase in GDP and GDP per capita has not been followed by a comparable rapid intensification of IT expenditure, that, in fact, still lags behind in comparison with levels registered in countries with analogous GDP per capita.

The third (Austria, Belgium, France and Germany) and fourth (Denmark, Finland, Luxembourg, Netherlands, Sweden, and United Kingdom) groups are composed of the most advanced countries, registering higher levels in Information Society indicators. Countries in the fourth group are the most advanced ones in terms of IT expenditure per capita (above the € 1,000 threshold).

4.3. Expenditure Assessment

In this paragraph, we finally present the main aggregate results of the quantitative assessment of ICT and eGovernment expenditure for Total Public Administration (national, regional and local) as defined earlier in paragraph 4.1. In this latter paragraph the definition of the components of the expenditure is also provided (hardware, software, services, etc).

4.3.1. Benchmark: EITO 2002 Data

As anticipated earlier, the only publicly available data on public administration ICT and eGovernment expenditure in Europe are those presented in the EITO 2002 edition, which contained a monographic section on eGovernment¹²⁴. We briefly report below the data from this source in tables and graphs for the purpose of having a benchmark to compare eGEP assessment. EITO 2002 data refers only to the EU15.

Table 8: EU15 Total Public Administration (central, regional and local) ICT expenditure, 2000-2002 (million €)

	2000	2001	2002
Austria	€ 760	€ 785	€ 812
Belgium	€ 776	€ 857	€ 946
Denmark	€ 887	€ 944	€ 1,005
Finland	€ 584	€ 641	€ 706
France	€ 5,067	€ 5,136	€ 5,208
Germany	€ 5,400	€ 5,494	€ 5,597
Greece	€ 261	€ 275	€ 288
Ireland	€ 226	€ 241	€ 252
Italy	€ 2,596	€ 2,817	€ 2,873
Luxembourg	€ 58	€ 63	€ 67
Netherlands	€ 1,458	€ 1,499	€ 1,549
Portugal	€ 219	€ 290	€ 370

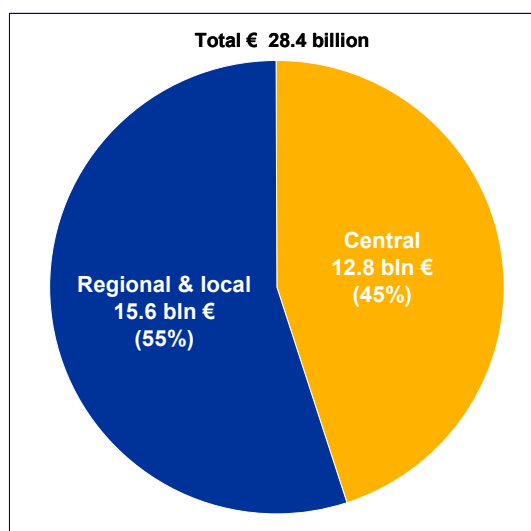
¹²⁴ European Information Technology Observatory, 2002, pp. 286-353.

Spain	€ 1,759	€ 1,896	€ 1,934
Sweden	€ 1,422	€ 1,438	€ 1,471
United Kingdom	€ 5,792	€ 6,033	€ 6,228
Total	€ 27,265	€ 28,409	€ 29,306

Source: EITO 2002, p. 299.

According to EITO 2002 figures (see table above), on average, over the period 2000-2002 in the EU15, total public administration ICT expenditure grew by 3.7% per annum, reaching about €30 billion in 2002. The following four exhibits report all the other relevant data contained in EITO 2002. First, the total breakdown between central public administration ICT expenditure on the one hand, and local and regional ICT expenditure on the other, is 45% to 55% (Exhibit 8)¹²⁵. Second, the breakdown into expenditure components including ICT Staff shows that, if we sum the technological components (software, hardware and communication) they amount to 48.5% of the total, while services plus the cost of internal ICT staff add up to 51.1% (Exhibit 9). On the other hand if we look at the components breakdown removing the cost of ICT Staff, we have the technology side adding up to 64.1% compared to 35.9% for services (Exhibit 10), which is the best proxy for the organisational intangible dimension of the expenditure. Finally, Exhibit 11 reports the aggregate estimates presented in EITO 2002 as regards the size of eGovernment and its share of total Public Administration ICT expenditure. In 2001 eGovernment is estimated at €5.2 billion (18% of total ICT expenditure) and in 2002 at €6.6 billion (22% of total ICT expenditure).

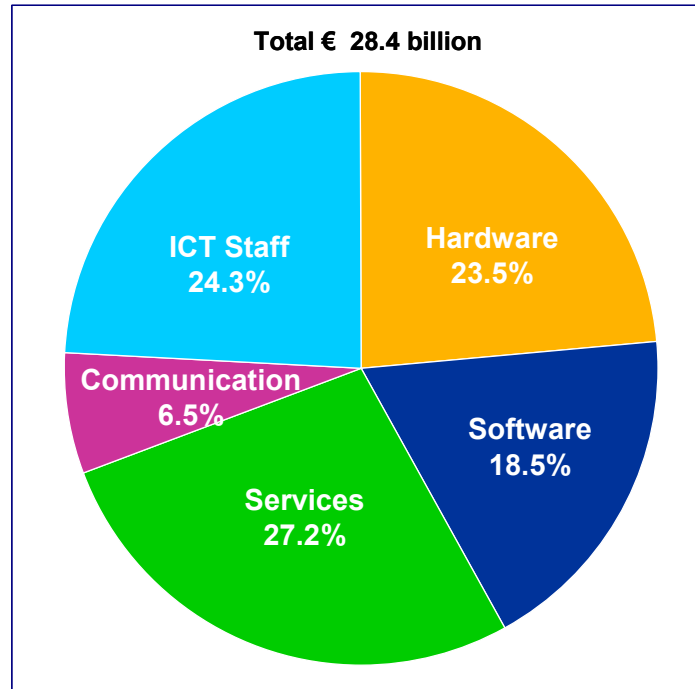
Exhibit 8: EU15 Total Public Administration ICT expenditure breakdown by administrative layer, 2001



Source: eGEP elaboration on EITO 2002, p. 298.

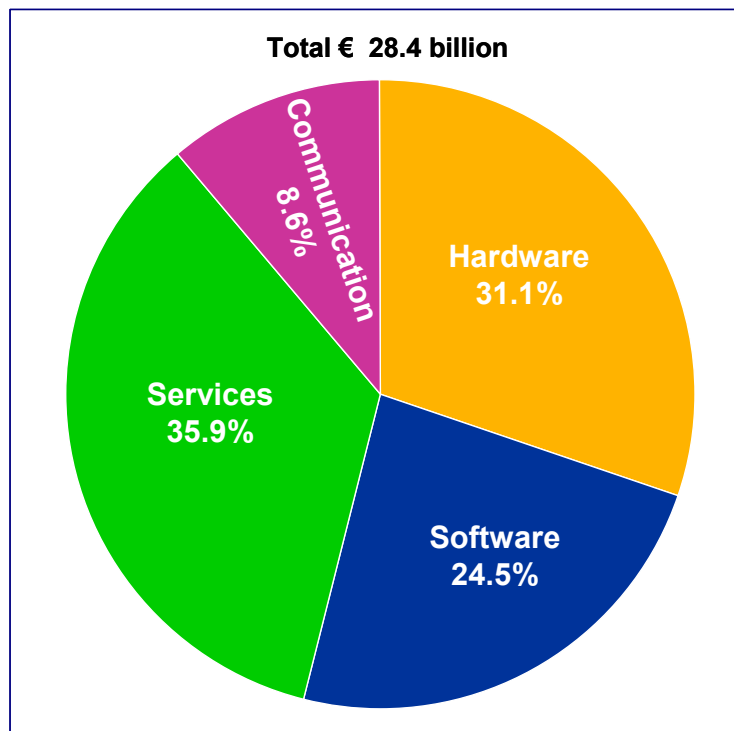
¹²⁵ No detailed country data on the break-down by administrative layer is reported in EITO 2002.

Exhibit 9: EU15 Total Public Administration ICT expenditure breakdown by components, 2001



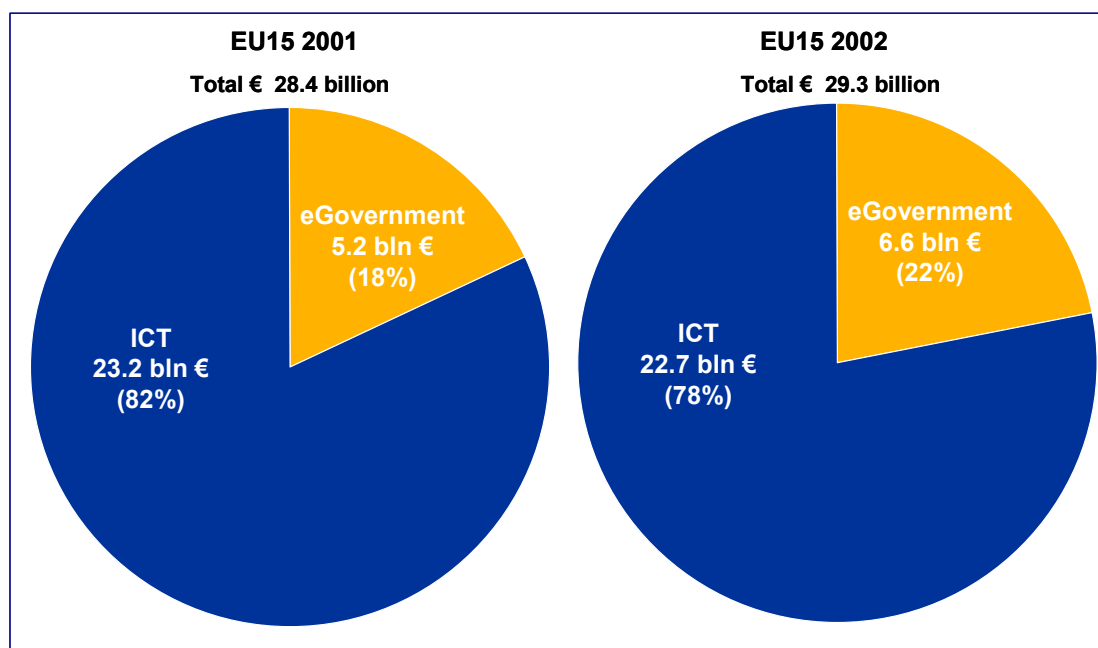
Source: eGEP elaboration on EITO 2002, p. 302.

Exhibit 10: EU15 ICT expenditure breakdown by components (excluding ICT Staff), 2001



Source: eGEP elaboration on EITO 2002, p. 302.

Exhibit 11: EU15 eGovernment as a % of ICT expenditure 2001 and 2002



Source: eGEP elaboration on EITO 2002, p. 286.

EITO 2002 does not report any other detailed breakdown for eGovernment expenditure and it must be stressed that such a figure has been estimated using a restrictive definition of eGovernment limited to the front-end dimension.

4.3.2. eGEP ICT Expenditure Assessment

We now present eGEP assessment of total Public Administration ICT and eGovernment expenditure for the EU25. Obviously, comparative considerations with respect to the EITO figures presented in the previous paragraph will apply only for the EU15. Below, the basic data is illustrated in tables and graphs. It must be noted that the amount of data obtained from the questionnaire regarding ICT expenditure is considerably higher when compared to eGovernment expenditure. Therefore, the latter has entailed a larger degree of inferential estimation than the former. In this respect we believe that the 'term' assessment aptly reflects the nature of the data presented for eGovernment expenditure.

As shown in table 9 below, our assessment of total Public Administration ICT expenditure in the EU25 is set at about €36.5 billion.

Table 9: EU25 Total Public Administration (central, regional and local) ICT expenditure in 2004

Country	Expenditure (Million €)
Austria	737.80
Belgium	724.40
Cyprus	28.10
Czech Republic	457.00
Denmark	1255.44
Estonia	28.50
Finland	983.36
France	5175.90
Germany	5964.50
Greece	295.88
Hungary	441.39
Ireland	255.75
Italy	3882.60
Latvia	30.36
Lithuania	59.25
Luxembourg	80.70
Malta	18.20
Netherlands	1621.00
Poland	345.51
Portugal	411.49
Slovakia	74.87
Slovenia	93.30
Spain	2403.78
Sweden	2292.00
United Kingdom	8815.44
Total	36,476,51

Source: Estimation from eGEP questionnaire, except for UK data taken from Kable report *ICT spend in the European public sector to 2007*¹²⁶.

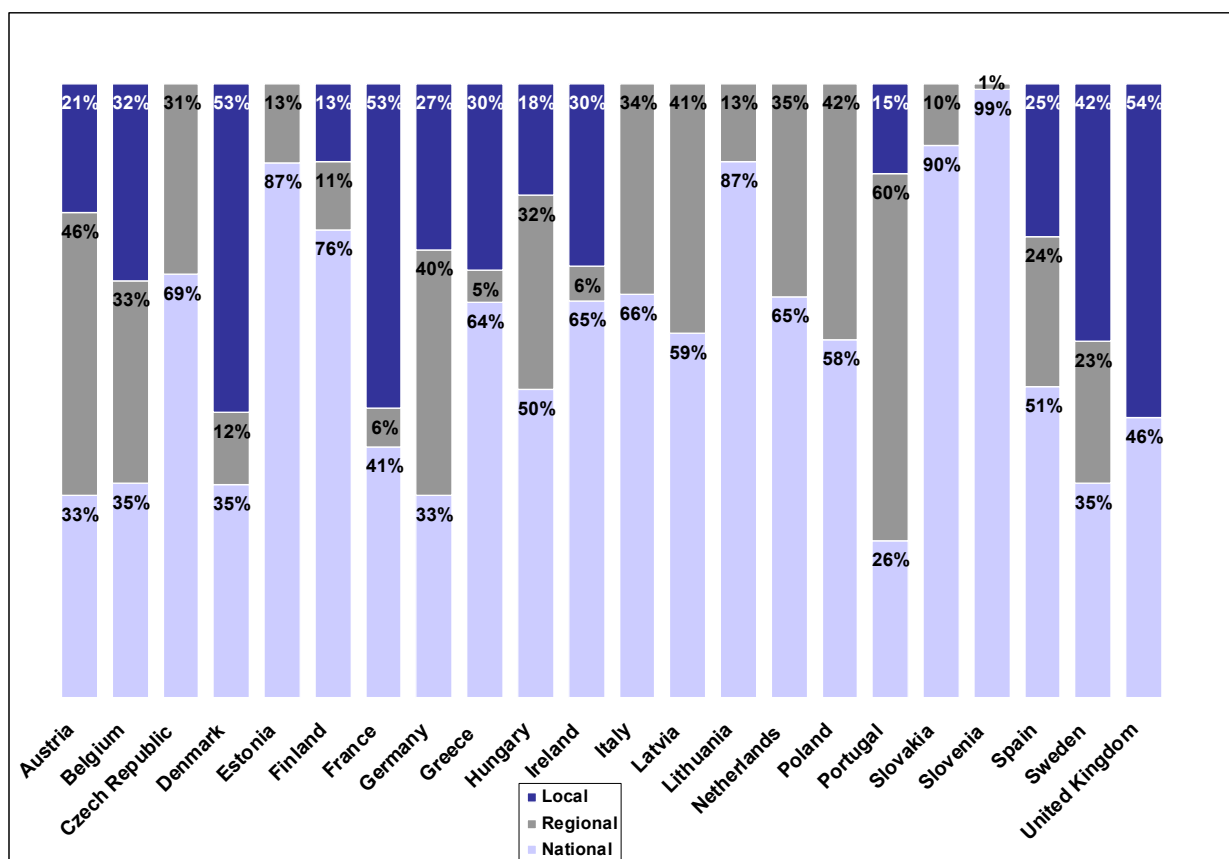
The EU15 subtotal is about €34.9 billion, which compared to the EITO 2002 data, represents a growth of 19.1%, or an average annual growth of 9.6%. This is, at first sight, in stark contrast with the annual average growth rate of 3.7% presented in EITO 2002 that, if applied to the EU15 would have produced a total for 2004 of about €31.5 billion. There is therefore a difference of about €3.4 billion between eGEP assessment and what could have been forecasted using the EITO 2002 growth rate. This difference is, however, explained almost entirely by the higher figures eGEP reports for the UK and Sweden. The United Kingdom figure¹²⁷ is about €2.1 billion

¹²⁶ The data provided obtained for the UK by the Office of Government Commerce (OGC), during eGEP UK filed mission in May 2005, regarded 2003 and only central government expenditure. Besides, in the course of the interview, OGC representatives clearly stated that the data was only indicative and did not entirely capture all central ICT level expenditure. For this reason, only in this case did we decide to use Kable data instead of that obtained through our questionnaire.

¹²⁷ As fully credited we have taken this figure from the cited Kable report.

higher than that estimated using EITO 2002 growth rate, whereas that of Sweden¹²⁸ is about €0.8 billion higher. So these two countries account for €2.9 billion of the €3.4 billion difference mentioned earlier (85.3%). If the growth rate is thus recalculated comparing eGEP total for 2004 (without UK and Sweden) with EITO 2002 figures for 2002, this would produce an annual growth rate of 4.6% between 2002 and 2004 that is in perfect line with the considerations presented in paragraph 4.2. The biggest jump in expenditure is that of the United Kingdom and is fully understandable in light of the strong drive in large projects launched in recent years and is confirmed in various market research press releases and secondary sources screened. Exhibit 12 below shows how ICT expenditure breaks down into the different administrative layers in all the EU25 countries where this distinction is applicable¹²⁹.

Exhibit 12: EU22¹³⁰ Total Public Administration ICT expenditure breakdown by administrative layer, 2004



Source: Estimation from eGEP questionnaire, except for UK data taken from Kable report *ICT spend in the European public sector to 2007*.

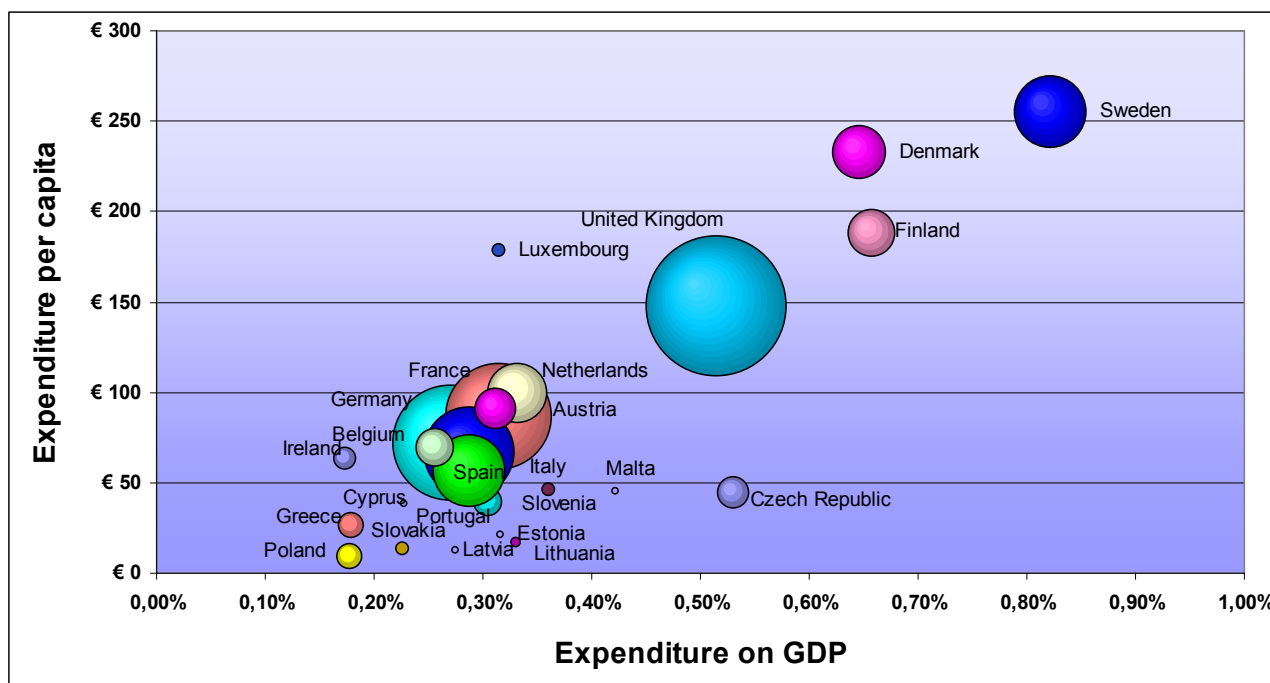
¹²⁸ Taken from the data obtained through eGEP questionnaire.

¹²⁹ In some cases data was received without distinction between the regional and local level. In order to reduce the level of inference and to present, as much as possible, the primary data obtained through questionnaires or official secondary data sources, we decided not to estimate the breakdown between the regional and local level.

¹³⁰ This breakdown is obviously not applicable to Cyprus, Luxembourg and Malta.

Adding up the regional and local level expenditure for the EU15 in order to compare with the EITO 2002 breakdown reported in Exhibit 12, we also find on average a 55% to 45% ratio with respect to the central level share of ICT expenditure. It must be pointed out, however, that in 8 of the countries of the EU15, the regional and local level aggregate share is higher than the 55% average as can be gathered from the Exhibit above. When considering the distribution of such expenditure through the different administrative layers, it is possible to identify different groups and tendencies. In fact, Federal States present a distribution equally divided between the three layers, as in the case of Belgium, or even cumulated (regional and local) proportions superior to 60% of total expenditure (Austria, for example). Similar remarks can be made for those countries with a highly decentralised administrative asset, which present analogous breakdowns (i.e., Denmark, Sweden, etc.). In countries with a more centralised administrative system, central government constitutes the largest part of the ICT expenditure (i.e., Ireland, Italy, Czech Republic, etc.). As already mentioned, the United Kingdom has the highest amount of expenditure, mainly as a consequence of the investments made for the achieving of the government's 2005 deadline for the implementation of eGovernment. The local administration's part in such expenditure represents more than half (54.44%) of total disbursements, making UK local government the largest ICT market in Europe.

Exhibit 13: EU25 Public Administration ICT Expenditure per capita (vertical axis), as % of GDP (horizontal axis) and total size (bubble dimension) in 2004



Source: Estimation from eGEP questionnaire data, except for UK data taken from Kable report *ICT spend in the European public sector to 2007*; GDP and population data taken from Eurostat Portal.

Exhibit 13 above provides a picture of Public Administration ICT expenditure per capita and on GDP in EU Member States. The bubble indicating total size of

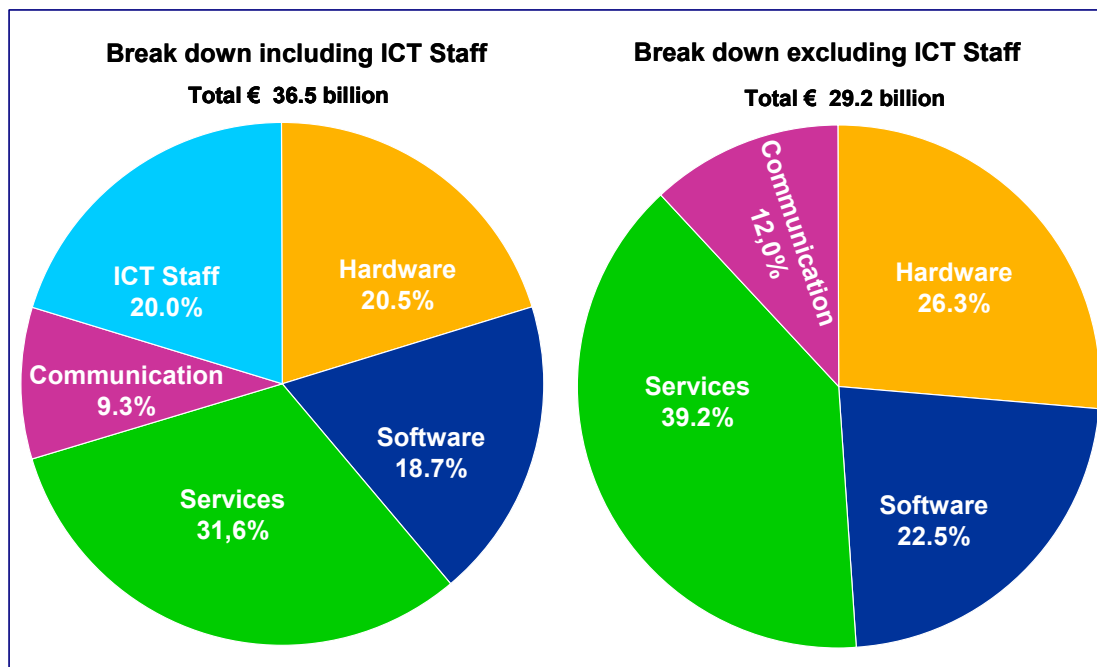
expenditure shows that the biggest public administration ICT markets are, in order, United Kingdom, Germany, France, Italy (blue bubble) and Spain (green bubble). When the expenditure is weighted by the total population and/or GDP, it becomes clear how the highest positions are occupied by those countries that also register high performances in Information Society indicators, namely Sweden, Denmark and Finland. It can also be seen how the United Kingdom is catching up with the Scandinavian/Nordic cluster, distancing itself from a second group that roughly includes France, Germany, the Netherlands, Austria, and Belgium, whereas Italy and Spain fall a bit behind this second group. Among new Member States, the higher volumes of expenditure are performed by the Czech Republic that has also good values in Information Society indicators.

Exhibit 14 below presents the total Public Administration expenditure breakdown into its components, in two versions, one including and one excluding ICT Staff. This allows us to compare the figures with those of EITO 2002 reported in Exhibits 9 and 10. Both the first and second versions present slight changes with respect to the 2002 breakdown. There is a clear tendency toward increasing services and communication shares of total expenditure, and a decreasing hardware and ICT staff shares.

The second version of the breakdown, excluding ICT Staff, is more of interest to us in relation to the discussion on the organisational dimension of expenditure and of their ratio vis-à-vis hardware and software discussed in paragraphs 2.3 and 2.5. In this respect, the service share (including various type of consulting and operational support services) is the closest proxy indicator of the organisational change costs¹³¹. This second version of the breakdown we estimated shows that the aggregated technological elements still command the greatest share of expenditure: ICT components (hardware, software and communication) amount to 60% of expenditure, whereas services, representing the best proxy indicator for the cost of organisational change, barely reach 40%.

¹³¹ Our argument is that the cost of ICT staff should not be added to that of services and considered the proxy indicators of such organisational change costs, as they are simply fixed costs internalised within the budget of each public agency and cannot be considered as indirect indicators of the often intangible costs of reorganisation.

Exhibit 14: EU25 ICT expenditure breakdown by components (including and excluding ICT Staff), 2004



Source: : Estimation from eGEP questionnaire data;

This 60% to 40% macro-level ratio, assuming that spending in services represents an indication of the cost of organisational change, is still far from the 45% to 55% suggested in eGEP micro-level 'rule of thumb' presented in para. 2.5. It is evident, however, that the expenditure in services is an underestimation of the full cost of organisational change, a large part of which remains hidden and is not captured in this aggregated data.

4.3.3. eGEP eGovernment Expenditure Assessment

We now come to the assessment produced for total Public Administration eGovernment expenditure, whose aggregate figures are reported in table 10 below. Before commenting on the data in table 9 and other data reported in Exhibit 16 and 17, a first comparative analysis of eGEP estimates for total eGovernment expenditure for 2004 with the figures produced by EITO for 2002 is needed with the support of Exhibit 15.

As can be recalled, EITO 2002 estimated eGovernment expenditure for the EU15 in 2002 at €6.6 billion, or 22% of total Public Administration Expenditure. Besides, EITO 2002 expected eGovernment to grow annually at 15%. If we start from the €6.6 billion figure and apply the 15% growth rate, the figure in 2004 would be about €8.7 billion for the EU15.

On the other hand, eGEP assessment for 2004 sets eGovernment expenditure for 2004 at €11.5 billion, or 33% of total Public Administration Expenditure. EITO 2002

and eGEP figures are not, however, entirely comparable as these are based on different definitions of eGovernment. eGEP operationalisation of eGovernment expenditure derives from the broader definition of eGovernment adopted by the EU Commission in 2003, whereas the EITO definition is restricted to the front-end dimension of eGovernment.

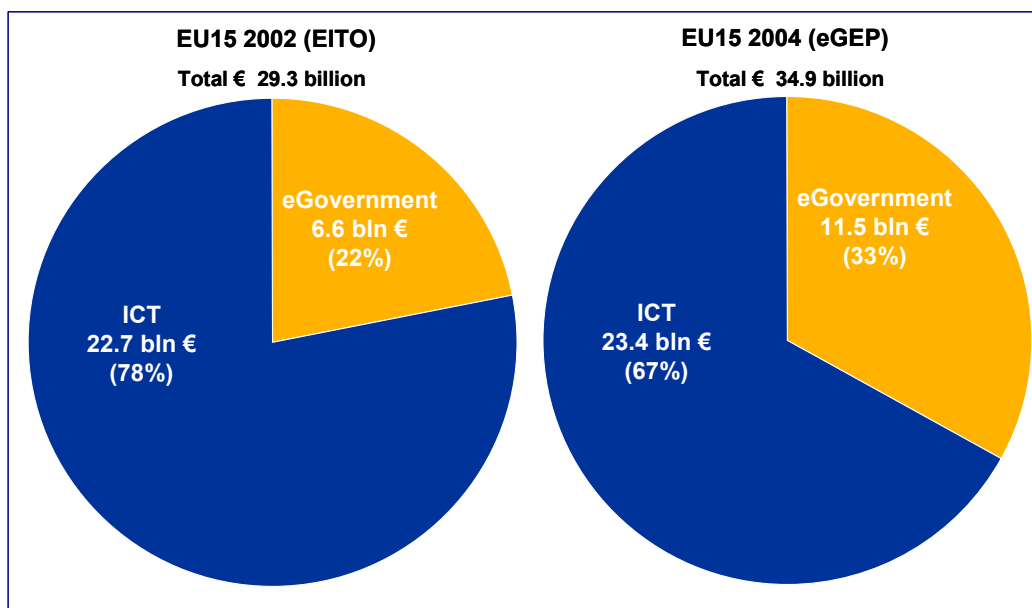
We therefore propose a larger share of eGovernment since in our estimate, we took into account our more broader operationalisation of eGovernment expenditure. Actually we should claim that the €11.5 billion figure, is still a fairly conservative estimate. In the responses to our questionnaire, the majority of Member States representatives considered the enlarged EU definition of eGovernment the more appropriate, but nonetheless provided data or estimates setting eGovernment expenditure at no more than 25% of ICT expenditure.

Table 10: Public Administration eGovernment expenditure

Country	Expenditure (Mio euro)
Austria	160.69
Belgium	141.61
Cyprus	3.80
Czech Republic	228.50
Denmark	479.58
Estonia	20.32
Finland	389.02
France	1895.85
Germany	2065.51
Greece	71.22
Hungary	52.94
Ireland	61.76
Italy	726.00
Latvia	2.58
Lithuania	11.20
Luxembourg	26.80
Malta	4.15
Netherlands	578.21
Poland	26.78
Portugal	134.93
Slovakia	6.81
Slovenia	30.98
Spain	468.74
Sweden	904.19
United Kingdom	3408.90
Total	11900.90

Source: : Estimation from eGEP questionnaire data;

Exhibit 15: EU15 eGovernment as a % of ICT expenditure 2002 and 2004



Source: eGEP elaboration on EITO 2002, p. 286 for 2002 and estimation from eGEP questionnaire data for 2004

In our view this reflects the shortcomings and difficulties in recording and gathering precise eGovernment expenditure data, which leads to an underestimation. So, using appropriately selected contextual parameters, we have modified such data and/or estimates upwards. Following our basic principle of using the primary data and/or estimates provided by Member States as much as possible, without going to far in inferential estimation, this upward estimation has been very limited.

We therefore present a larger share of eGovernment since we took into account our more broader operationalisation of eGovernment expenditure in our estimation. Actually we should claim that the €11.5 billion figure, is still a fairly conservative estimate. In response to our questionnaire, the majority of Member State representatives considered the enlarged EU definition of eGovernment the more appropriate one, but nonetheless provided data or estimates setting eGovernment expenditure at no more than 25% of ICT expenditure. In our view this reflects the shortcomings and difficulties in recording and gathering precise eGovernment expenditure data, which leads to an underestimation. So, using appropriately selected contextual parameters, we have modified such data and/or estimates upwards. Following our basic principle of using the primary data and/or estimates provided by Member States as much as possible, without going to far in inferential estimation, this upward estimation has been very limited.

On the other hand, a few countries replied that they considered the data provided to us as ICT expenditure as not being much higher than eGovernment expenditure. The two most noteworthy cases are the United Kingdom and Sweden. The UK representative replied to us that they considered all of ICT figures as expenditure for

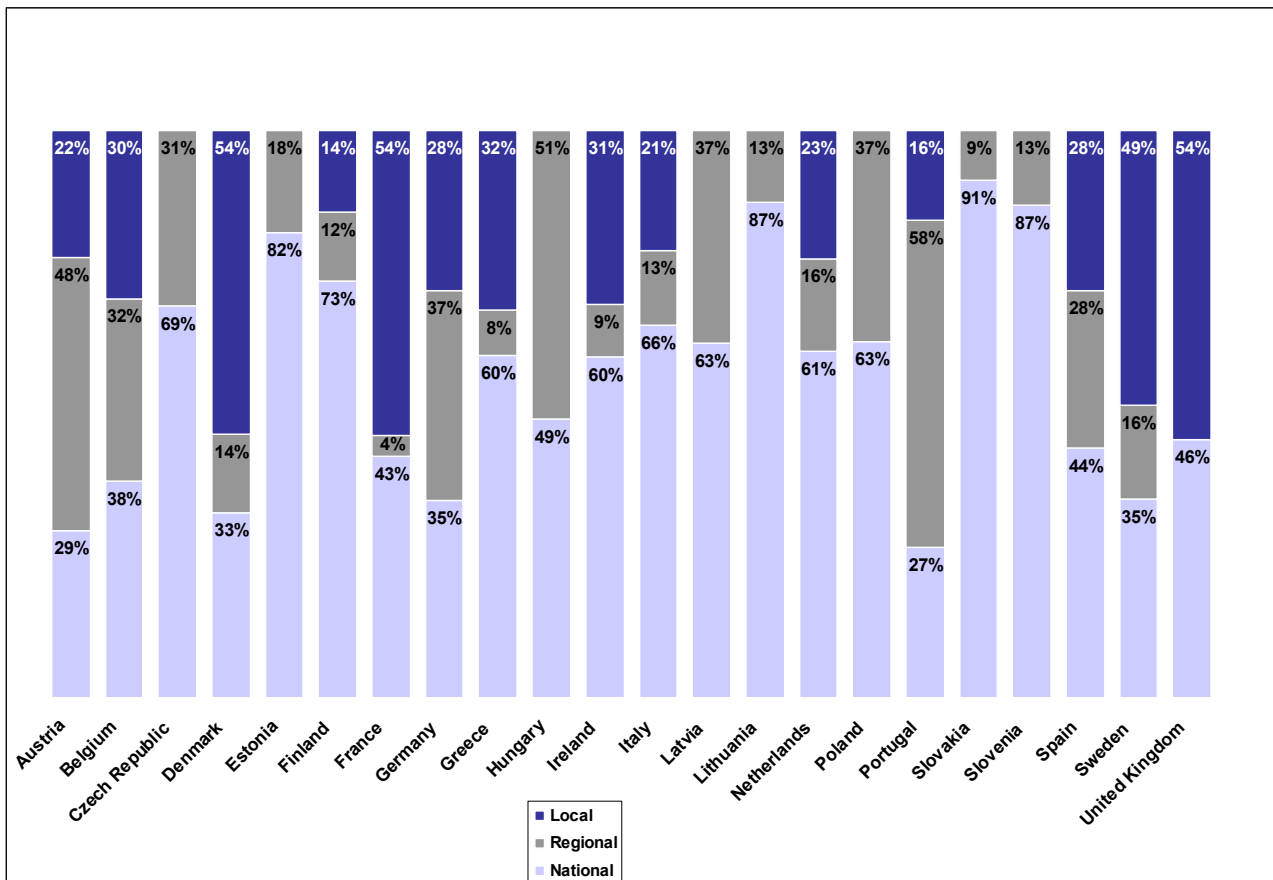
“IT enabled Public Administration” and practically the same as eGovernment expenditure. Sweden estimated that eGovernment expenditure could fall somewhere between 60% and 80% of ICT expenditure. If we were to accept the data and estimates provided by UK and Sweden, the actual total eGovernment expenditure for the EU15 in 2004 would be €17.6 billion. For reasons of comparability, using contextual parameters and within cluster comparisons, we took the liberty to estimate eGovernment expenditure figures for Sweden and the United Kingdom downwards.

Our conviction is that, if and when EU Member States will agree on a common operationalisation of eGovernment expenditure (reflecting the broader EU definition of eGovernment) and thoroughly gather the data, the share of eGovernment expenditure over ICT expenditure will be considerably higher than the 33% eGEP estimated for 2004.

Returning to the data in table 10, if we compare eGovernment expenditure to public Administration ICT disbursements, it is possible to notice that the larger markets are the same (United Kingdom, Germany and France), with the exception that Sweden spends more than Italy and Spain in eGovernment. Taking into consideration the breakdown of eGovernment expenditure by administrative layer (Exhibit 16 below), we can observe a general and noteworthy tendency: regional and local percentages cumulated are likely to be higher than in the ICT breakdown. This further confirms the growing relevance of the regional and local dimension in the delivery of online public services. Naturally for eGovernment spending, difference can also be observed. Federal and highly decentralised countries present local and regional (cumulated) percentages higher than national ones (i.e., central government expenditure). Moreover, the United Kingdom still represents the largest market. More centralised states register national proportions higher than 50%. The French exception can be explained by the recent reform of the administrative system, which has granted more functions to local administrations (the so-called *collectivités territoriales*)¹³², but also by the presence of big cities, such as Paris, which represent a great amount of local expenditure. Even in eGovernment cases, the assessment of the expenditure percentages by layers was not possible for Cyprus, Malta and Luxembourg. In other cases (such as Latvia, Lithuania, the Czech Republic), the data gathered was distinguished between central and peripheral administrations, but it was not possible to differentiate between regional and local expenditure.

¹³² The reform was introduced in 2003 by the Loi Constitutionnelle n. 2003-276 of March, 28th, 2003, which is available at <http://www.presidence.pf/stock/tree/pdf/13331.pdf>, accessed January 2005.

Exhibit 16: eGovernment expenditure breakdown by administrative layer



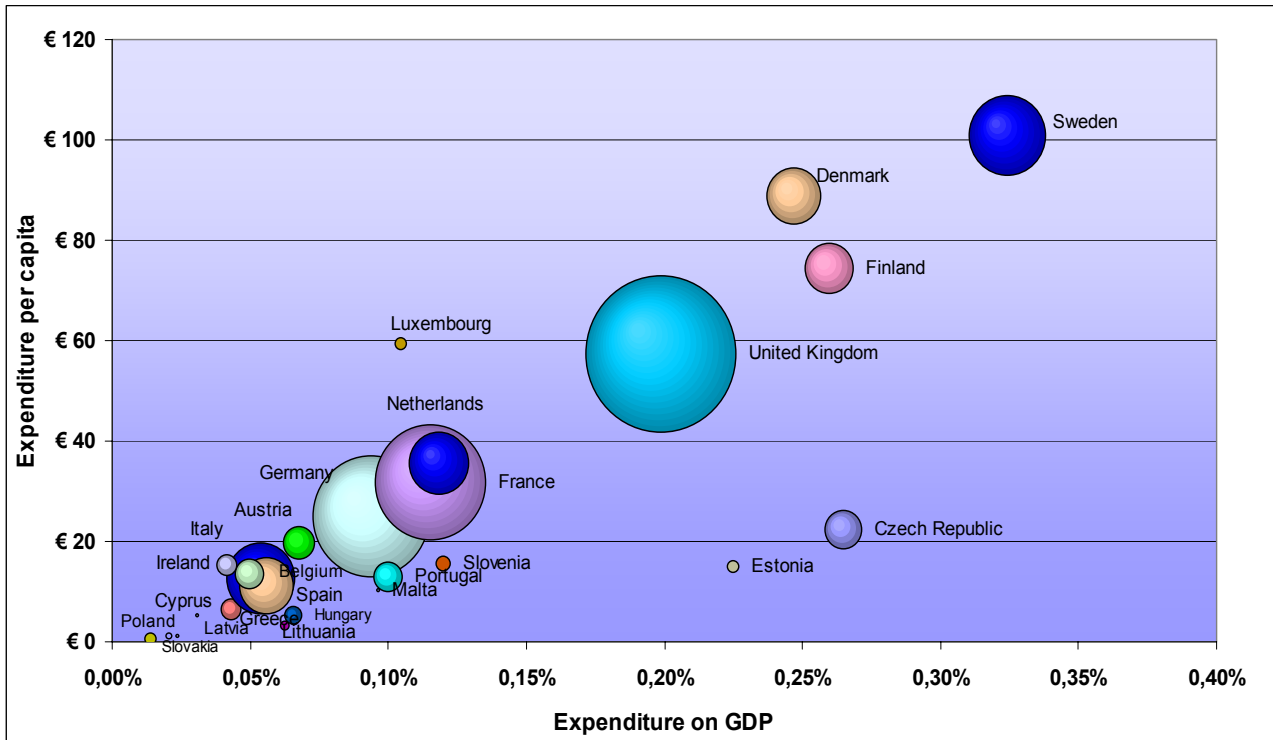
Source: : Estimation from eGEP questionnaire data;

Exhibit 17 below represents the distribution of Public Administration eGovernment expenditure per capita and on GDP in EU Member States. Even in this case, the highest places are occupied by Sweden, Denmark and Finland, which also have the highest scores in eEurope benchmarking for Online Sophistication and eGovernment Availability Indexes¹³³. United Kingdom volume of expenditure is consistent with the investments required for the achievement of the government’s 2005 ambitious target of full electronic service delivery. Among new Member States, the best performances are reported by the Czech Republic and by Estonia, the latter having very good scores in both Online Sophistication (78%) and eGovernment Availability (63%) Indexes¹³⁴.

¹³³ EU Commission, DG Information Society and Media, (March 2005), *Online Availability of Public Services: how is Europe progressing? Report of the Fifth Measurement, October 2004*, prepared by CapGemini, available at http://www.eu.int/information_society/eeurope/2005/doc/all_about/online_availability_public_services_5th_measurement_fv4.PDF

¹³⁴ *Ibid.*

Exhibit 17: EU25 Public Administration eGovernment Expenditure per capita (vertical axis), as % of GDP (horizontal axis) and total size (bubble dimension) in 2004

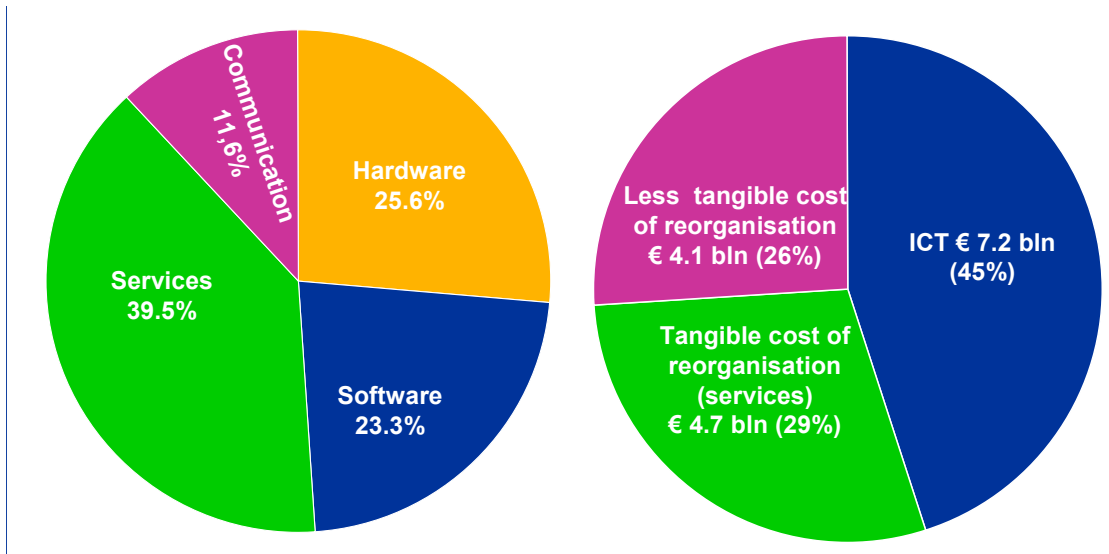


Source: Estimation from eGEP questionnaire data; GDP and population data taken from Eurostat Portal.

Finally, the last dimension to address would be the eGovernment expenditure break down into components (hardware, software, services, etc.). In this respect, however, the countries that provided us data and/or estimates on eGovernment expenditure break down into its components were too few in order to enable us a reasonable estimation based on 'within clusters' comparisons. The level of inference would have been too high if we were to produce such estimation and we opted for avoiding it.

More reasonably we can start from the components break down produced for ICT expenditure and develop a reasonable consideration for eGovernment in light of the discussion of the intangible cost of organisational change developed in par. 2.3 and of eGEP 'rule of thumb' presented in par. 2.5 (see Exhibit 18 in next page).

Exhibit 18: eGovernment Components break Down



So let us assume that eGovernment Expenditure in EU25 can be broken down along the same percentages of ICT expenditures. This would mean that, using the break down without the ICT staff, the technology side (hardware, software, communication) would amount to 60.5% of the total eGovernment expenditure, that is rounding up € 7 billion, whereas services would amount to 39.5%, namely the remaining € 5 billion. We can proceed by making the reasonable assumption that the figure thus obtained for the ICT side of expenditure is pretty close to the exact figure, since hardware, software and communication are tangible costs likely to be recorded thoroughly. On the contrary the € 5 billion spent in services is only a proxy that clearly underestimates the cost of organisational change.

Now if we apply eGEP 'rule of thumb' of a 45% to 55% ration between the ICT cost and the full cost of organisational change, then we would have that € 7 billion = 0,45x, and x is thus equal to € 16 billion. This would be the full cost of eGovernment, where the cost of organisational change would be € 5 billion in tangible services expenditure plus an additional 4 billion of intangible costs of organisational change. Obviously this last figure is a theoretical one, as it assumes that all the public administrations would engage wholeheartedly in the complex process of organisational changes that are needed to fully leverage the potentiality of ICT for increasing productivity and, subsequently, achieve the expected efficiency, effectiveness, and democracy impacts.

5. Concluding Recommendations

1. Establish a working group on eGovernment expenditure

Launch, jointly with the OECD eGovernment project, a working group – including EU and OECD experts, senior budget officials from Member States (MS), MS representatives of institutions in charge of eGovernment, and statisticians (from Eurostat and national statistics offices) – in order to agree upon an operational definition of eGovernment Expenditure in the light of current accounting practices both at a national and micro level of individual public administrations.

2. Stimulate the adoption of robust eGovernment cost monitoring techniques

Use the **Good Practice Framework**, future **eEurope Awards**, the **Framework Program funding** (i.e., for projects developing combined software applications and business process design tools supporting Activity Based Costing applications to eGovernment) and other mechanisms (ad hoc seminars, web and paper dissemination of a short guide, etc.) to disseminate knowledge of cost monitoring techniques and stimulate their adoption.

3. Raise awareness on innovative eGovernment financing mechanisms

Finance an ad hoc white paper reporting in-depth case studies on success stories of innovative financing mechanisms (including those based on PPP and those based on the horizontal pooling of resources by several public agencies) in and beyond the EU boundaries, and organise a conference involving eGovernment institutional stakeholders from all tiers of government to enable exchanges of experience and networking.

For further information about the eGovernment Unit

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European Commission
Information Society and Media Directorate-General
eGovernment Unit

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Tel → (32-2) 299 02 45

Fax → (32-2) 299 41 14

¶

E-mail → EC-egovernment-research@cec.eu.int

Website → europa.eu.int/egovernment_research

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