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DG Information Society and Media
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Compendium to the Measurement Framework

Abridged Version

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Measurement Framework Compendium Presentation

The present compendium tries and synthesises all the supporting work carried out from January till November 2005 in the elaboration of eGEP measurement framework, in terms of data gathering, literature review, analysis and discussion. It contains all the details that for reason of space are left out in the Measurement Framework final report, but which are cited and referenced in such report.

Section 1 reflects the awareness of eGEP work with respect to the importance of countries peculiarities. The logic of measurement rests on the simple fact that what you measure depends on which strategic objectives you pursue. Therefore it is evident that national peculiarities shape the measurement targets for which indicators must be developed and limit the applicability of a general rigid measurement framework suitable for all 25 Member States. ...

Section 2 presents an extensive but still synthetic, if compared to the work carried out in support of the Measurement Framework, overview of the state of play. This overview includes first the discussion of the challenges of measuring outputs and outcomes of the Public Sector in general, then a specific discussion of the challenges for eGovernment measurement. It then proceeds with the mentioned general overview of studies and reports and with the comparative analysis of running methodologies and concludes with the lessons learnt from this work.

Section 3 discusses in some details the issue of the sources of data needed for the measurement indicators and devotes a particular attention the topic of measuring users' satisfaction and service quality. Here all the detail supporting the proposal and assessment of indicators contained in the Measurement Framework report are presented.

Finally **Section 4** provides the theoretical underpinning of eGEP Measurement Framework Implementation Methodology.

1. Country Peculiarities and the Logic of Measurement

1.1. Context Matters

...

1.2. Identifying Measurement Targets

...

In fact, the first step in building a measurement framework is to define the overall objective(s) of the projects and/or programmes to be measured and its basic components. The first and foremost important condition that a measurement framework must meet is that its indicators are relevant to the mission objectives or end-results pursued.⁵ To put it differently "...at their most basic level, mission-aligned measurement framework are intended to clearly define 'enhanced value'."⁶

...

⁵ See, for instance, Hatry, H., *Performance Measurement: Getting Results*, Washington, D.C., Urban Institute Press, 1999.

⁶ Carl DeMaio (ed.), *Creating A Performance Based Electronic Government*, (Reference # 15 in table 2 below and in Annex A)

1.3. Hints from European Commission and Member States

With respects to the objectives and the corresponding impacts to be selected as target for measurement can be found, first of all in European Commission *eGovernment Communication*, as well as in other documents referenced in the *Communication*, such as the *Lisbon Strategy* and the *eEurope* action plans (2002 and 2005). **Exhibit 3** below outlines the main hints contained in the *Communication*, whereas in **Exhibit 4**, integrating the *Communication* with other relevant EU policy documents, illustrates an extensive unstructured list of objectives/impacts at different level of abstraction is derived.

Analysing the most recent publicly available eGovernment strategy and more general policy documents for all of 25 EU Member States, we identified a list of declared eGovernment objectives as well as what seems to be, at least from the documents reviewed, the current priority focus of major initiatives. **Table 1** in next page summarises this work using the following notation: the icon indicates declared objectives, whereas the icon indicates that a particular objective is also the current priority focus of major initiatives. The objectives plotted in the table columns are our conceptual re-organisation from the analysed document in the sense that we aggregated under a number of labels objectives that in our view, although phrased differently, belonged to the same group.

Indeed the indications from the EU documents and from the analysis of Member States eGovernment objectives (Table 1), are fairly exhaustive, but do not provide an overall structure organising the various elements into a general model ...

Exhibit 3 Extracts from eGovernment Communication (COM(2003)567)

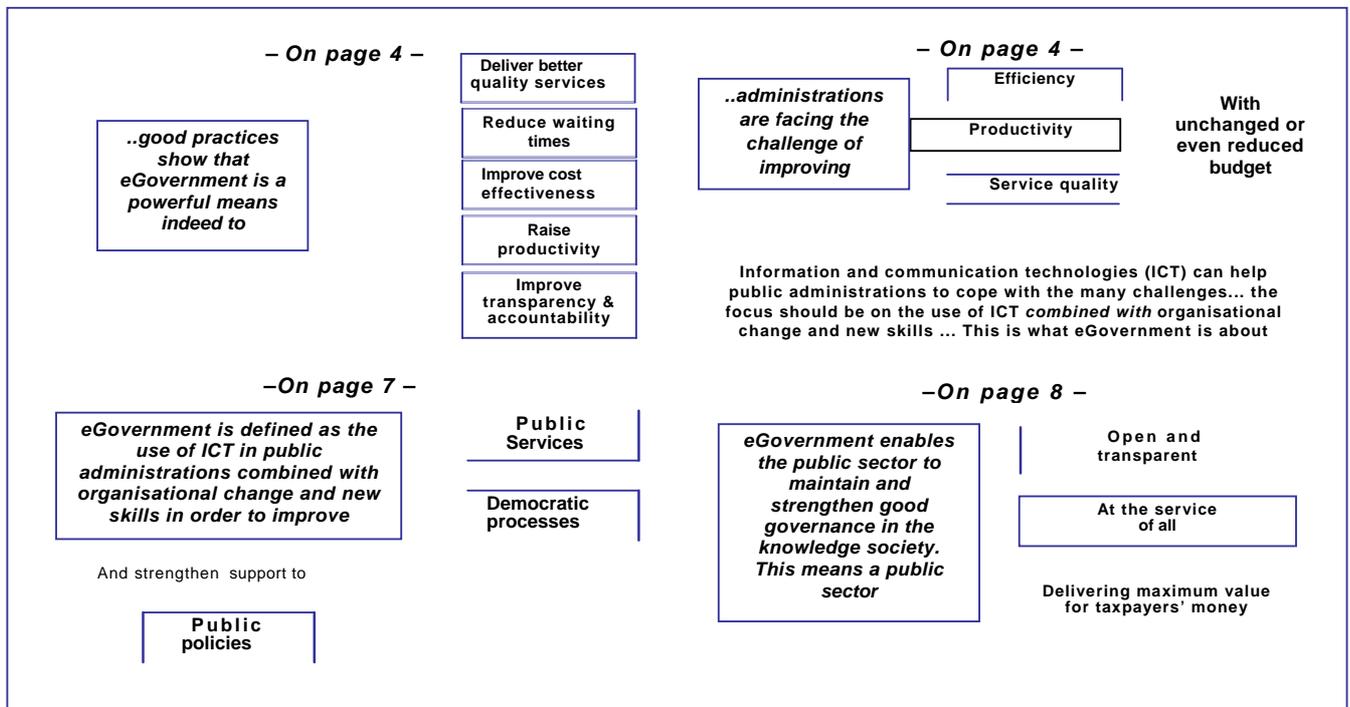


Exhibit 4 Unstructured List of Relevant Items from Relevant EU documents

- GDP growth
- Employment growth
- Increased socio-economic cohesion
- Openness, transparency & accountability
- Maximum value for taxpayers' money
- Quality of services
- Reduction of waiting times
- Better cost-effectiveness
- Service to all
- Quality of life
- Competitiveness
- Cooperation among administration
- Inclusiveness
- Reduction of administrative burden
- Efficiency and productivity
- Socio-economic development at large
- Support to public policies
- Support to democratic processes
- Public information as accessible as possible
- Basic public services online
- Broadband
- Interoperability
- Interactive public services
- Better public procurement
- Public Internet Access Points
- Culture and tourism

Table 1 Main objectives and focus on in each country

	Service perspective			User perspective					Government perspective			Economic perspective	Legal perspective
	Automation	Service delivery	Quality	Access/Social Inclusion	Administrative simplification	Trust/Privacy and Security/Transparency	Take-up	eDemocracy	Back office optimisation	Joined-up government/inter-institutional cooperation	HR Development	Efficiency	Regulatory framework
Austria		🎯	🔍		🎯 🔍		🔍	🎯	🎯 🔍	🎯			
Belgium				🎯	🎯 🔍	🎯 🔍	🎯		🎯 🔍	🎯			
Cyprus	🎯	🎯		🎯	🔍								
Czech Republic		🎯		🎯	🎯	🎯	🎯		🎯 🔍	🎯 🔍		🎯	🎯 🔍
Denmark			🎯				🎯 🔍		🎯 🔍			🎯	
Estonia		🎯 🔍		🎯 🔍		🎯	🎯	🎯 🔍	🎯 🔍	🎯	🎯	🎯	
Finland		🎯 🔍		🎯 🔍	🔍	🎯	🎯		🎯 🔍	🎯		🎯	
France		🔍			🎯	🎯	🎯		🔍			🎯 🔍	
Germany		🎯 🔍		🎯		🔍	🔍		🎯 🔍	🎯			
Greece		🎯 🔍			🔍		🔍		🎯	🎯			
Hungary		🎯 🔍					🎯	🎯	🎯			🎯	
Ireland				🎯	🔍		🎯 🔍		🎯 🔍	🎯		🎯	
Italy		🎯	🎯			🎯	🎯		🔍	🔍	🎯	🎯	
Latvia				🎯					🔍	🔍			🎯
Lithuania		🔍		🎯			🎯 🔍	🎯	🎯 🔍				🎯
Luxembourg		🔍		🎯			🎯		🎯 🔍	🎯	🎯		
Malta		🔍		🎯	🔍	🎯	🎯	🎯	🎯			🎯	🎯
Netherlands		🔍					🎯 🔍		🎯	🎯			🎯 🔍
Poland		🎯 🔍		🎯	🎯				🎯	🔍		🎯	
Portugal			🎯				🎯 🔍	🎯 🔍	🔍	🔍			
Slovakia		🎯 🔍		🎯	🎯	🎯	🎯		🎯 🔍	🎯		🎯	🎯
Slovenia		🎯			🔍				🎯 🔍	🎯		🎯	🎯
Spain				🎯 🔍			🎯 🔍		🎯 🔍	🎯			🎯
Sweden		🎯 🔍	🎯 🔍						🎯 🔍	🎯			🎯
United Kingdom		🎯 🔍		🎯		🎯	🎯		🎯 🔍	🎯 🔍	🔍	🎯 🔍	

Government objectives

Focused objectives

2. The State of Play

2.1. The Challenges of measuring public sector performances⁷

The difficulty of measuring public sector performances and in particular output is testified by the fact that, as reported in the recently published *Atkinson Review*⁸, in the UK and in many other countries from 1960s until very recently the convention was used that **input = output**. In other words the output of the public sector has been measured as of equal to the total value of the inputs (i.e. compensation of employees, procurement cost of goods and services, quota of consumption of fixed capital, etc.).

In order to better understand these difficulties the following important distinction must be made within the general category of public sector output:

- **Individual goods and services:** those that are consumed by individual households;
- **Collective services:** those that are provided simultaneously to the society as a whole⁹.

This distinction – which more or less coincides with the one found in the public economics literature between private goods with externalities (individual services) and public goods (collective services) where consumption is ‘non rival’ and nobody can be excluded from it¹⁰ – is important since measurement is allegedly more difficult in the latter case of collective services. Examples of individual services are:

- Education services;
- Health and social work services;
- Selective social security services;
- Other personal and community services (i.e. recreation and cultural services, sewage and refuse disposal services, sanitation and similar services, etc)¹¹

Examples of collective services are:

- Administration services of the state and the economic and social policy of the community, that is to say general public administration;
- Provision of services to the community as a whole (e.g. defence, justice, police, fire brigade);
- Compulsory social security services¹²;

⁷ The literature on the measurement of public sector performances and output is vast and growing and it is beyond the scope of this report to review it. In this paragraph we limit our analysis to pinpoint the most crucial aspects of the topic resorting to a few recent studies, with no claim to review such literature exhaustively.

⁸ *Atkinson Review: Final report. Measurement of Government Output and Productivity for the National Accounts*, London, Palgrave MacMillan, January 2005, p. 12 (http://www.statistics.gov.uk/about/data/methodology/specific/PublicSector/Atkinson/downloads/Atkinson_Report_Full.pdf, accessed February 2005). This is an independent review of the measurement of government output in the National Accounts, that was commissioned to Sir Atkinson by the UK National Statistics Office.

⁹ The distinction is explained in details in Eurostat, *European Systems of Accounts*, Brussels, 1995, par. 3.82-3.87 and in Eurostat, *Handbook of Price and Volume Measures of National Accounts*, Brussels (2001 edition), p. 37 and pp. 112-113.

¹⁰ On this distinction see the classic analysis of Musgrave, R.A. and P.B. Musgrave, *Public Finance in Theory and Practice*, New York, McGraw-Hill Book Company, 1984.

¹¹ Eurostat, *Handbook of Price*, *op. cit.*, p. 37 and more in detail 114-128.

The convention **input = output** has been increasingly challenged by the view that the output of the public sector should be measured autonomously and as such be included in National Accounts. This view has been adopted by the United Nations System of National Accounts (SNA)¹³ and later by the European System of Accounts (ESA 95)¹⁴. ESA 95 has established a general A/B/C classification to be applied also to the measurement of the category of non-market output (of which public sector output represents the biggest share) reported below:

- ▶ A methods: most appropriate methods;
- ▶ B methods: those methods which can be used in case an A method cannot be applied;
- ▶ C methods: those methods that shall not be used¹⁵.

For the measurement of output of individual services the **A method** is the use of **volume indicators** possibly valued at current prices¹⁶ and **adjusted to reflect quality**. **Lack of quality adjustment** is considered a **B method**. For individual services the use of **input** (i.e. number of employees) or **activity** (i.e. number of operations in hospitals) to measure output is considered a **C method**. It is worth stressing that quantitative numbers reflecting activities are actually process indicators, as they provide a proxy of task performed and can be used to measure the efforts produced. As correctly noted in a recent study that we will review below, in certain cases process indicators can also be used as indicators of production, as for instance in home care where the number of staff contact hours can measure the output¹⁷.

On the contrary for collective services, given further measurement difficulties, **the volume of activity and/ or input are considered B methods**. It is worth also noting that for ESA 95 outcomes indicators are considered not representative of the outputs and can at best be used as indicators of their quality.

As from 2006 **C methods will no longer be acceptable in National Accounts under a European Commission Decision of 2002**¹⁸, Member States have started to tackle the issue of developing methods to measure public outputs and are facing a number of difficulties that we briefly review below.

The basic and straightforward source of difficulty in measuring public outputs resides in the lack of market prices and mechanisms that can be used to value them. Actually it is not only a problem of giving a value to an output, but also of understanding how the output is received and evaluated by the end users, that is to say of including in the measurement also the quality dimension. Quality is a problematic issue also in the case of outputs produced for the market, where nonetheless the price gives at least a proxy indication of quality. In this case it can be assumed, in fact, that the quality difference between two products is translated in their market price, which in turn reflects consumer preferences¹⁹. In the market, consumers have usually at their disposal a number of 'exit choices' to signal dissatisfaction with a given good or service.

¹² *Ibid.*, p. 112.

¹³ United Nations et al, *Systems of National Accounts*, New York, 1993.

¹⁴ Eurostat, *European Systems of Accounts, op. cit.*. For the European standards In this paragraph we will refer to Eurostat, *Handbook of Price and Volume ...*, *op. cit.*, which is based on the ESA95. For a critique and analysis of the limits of the input=output convention for non market output see par. 3.1.2 of the *Handbook*.

¹⁵ Eurostat, *Handbook of Price and Volume...*, *op. cit.*, p. 4.

¹⁶ When it is possible to identify unit of output and multiply it by unit cost.

¹⁷ Social and Cultural Planning Office (SCP), *Public Sector Performance: An International Comparison of Education, Health Care, Law and Order and Public Administration*, SCP, The Hague, September 2004, p. 37.

¹⁸ As reported for instance in *Atkinson Review...*, *op.cit.*, p. 34.

¹⁹ Eurostat, *Handbook of Price and Volume...*, *op. cit.*, p. 34.

In the case of public outputs, exit options are very limited for individual services²⁰, and even more so in the case of collective services²¹, where rather than exit the way for users to be heard is through 'voice' (expressing their votes and/or organising some form of public opinion campaign).

Volume output indicators usually inadequately reflect the quality of services, although in some cases some objective measures could be found (*see infra*). Yet many relevant 'soft' sides of quality (i.e. how kind are public employees in the front-office) cannot be measured without resorting to subjective quality assessments of services by users. Without taking into account quality, measurement of output may lead to wrong conclusion on productivity and efficiency, when for instance the size of school classes is reduced (output per input decrease, but quality should increase). As an anticipation, we can report that Eurostat *Handbook* proposes three ways to adjust for quality²²:

1. Direct measurement of the quality of the output through a survey of the general public on the quality of public services;
2. Using the quality of the inputs and assuming that the quality change of the inputs leads automatically to a quality change of the output;
3. Using outcomes to measure the quality of the output.

...

2.2. The relevance of Measuring eGovernment Performances

...

Therefore, for some areas of collective services the difficulty does not depend only on the impossibility of measuring, but also on the fact that certain discrete and punctual data potentially available have not been gathered so far. We can then derive from the above the implicit suggestion that such indicators should be created and corresponding data gathered.

It is then natural to see that, depending on the capability of providing online transactional services and on take up (i.e. tax file online, change of residence completed online, mandatory enrolment and registration in various domains processed online, etc), through eGovernment precise and punctual data can be easily gathered on the outputs of several general public administration services. So measuring eGovernment could actually contribute to the general measurement of public sector performance by providing new data and also by taking into account the quality dimension. Referring to the two Eurostat *Handbook* proposals above eGovernment, in fact, contributes to quality in terms of speed and correctness of service delivery, to which one could add ease and convenience as well as reduction of administrative burden. These are all elements that can be directly measured (speed) or assessed through opportunity cost calculations.

This consideration brings us to tackle the hidden question whether a specific measurement of eGovernment performances as separate from the general measurement of public sector performance is necessary and legitimate. One could, in fact, argue that eGovernment is simply an additional delivery channel whose contribution in each domain of application is ancillary to the general production and delivery of public services, and therefore should be already taken care of in the indicators used to measure public sector outputs in general. Our view is that, currently, this objection is not valid for a number of reasons:

1. First, very simply, eGovernment needs at least some specific metrics to justify the investment required to make it happen. In a context of shrinking public budget, in which many countries have frozen public employees' turnover, the financial resources for eGovernment must show their payoff;

2. Second, also very simply, the current development of general measurement of public sector outputs is not yet such to really take into account some of the most innovative eGovernment contributions, which would get lost and not be accounted for;
3. Third, more fundamentally, eGovernment is not simply a delivery channel but it is increasingly a catalyst for organisational innovation and rationalisation, as well as for human resources revitalisation and empowerment. Besides increasing speed and accuracy of service delivery, eGovernment can contribute to radically change how governments go about their business as usual, including long ingrained cultural attitudes toward services delivery. Therefore it is strategically important to measure and show such potential results when they occur, so to trigger emulation in all sectors of the public administration (positive 'institutional isophormism');
4. Fourth, as indicators creation and data gathering should start almost from scratch and in certain areas the technology allows to register concrete and very precise data reflecting results not available for traditional delivery channels, in the field of eGovernment there is the potentiality to, so to say, 'leap-frog' ahead in term of the quality of the measurement system;
5. Last but not least, in the middle-term it is not unreasonable to foresee a conglotation of eGovernment measurement into a general measurement framework of public sector performances, to which the former will have given a very crucial push and contribution.

Having clarified the legitimacy of an eGovernment specific measurement framework, it is now possible also to make clear that in the case of eGovernment indicators and data must be constructed almost from scratch for two reasons, one of necessity and one of strategy.

First, given the novelty of eGovernment, there are no ready-made relevant statistics, similar to those used in the two studies reviewed above, to measure its performance, thus the construction of indicators for subsequent data gathering is a necessity. On the one hand socio-economic available data can be used to relate end outcomes to eGovernment. This is foreseen in our methodology especially with a more middle to long term perspective. Taking into account that there is always a temporal lag between the production of an output and the possible realisation of an end outcome, it is nonetheless our ambition to start evidencing the possible links between eGovernment services and possibly longer term outcomes reflected in widely available nationally and internationally compiled statistics. On the other hand, more direct and short term measures of the performances of public services provided through the eGovernment channel are needed. This implies defining the indicators, establishing an implementation methodology and then starting gathering the data.

Second, it is a strategic choice that of conceiving measurement as a purposeful gathering of information and comparing what you learn to some standard or expectation, that should be ingrained throughout every step and level of the eGovernment process, in a bi-directional bottom-up and top-down fashion: from the business case of single project to the central level monitoring of national programs and vice versa. In our view measurement cannot be a *post-hoc* discontinuous activity, but it must be a continuous process starting with the definition of target objectives and of the indicators to measure them, continuing with the process of gathering the relevant information, leading to a comparison between the target and the actual indicators data, which in turn feed again in the definition of target continuing thus the measurement cycle.

2.3. Challenges of eGovernment Performance Measurement

The fact that a comprehensive measurement framework for eGovernment, encompassing costs and benefits analysis and an understanding of macro level impacts, has yet to be developed and that the emerging attempts are facing serious difficulties in their implementation, depends to a large extent on a number of additional peculiarities with respect to the discussion above,

which make measurement more difficult than in the private sector. Since eGovernment is not any different from government, such peculiarities are in large part the same as those characterising in general the measurement of public service provision and in part linked to the novelty of the delivery channel used. There are three set of challenges hindering measurement:

1. Universalistic and multiple public value delivery;
2. Institutional conditions weakening incentives to measure;
3. Technical measuring difficulties;

Universalistic and multiple public value delivery. Public agencies must usually pursue a universalistic mission and serve all constituents, delivering multiple public values for the:

User as consumer: the search for quality services that are inter-active, user-centred, individualisable, inclusive, and maximise fulfilment and security;

User as tax-payer: the search for savings through dynamic, productivity-driven and value for money operations ('more for less'); and

User as citizen and voter: the search for good governance through open, transparent, accountable, flexible, and democratic practices.

From a technical point of view the multiplicity of the constituents served and of the goals pursued make the picture analytically blurred and can easily result in redundancies and overlaps. Should, for instance, the reduction in case processing time yielded by any given eGovernment application be measured as an efficiency (cost saving) gain or as usage gain for the consumer (reduction of administrative burden)? Dilemma such as this are very common in eGovernment and may produce too many measures for a single element. Redundancies in measures means that benefits may be counted several times thus weakening the actual power of measurement.

From a political perspective an even more relevant tension exists in term of the relative priority to be given to the measurement of efficiency (i.e. cost saving) and effectiveness (better services and constituency satisfaction) objectives. On the one hand, there is an increasing drive by governments, not only related to eGovernment but to the public sector performance in general, to financially evaluate and measure efficiency gains. On the other hand, public administrators in charge of eGovernment programs/projects tend to see them also and, sometimes primarily, as a public utility service for the provision of more value to citizens and businesses. In a leading-edge country in term of quantitative financial measurement of performances such as United States, for instance, a survey of public administrators in charge of eGovernment projects found that only 20% of them listed cost-efficiency gains as the main benefit of eGovernment, while the majority identify eGovernment as an instrument to enhance the achievement of their mission in term of customer satisfaction!³⁷ This tension in strategic perspective can also be easily translated into a technical discussion. In fact efficiency gains are allegedly those more easily measurable using quantitative direct or proxy financial indicators, whereas effectiveness gains can be measured sometimes only qualitatively through subjective evaluations or at best by complex financial evaluation of opportunity costs and time savings.

Institutional conditions weakening incentives to measure. First, rules and regulations often hinder or delay the possibility to exploit the full benefits potentially yielded by eGovernment applications (i.e. personnel redeployment) thus decreasing the incentive to measure.

Second, an agency capability of producing mission critical end results very often depends heavily on input and collaboration from other agencies. Thus, if measurement does not take into account for these interaction, an agency risks to be held accountable for results it was unable

³⁷ Survey conducted by the *Public Sector CXO Magazine* and reported in GSA, *op. cit.*, p. 6.

unable to achieve for reasons beyond its control. Paradoxically the more our government become 'joined-up' the greater is the difficulty in devising discrete measurement.

Technical measuring difficulties. First, eGovernment initiatives must deliver on tangible goals (i.e. reduction of case processing times), but also on intangible public values whose measurement is not immediate. The intangible dimension and lack of pricing mechanisms decrease the likelihood of identifying easily quantifiable measures that are distinguishable from one another and clear-cut. Second, eGovernment (as any other public output) can result in 'positive externalities' that are difficult to measure and especially difficult to attribute ('harvest dilemma'). In general, as pinpointed in the Commission eGovernment Communication:

...in the public sector there are definition and measurement problems for inputs and outputs. One problem is the pricing of public services, which is often not directly related to the inputs (taxation is not specific to the service provided). Also, as many online services are to a large extent information-based, they follow the rules of information economics in which marginal prices are approaching zero, and are thus not an indicator of the value of the service, while the operational costs of initial information development and maintaining information over its lifecycle, which can be significant, still have to be covered³⁸.

In principle a measurement framework should rest on clear-cut value drivers or mission critical results from which a set of measures and indicators are derived in such a way that they are, first of all quantifiable and easy to collect, but also logically consistent, namely:

- ▶ **Unique and mutually exclusive.** To the extent that an indicator is duplicated by, or overlaps with, other indicators, it becomes less important; and
- ▶ **Collectively Exhaustive.** Indicators should exhaustively cover all relevant aspects of the phenomenon measured with respect to the pursued mission results.

A mission aligned measurement framework comprising mutually exclusive and collectively exhaustive indicators is hard to reach for all of the three challenges considered above.

2.4. State of Play: General Overview

The topic of eGovernment impact measurement has gained momentum in recent years. As a matter of fact between 2002 and the first half of 2005 more than a dozen contributions, covering to some degrees the issue of measuring eGovernment impacts, have partially filled the gap existing on this topic and further confirm the progressing momentum (see Box 1 below).

A quite large number studies, reports, benchmarking exercises, evaluations and measurements have been carried out on eGovernment during the past five years. As part of the survey of the state of play we have reviewed 64 of them (see table 2). They include reports by market research and consulting companies (some of which commissioned by the European Union), academic institutions, international organisations, but also official documents released by national level institutions in charge of eGovernment both within and outside the European Union³⁹.

³⁸ Communication From The Commission To The Council, The European Parliament, The European Economic And Social Committee And The Committee Of The Regions; *The Pole of eGovernment for Europe's Future*, COM(2003) 567 final, September 2003, pp. 20-21.

³⁹ The synthetic overview of Member States measurement initiatives is based on: a) information gathered during the field missions accomplished so far (France, Germany, Netherlands, Poland, Spain, UK); b) answers to eGEP questionnaire (returned so far only by Finland, Hungary, Spain); c) desk research on documents available online. On the basis of these sources we can affirm that a centrally defined articulated measurement methodology is currently in use in Denmark, France, Germany, The Netherlands, and United kingdom. As policy and initiatives changes are not automatically translated into policy documents, it is possible that a number of other Member States are already using some performance measurement methodology focusing on impacts and not simply benchmarking the

Box 1 The Momentum: Selective list of Reports on eGovernment Impacts/ Benefits, 2002-2005 (*)

- **October 2002:** US Chief Information Office releases the *Value Measuring Methodology*, a guide for measuring the values and benefits of electronic services to be used by federal agencies;
- **October 2002:** Performance Institute, a Washington based think tank, publishes the report *Creating a Performance Based Electronic Government*;
- **April 2003:** the Australian National Office for the Information Economy (NOIE) releases a very extensive study on the benefits of eGovernment;
- **May 2003:** US General Services Administration (GSA) issues a report on High Payoff in Electronic Government, where eGovernment impact areas are classified;
- **July 2003:** Gartner presents the 'Public Value of IT' (PVIT) methodology to measure IT investments impacts over time on service level, operational efficiency and political return;
- **August 2003:** The UK Office for Government Commerce releases a guide on the measurements of eGovernment costs and benefits;
- **September 2003:** Deloitte Research publishes the report 'Citizen Advantage' proposing a methodology to measure the benefits of eGovernment for businesses and citizens;
- **October 2003:** European Commission's IDA programme, predecessor to IDABC, introduces the IDA Value of Investment (VOI) methodology focusing on the traditional return on investment (ROI) analysis but also on qualitative benefits;
- **February 2004:** new Danish National eGovernment Strategy contains clearly identified targets and their respective measurement indicators;
- **March 2004:** IBM Centre for the Business of Government publishes the paper *Measuring the Performance of eGovernment*;
- **August 2004:** The IT Department of the German Federal Ministry of the Interior releases version 4.0 of its WiBe methodology for the assessment of ICT project economic efficiency;
- **October 2004:** Treasury Board of Canada Secretariat releases a study on the measurement of eGovernment performances;
- **October 2004:** The CoBrA recommendations issued by the eEurope subgroup for eGovernment mention the need for a "common measurement framework";
- **November 2004:** A report commissioned by the Dutch Presidency of the European Public Administration Network ("Does eGovernment pay off?"), identifies several areas of eGovernment benefits;
- **December 2004:** The eGovernment Unit in DG Information Society and Media publishes *Top of the Web* survey of citizens and businesses identifies time saving and increased flexibility as benefits of eGovernment clearly perceived as such by the public;
- **February 2005:** EU IDABC eGovernment Observatory releases a background research paper on the impact of eGovernment on competitiveness, growth and jobs.
- **March 2005:** The French Agency for the Development of Electronic Administration (ADAE) unveils the new Mareva methodology to measure the benefits of the national eGovernment Program ADELE

(*) Detailed references to the above listed studies are presented in paragraph 2.5 of this section

number of service available online that, however, has not yet been published on the Internet and therefore escaped our attention. It is our expectation that, through future field missions and the returned questionnaires, we will be able in the final version of the measurement framework to provide the exhaustive picture for EU Member States.

The main results of this survey is that the overwhelming majority of the reports focuses on supply-side indicators (# of services available online) and/or e-readiness (presence/absence of structural and institutional conditions for the development of eGovernment and more in general of the Information Society), while an increasing, but still limited number, considers the demand side (i.e. take-up and satisfaction with services).

A total of 24 entries of the 64 screened deal to some degrees with the topic of measuring eGovernment concrete impacts. More precisely of these 24 entries:

⁹ In 5 cases eGovernment impacts is only an additional topic discussed briefly and the issue of measurement indicators is not touched

8 reports are entirely devoted to the analysis of eGovernment impacts, but contain no sustained analysis of measurement indicators

11 reports provide some insights into actual measurement mainly presenting micro-oriented business cases methodologies

Moreover, very few go as far as moving beyond the identification of impacts into the elaboration of an exhaustive list of concrete indicators and of an implementation methodology. Finally no study has attempted so far to produce a measurement framework, which includes also elements from an in-depth analysis of costs and which is based on an economic theoretical model of eGovernment impacts.

These results are presented in more details in **Table 2** reported in the next pages, of which we briefly explain here the logic. Inductively, from the first run of analysis of the various sources, we have identified four clusters of topics, namely : a) e-readiness; b) supply-side (of number and type of services available online); c) demand-side (take-up and partially user satisfaction); d) impacts. Then we identified for each item in the table its main topic (signalled in the cells with **M**) and whether it also deals with other topics in a supplementary way (signalled in the cells with **S**). In order to facilitate the reader to identify the most relevant entries for the topic of impacts and measurement we used the same colours as above. The references corresponding to each entry in the table are available at the end of this Annex.

Table 2 Main Focus of Surveyed eGovernment Reports

Study	Focus of reports (M =main, S= supplementary)				
	e-readiness	Supply side (online availability of services)	Demand side (take up)	Effects/ impacts	
				(A) Only discussion of impacts	(A) + measurement indicators
1. Accenture (2004)		M			
2. Accenture (2005)			M	S	S
3. Bartelsmann Foundation (2001).	M	M			
4. Birch(2003)	M			S	
5. BISER (2002)	M		M		
6. Booz Allen Hamilton (2002)	M	S			S
7. Burgess & Houghton (2002)		M			
8. Cap Gemini - TNO (2004)		M	M	S	
9. Cap Gemini E&Young (2004)		M			
10. Cisco (2004)		S		M	
11. COMNET-IT (2000)	M	M			
12. Cullen and Houghton (2000)		M	M		
13. Danish Digital Task Force (2004)					M
14. Deloitte (2003a)				M	
15. Deloitte (2003b)			M	M	
16. DeMaio, ed. (2002)					M
17. Demchak <i>et al.</i> (2000)		M			
18. Dexter and Parr (2003)	S		M		
19. Dutch Government (2006)					M
20. Dutch Ministry of Interior and Kingdom Relations (2005)					M
21. Dutch Ministry of Finance (2005)					M
22. Dutta <i>et al.</i> (2004)	M				
23. EOS Gallup (2002)	M		S		
24. Erin (2003)			M		
25. French Agency for Electronic Administration (ADAE 2005)					M
26. German Federal Ministry of Interior IT Dept (2005)					M
27. Foley and Ghani (2004)		M	M	M	S
28. Gant and Gant (2002)		M			
29. Gartner (2003)				S	
30. GSA (2003)			M	M	
31. Hart-Teeter (2003)		M	M		
32. IDA (2003)			S		M
33. IDABC (2005)				M	
34. Kaylor <i>et al.</i> (2001)		M			

Continues

Table 2 Main Focus of eGovernment Reports (continued)

Study	Focus of reports (M =main, S= supplementary)				
	e-readiness	Supply side (online availability of services)	Demand side (take up)	Effects/ impacts	
				(A) Only discussion of impacts	(A) + Some measurement indicators
35. KEeLAN (2002)		M			
36. Millard <i>et al.</i> (2004)		M		S	
37. Momentum (2000)	M		M		
38. Muyllé et al. (2004)			M		
39. NACO (2000)	M	S			
40. NAO (2002)	S	M			
41. Navarro & Canavante (2004)		M			
42. NOIE (2001)		M			
43. NOIE&DMR (2003)	S	M	M	M	S
44. Nordic Council (2003)	M	M			
45. PLS Ramboll and Eworx		S	M	S	
46. PLS Ramboll and Eworx		S	M		
47. PTI and ICMA (2001).	M	M			
48. REGIONAL-IST (2003)	M	M	S		
49. SIBIS (2003)	M		M		
50. Smith (2001)		M			
51. SOCITIM (2004)		M			
52. Stowers (2004)					M
53. Stover & Straubhaar (2000)	M		M		
54. The Henley Center (2000).	M		M		
55. TietoEnator (2001)		M			
56. TBS of Canada (2004)					M
57. UK Criminal Justice IT (UK CJIT 2005)					M
58. UK Cabinet Office eGovernment Unit (UK eGU 2005)					M
59. UK OGC (2003)					M
60. UN (2003)	M	M			
61. US Chief Information Office				M	S
62. West (2003a)		M			
63. West (2004b)		M			
64. West (2003c)		M			

Source: See list of Reference at paragraph 2.8.

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2.5. Selected Running Methodologies: Comparative Analysis

Below we focus in some details on five EU national methodologies (Denmark, France, Germany, and UK) and on a departmental one (UK Criminal Justice IT), for which Table 3 in next page summarise the conceptualisation of major targets of measurement. We also briefly refer to examples from outside the EU as a term of comparison. Finally we also consider a more specific methodology recently released by the Dutch Ministry of Interior and Kingdom Relation and aimed at measuring eGovernment contribution to the reduction of administrative burden on citizens and businesses.

The goal is to identify the various area of benefits/impacts considered and their components and to pinpoint differences and commonalities. This work has been instrumental to the operational declination of the components of the measurement framework analytical model and to the objective to include in it elements that are widely used internationally so to maximise the chances of finding basic common grounds that EU Member States can agree upon.

If we only look at Table 3, limited to the higher level of conceptual abstraction in the five methodologies considered, there appears to be a substantial level of difference among them. Such divergence is confirmed also by looking at the tables reported in paragraph 2.6 for Australia, Canada and USA. On the other hand if we go down in the level of abstraction and consider the elements included under each higher level heading, although differences remain, a relevant number of common elements emerge.

The differences in the higher level of conceptualisation partly reflect simply different terminological choices, and partly the different administrative context and the different objectives shaping and inspiring the various methodologies.

For instance, the general category defined as "Necessity" in the French methodology "Mareva"⁴⁷ and "Urgency" in the German methodology "WiBe 4.0"⁴⁸ actually include mostly similar items. In both cases, for instance, the compliance with regulatory framework is cited as an element of 'necessity' or 'urgency' of a project. Regardless of the internal efficiency benefits and of the external effects of a given project, the items under the two categories "necessity" (French case) and "urgency" (German case) aim to measure how such project contribute to the achievement of outcomes that are considered compulsory either from an internal or from an external perspective. So Mareva includes under "necessity" the qualitative measurement of how a given project contributes to the necessities of the National eGovernment Programme ADELE (infrastructures, horizontal projects), to regulatory obligations or the political commitment, to the rationalisation of public action in general. In a similar way "WiBe 4.0" include under "urgency" qualitative indicators of how a given project contributes to "flexibility and inter-operability" of an IT system, to compliance with regulatory requirements, to overall efficiency of the public sector as a whole and clearly states that the monetary quantification of these item is usually not possible but that they 'have a significant influence on economic efficiency in a broader sense'⁴⁹.

In the French case the distinction between the categories "profitability for the state" and "Internalities for Public Administration", partly reflects the distinction between benefits that are quantified in monetary terms and those that are assessed on a four point qualitative scale, partly the peculiarity of the institutional context. Mareva has been devised as a methodology for eGovernment projects managed and financed at the level of central state institutions.

⁴⁷ Reference N. 25 in table 2

⁴⁸ Reference N. 26 in table 2.

⁴⁹ Reference N. 26 in table 2.

Table 3 Conceptual Categorisation of Measurement Targets in Running Methodologies

Danish 'eGovernment Signposts' (13)	French "MAREVA" Methodology (25)	German "WiBe 4.0" Guidelines (26)	Uk " Business Case" Methodology (58) and (59)
<ul style="list-style-type: none"> • Coherent services with citizens and businesses at the centre • Increase services quality and release resources • Work and communicate digitally • Coherent and flexible ICT infrastructure • Managers ensure that organisations capitalise the vision 	<ul style="list-style-type: none"> • State profitability • Internalities for public sector • Externalities for users • Necessity • Risk 	<ul style="list-style-type: none"> • Monetisable economic efficiency <p>Extended economic efficiency:</p> <ul style="list-style-type: none"> • Qualitative/strategic importance • External Effects • Urgency 	<p>Benefits to Users</p> <ul style="list-style-type: none"> • Monetary <ul style="list-style-type: none"> • Non Monetary • Time saving • Added Value • Urgency <p>Benefits to Govt/Pub. Serv.</p> <ul style="list-style-type: none"> • Direct cash benefits • Monetisable efficiency benefits • Non monetisable benefits

Source: Same as Table 2, the number in parenthesis refers to the list of bibliographic references reported in paragraph 2.8.

Therefore the strictly defined and monetisable efficiency gains are considered benefits for the State budget. On the other hand, to assess the full value of the projects the methodology also considers the benefits that will accrue to other public sector organisations beyond the central ministries running and financing the projects.

Continuing in this comparative overview, regardless of the different headings, we find many commonalities for what concerns impacts related to broadly defined public administration if we have a combined look at the following:

- The items included under the categories "Profitability for the State", "Necessity" and "Internalities for the Public Sector" in the French *Mareva* methodology;
- The items included under the categories "Economic Efficiency in Monetary Sense", "Urgency" and "Qualitative/Strategic Importance" in the German *WiBe 4.0* methodology;
- The items included under the category "Benefits to Government/public services" (and its sub-categories 'direct cash benefits', 'monetisable/ efficiency savings benefits' and 'non monetisable benefits') in the UK *Business Case* methodology;

First of all, all three approaches consider both impacts that are directly cashable or that can be rendered in monetary terms and others that cannot be rendered in monetary terms and that are assessed mostly on a qualitative four point scale. **Therefore it is recognised that there is a quantitative and qualitative side of efficiency gains accruing to public administration as a result of eGovernment.**

⁵⁰ These are direct cash benefits if the redundant staff will be removed from the budget or opportunity benefits given a monetary value in terms of the new activities that can be undertaken due to productivity gains.

Within the **quantitative side of efficiency**, regardless of terminological differences, the commonalities include:

- Gains in Full Time Equivalent of staff as a result of task elimination, reduced processing times, reduced error and need to re-work⁵⁰;
- Cost avoidance as a result of dematerialisation of processes (less paper and prints), economy of scales in using overhead;
- Better and increased revenue collection.

Within the **qualitative side of efficiency** the commonalities include, among others, the following:

- Improved operation of public administration as a result of reorganisation
- Improved support to higher level management and policy making processes as a result of the bottom-up flow of more timely and better information
- Improved working conditions for public sector employees

As a matter of fact this qualitative side can be seen not as strictly efficiency but more broadly as a efficiency-effectiveness mix.

The same comparative operation can be repeated for what concerns **external impacts** if we have a combined look at the following:

- The items included under the category "Externalities for users", in the French **Mareva** methodology;
- The items included under the category "External Effect", in the German **WiBe 4.0** methodology;
- The items included under the category "Benefits to users" (and its sub-categories 'Monetary', 'Non monetary') in the UK **Business Case** methodology;

The three methodologies converge in identifying three basic categories:

- Direct cash saving (avoidance of postage and travel costs)
- Time saved that can be measured in monetary terms (particularly relevant in quantitative terms for businesses)
- Qualitative added value to be measured indirectly by assigning a value to the new functionalities/opportunities provided online or directly through users satisfaction survey

...

On the other hand, the Danish **eGovernment Signposts** methodology⁵¹ does differ substantially from the previous three cases considered for the simple reason that its objectives are different. Indeed this is not a business case methodology but a Key Performance Indicators (KPI) template measuring mostly in volume or qualitatively the immediate outputs of eGovernment projects rather than impacts. Moreover, non monetary quantification is attempted. Despite such difference, still some element of convergence can be identified. First, the category "increase service quality and release resources" include items that can be compared to those identified above as common to the French, German and UK case. Second the KPI "Work and communicate digitally" for public agency can be seen as similar to the impact of improved operational efficiency.

The three non EU cases (Australia, Canada, and USA), whose summary tables can also be found in next paragraph, despite differences, includes most of the elements identified as commonalities of the EU cases and in this way provide a further international validation.

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⁵¹ Reference N. 13 in table 2 and in Annex A.

⁵² Reference # 19 of Table 2.

2.6. Summary Tables of Selected Measurements

Table 4 Danish eGovernment Signposts (Reference 13 in Annex A)

<i>Coherent services with citizens and businesses at the centre</i>	<i>Increase services quality and release resources</i>	<i>Work and communicate digitally</i>	<i>Coherent and flexible ICT infrastructure</i>	<i>Managers ensure that organisations capitalise the vision</i>
<ul style="list-style-type: none"> <input type="checkbox"/> % of the population using public sector's digital services <input type="checkbox"/> % of businesses using public sector's digital services <input type="checkbox"/> % of documents public authorities receive digitally from businesses <input type="checkbox"/> % of documents public authorities receive digitally from citizens <input type="checkbox"/> Use satisfaction with public sector's digital services 	<ul style="list-style-type: none"> <input type="checkbox"/> % of resources released <input type="checkbox"/> Quality of services improvements 	<ul style="list-style-type: none"> <input type="checkbox"/> % of documents public authorities receive digitally from other public authorities <input type="checkbox"/> % of public authorities that can communicate securely with other public authorities using the digital channel <input type="checkbox"/> % of public authorities using electronic case management <input type="checkbox"/> % of public authorities purchasing digitally using digital invoicing 	<ul style="list-style-type: none"> <input type="checkbox"/> % of public authorities indicating lack of common solutions as a significant obstacle <input type="checkbox"/> % of public authorities indicating lack of common standards as a significant obstacle <input type="checkbox"/> % of public authorities indicating lack of suitably adapted legislation as a significant obstacle <input type="checkbox"/> % of public authorities having an IT strategy addressing service levels, security and infrastructure issues <input type="checkbox"/> Number of digital signatures certificates distributed 	<ul style="list-style-type: none"> <input type="checkbox"/> % of public authorities indicating lack of political will as a significant obstacle <input type="checkbox"/> % of public authorities indicating lack of allocation of resources as a significant obstacle <input type="checkbox"/> % of public authorities indicating lack of common solutions as a significant obstacle <input type="checkbox"/> % of digital project producing a simplification of working practices

Table 5 French Mareva Methodology (Reference 24 in Annex A)

<i>Profitability for the State</i>	<i>Internalities for Public Administration</i>	<i>Externalities for users</i>	<i>Necessity of the project</i>	<i>Risk of the project</i>
<p><u>Productivity gain: more FTE</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Tasks elimination <input type="checkbox"/> Ergonomics improvement <input type="checkbox"/> Faster search: database <p><u>Efficiency gains:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Reduction of errors <input type="checkbox"/> Optimised receipt of documents <input type="checkbox"/> Improved decision-making <p><u>Accruing economies:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Avoided costs <input type="checkbox"/> Economies of scale <p><u>Faster revenue collection</u></p> <p><u>Increased revenues</u></p>	<p><u>Better work place for PS employees:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Job content improvement <input type="checkbox"/> Working conditions improvement <p><u>Improved efficiency of public services:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Support re-organisation <input type="checkbox"/> Improved planning <input type="checkbox"/> Improved and faster decision-making <input type="checkbox"/> Elimination of paper archives <p><u>Support to decentralisation:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Empowerment of local comm. <input type="checkbox"/> Mutualised infrastructures for communities 	<p><u>Quality improvements:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Simpler services <input type="checkbox"/> Personalisation <input type="checkbox"/> New integrated services <input type="checkbox"/> Multichannel delivery <p><u>Information society promotion:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Benefits for work <input type="checkbox"/> Benefits for civic life <input type="checkbox"/> Benefits ICT skills <input type="checkbox"/> Benefits of groups at risk <input type="checkbox"/> Benefits for social cohesion <input type="checkbox"/> Benefits to democratic participation <p><u>Number of users affected</u></p> <p><u>Time/money saved</u></p>	<p><u>Necessity for Adele:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Cross infrastructures for Adele <input type="checkbox"/> Cross project refer system <p><u>External necessity:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Respond to regulatory requirement <input type="checkbox"/> Respond to political obligation <p><u>Public service efficiency necessity:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Avoid other expenses <input type="checkbox"/> Simplify complex area <input type="checkbox"/> Control/avoid risky/uncertain area 	<p><u>Project Risk</u></p> <p><u>Technical Risk</u></p> <p><u>Legal Risk</u></p> <p><u>Deployment risk</u></p>

Economic efficiency in monetary Sense	Extended Economic Efficiency (non monetary sense)		
	Qualitative/strategic importance	External Effects	Urgency
<p><u>Once off develop. savings:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Avoidance of cost for maintaining/upgrading old IT system <p><u>Once off revenues (sale of old system)</u></p> <p><u>Operating Savings</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> FTE savings produced by new work processes 	<p><u>Priority of IT Measure</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> IT frame work strategy <input type="checkbox"/> integration with Federal IT sys. <input type="checkbox"/> Manufacturer independence <p><u>Increased quality of dedicated tasks:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Improved job performances <input type="checkbox"/> Acceleration of work processes <input type="checkbox"/> Standardised administrative work <input type="checkbox"/> Improved image of administration <p><u>Administrative/Political level info control:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Provision of info to decision-makers and/or controllers <input type="checkbox"/> Support to decision making / leadership tasks <p><u>Staff-related effects:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Attractiveness of working conditions <input type="checkbox"/> Ensuring/expanding qualifications 	<p><u>Urgency due to demand intensity</u></p> <p><u>User friendliness:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Uniform standardise access <input type="checkbox"/> More understandable and reproducible services <input type="checkbox"/> Customer support functions <input type="checkbox"/> Timely availability of information <p><u>External economic effects:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Saved money for postage, paper, travel <input type="checkbox"/> Saved time <input type="checkbox"/> Avoidance of misinvestments <input type="checkbox"/> Increased productivity for businesses due to reduced process and administrative costs <p><u>Improved quality and performance:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Follow-up effect for commercial partners, i.e. interoperability <input type="checkbox"/> External effect of acceleration of administrative procedures <input type="checkbox"/> Improved multi-agency cooperation <input type="checkbox"/> Extension of services offered 	<p><u>Urgency to replace old system</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> System continuity <input type="checkbox"/> Logistic/capacities aspects <input type="checkbox"/> System stability <input type="checkbox"/> System flexibility, inter-operability <p><u>Compliance with regulatory requirements:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Laws <input type="checkbox"/> Data protection/security <input type="checkbox"/> Correct procedures and work processes <p><u>Public service efficiency necessity:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Avoid other expenses <input type="checkbox"/> Simplify complex area <input type="checkbox"/> Control/avoid risky/uncertain area
<p>Note/Correction: WiBe Operating Savings cover 16 criteria, FTE savings is just one of them</p>			

Table 6 German WiBe 4.0 Methodology (Reference 25 in Annex A)

Table 7 UK Business Model Methodology (References 57 and 58 in Annex A)

Benefits to users			Benefits to Government/public service			Benefits to society/ Nation	
Monetary	Non monetary		Direct cash benefits	Monetisable / Efficiency savings benefits	Non monetisable benefits	Monetisable / Efficiency savings benefits	Non monetisable benefits
	Time saving	Value added					
<ul style="list-style-type: none"> <input type="checkbox"/> Avoided postage costs <input type="checkbox"/> Avoided transport costs 	<p><u>Accessibility</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Time saved from single online access point <p><u>Convenience</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Less time for travelling to physical locations <p><u>Facile delivery</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> pre-population of e-forms <input type="checkbox"/> online tax return (error free) 	<p><u>Functionality</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Better search enquiries <input type="checkbox"/> Immediate confirm of processing <p><u>Accessibility</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Monitor, access and change data held by govt <p><u>Convenience</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> 24/7 	<ul style="list-style-type: none"> <input type="checkbox"/> Greater tax collection / revenue <input type="checkbox"/> Reduced fraud <input type="checkbox"/> Reduced travel costs / field force expenditure <input type="checkbox"/> Reduced publication & distribution costs <input type="checkbox"/> Lower fines to UK government from EU / other international body <input type="checkbox"/> Additional revenue from greater take-up / usage of commercial services / data offered (e.g. use of electoral roll data) <input type="checkbox"/> Additional revenue from newly available services / newly charged for services <input type="checkbox"/> Reduced need for benefits - e.g. through faster job searches 	<p><u>Time savings</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Reduced processing <input type="checkbox"/> Time saving of public servants <input type="checkbox"/> Reduced error / re-work / complaints <input type="checkbox"/> Reduced multiple data collections from single customers <input type="checkbox"/> Enabled flexible working hours <p><u>Information benefits</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> More accurate information <input type="checkbox"/> More info-sharing capacity <p><u>Risk benefits</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Improved risk management <input type="checkbox"/> Improved security <p><u>Future cost avoidance</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Lower future costs through shared infrastructure <input type="checkbox"/> Reduced demand for service <input type="checkbox"/> Reduced need for government expansion <p><u>Resource efficiency</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Reduced redundancy through integrated systems <input type="checkbox"/> More effective use of existing (e and non-e) infrastructure / reduced capacity wastage 	<p><u>Improved Service Delivery</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Greater take-up of entitlements <input type="checkbox"/> Improved user Satisfaction o Improved Communication <input type="checkbox"/> Improved Reputation / increase user trust & confidence <input type="checkbox"/> Enhanced Customer Service o Improved service consistency and equality <input type="checkbox"/> Integrated view of customer <p><u>Enhancements to policy process</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Enhanced policy alignment & outcomes <input type="checkbox"/> Better information to facilitate policy making <p><u>Enhancements to democracy</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Increased user involvement / participation / contribution <p><u>Allows more / greater / new data to be collected</u></p> <p><u>Improved health and safety standards (e.g. farms)</u></p> <p><u>Improved Security</u></p>	<ul style="list-style-type: none"> <input type="checkbox"/> More effective use of existing infrastructure <input type="checkbox"/> Greater educational participation / retention / achievement <input type="checkbox"/> Encourage socially / environmentally desirable behaviour (e.g. shift from road to public transport) <input type="checkbox"/> Reduced regulatory burden / paperwork -> Economic development <input type="checkbox"/> Stimulation of specific industry / sector 	<ul style="list-style-type: none"> <input type="checkbox"/> More effective use of existing infrastructure <input type="checkbox"/> Improved Health <input type="checkbox"/> Greater take-up of entitlements <input type="checkbox"/> Enhanced democracy - increased user involvement / participation / contribution <input type="checkbox"/> Greater Fairness & equality <input type="checkbox"/> Leadership in digital economy <input type="checkbox"/> Increased citizen well-being

¹ Quicker and easier conduct of business with government, Reduction in employees' time spent on administrative processes. This is the equivalent of administrative burden reduction of businesses

Table 8 UK CJIT Methodology Applied to Secure e-Mail Project (Reference 56 in Annex A)

Performance Benefits	People Benefits	Financial Benefits ²
<input type="checkbox"/> Contribution to achievement of PSA targets <input type="checkbox"/> Contribution to achievement of CJS objectives <input type="checkbox"/> Contribution to achieving the Justice for all vision	<u>CJO Practitioners</u> <input type="checkbox"/> Improved working conditions <input type="checkbox"/> Improve job administration <input type="checkbox"/> Improve job accountability and flexibility <u>Management</u> <input type="checkbox"/> Improved monitoring of performance <input type="checkbox"/> Better communication <input type="checkbox"/> Promotion of joined-up work with other organisation <u>CJP</u> <input type="checkbox"/> Improved communication within CJP network <input type="checkbox"/> Improved communication with CJO	<u>Efficiency¹</u> <input type="checkbox"/> Reduced staff time ³ <input type="checkbox"/> Reduced printing, photocopying and transmission (fax, postage, courier) costs. <u>Effectiveness⁴</u> <input type="checkbox"/> Avoidable Magistrates Court Adjournment <input type="checkbox"/> Un-necessary Police attendance at Magistrates Court <input type="checkbox"/> Un-necessary Police attendance at Crown Court <input type="checkbox"/> Un-necessary non Police attendance at Magistrates Court <input type="checkbox"/> Un-necessary non Police attendance at Crown Court <input type="checkbox"/> Offender self harm/ harm to others <input type="checkbox"/> Magistrates' Court - Ineffective trials <input type="checkbox"/> Crown Court - Ineffective trials <input type="checkbox"/> Magistrates' Court - Cracked trials <input type="checkbox"/> Crown Court - Cracked trials <input type="checkbox"/> Inappropriate time in custody

¹ Distinguished into 'cashable benefits' and 'opportunity value benefits'. **Cashable** = Benefits which enable current output to be delivered at lower cost. This also includes the additional costs of a policy decision that are avoided due to resource savings being achieved elsewhere (e.g. productivity savings which enable staff to be re-deployed, thereby removing the need to recruit new staff). **Opportunity value** = The value of activities that can be undertaken due to productivity improvements that would otherwise not have been undertaken or which would have been completed to a lower standard of quality.

Financial efficiency benefits = The savings in staff time, equipment costs, etc. arising from IT-enabled business change.

² Time spent printing, photocopying and transmitting (fax, mail, courier) documents, leading to reduced staff administration costs (realisable by reducing recruitment and use of temps, or redistribution of resources).

³ **Financial effectiveness benefits** = The monetary value assigned to performance benefits. They are estimated using a "Root Cause Model" which calculate how the project impact on the reduction of key problems in the Criminal Justice System.

Table 9 Australian NOIE Methodology (Reference 42 in Annex A)

Agency benefits	Consumer financial benefits	Social benefits	Contribution to broader government objectives
<input type="checkbox"/> Direct reduction of costs (advertisement, printing, staff costs) <input type="checkbox"/> Cost reduction through improved business processes <input type="checkbox"/> Reduced cost from economy of scale by cross-agency cooperation	<input type="checkbox"/> Lower cost of transactions for citizens <input type="checkbox"/> Lower cost of transactions for businesses <input type="checkbox"/> Improved business opportunities <input type="checkbox"/> Improved job opportunities	<input type="checkbox"/> Better information and access to health opportunities <input type="checkbox"/> Better information and access to educational opportunities <input type="checkbox"/> Better information and access to social benefits <input type="checkbox"/> Improved skills <input type="checkbox"/> Better communities skills and knowledge	<input type="checkbox"/> Labour market efficiencies <input type="checkbox"/> Better supply management <input type="checkbox"/> Increased Transparency and accountability <input type="checkbox"/> Increased Participation

Table 10 Canada GOL Performance Measurement (Reference 55 in Annex A)

Categories	Indicators		
Convenience	"no wrong door" approach	Web sites easy to identify and navigate	Information and services focused on user perspective
Accessibility	Information and services accessible to persons with disabilities	Information and services are available in both official languages	
Credibility	Accurate, authoritative, up-to-date, relevant information	Trustworthy information that makes sense to users	
Critical Mass of services	Most commonly used information and services on-line with increasing depth	Electronic delivery channel for all new federal services	
Security	Use of the common infrastructure	Adequate steps by departments and agencies to ensure that transactions are secure	Citizens/clients perceive that on-line services are secure
Privacy	Adequate steps to protect personal information/individual privacy on-line	Citizens/clients perceive that on-line services offer good privacy protection	
Service transformation	Rethinking of business processes & use of shared or common solutions	Inter-institutional cooperation to provide integrated service delivery	
Client take-up	Citizens/clients know what is available on-line	Take-up of e-channel increases over time	
Client satisfaction	Increased satisfaction levels through high quality services that provide clients time, effort, and cost savings relative to other delivery channels	Robust and accurate citizen/client feedback drives the improvement and evolution of services	
Efficiency	Return on investment (ROI)	Cost avoidance,	Operational efficiencies
Innovation	Use and demonstration of innovative Internet applications	Establishment of Canada as a leader in the knowledge-based economy and society	
Overall Objective: To make Canada a Leader in the Use of Innovative ICTs as the "back-bone" for engaging citizens, and for improving the effectiveness of federal programs and their delivery			

- = short-term outcomes
- = medium-term outcomes
- = end outcomes

Table 11 US GSA Methodology (Reference 29 in Annex A)

Financial benefits	Economic Development benefits	Reduced redundancy benefits	Fostering democratic principles	Improved service to citizens and other constituencies
<p><u>Reduced costs of government operations:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> staffing requirements <input type="checkbox"/> paperwork <input type="checkbox"/> printing and mailing costs <input type="checkbox"/> cycle time <input type="checkbox"/> check processing <input type="checkbox"/> document storage <input type="checkbox"/> telephone calls <input type="checkbox"/> visits to field offices <p><u>Enhanced revenue collection:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> bring in revenue through convenience fees that cover the costs of conducting transactions online <input type="checkbox"/> cash management savings derived from prompt payment of fines, fees and taxes, <input type="checkbox"/> vendor fees that pay for the cost of online government procurement programs 	<p><u>Reduced administrative burden for businesses</u></p> <p><u>Better information and access to opportunities for businesses</u></p> <p><u>Online territorial marketing</u></p>	<p><u>Consolidation and integration of government IT system</u></p> <p><u>Back-office redesign and integration</u></p> <p><u>High quality, multi-channel, user-centric service provision to citizens</u></p>	<p><u>Participation</u></p> <p><u>Transparency</u></p> <p><u>Accountability</u></p>	<p><u>User Satisfaction</u></p> <p><u>Time saved</u></p> <p><u>Money Saved</u></p>

2.7. Lessons Learnt from the state of the art review

Measuring in general the performance and output of the public sector is a challenging task ahead of most EU Member States. The difficulties derive from the lack of pricing mechanisms, from the necessity for public agency to ensure multi-constituent delivery with different goals, from the complexities of cross-agency contribution to final delivery...

... Moreover, for eGovernment measurement most of the necessary data will have to be constructed and gathered from scratch, since there are very few already compiled official statistics that can be used to measure the more short term and intermediate impacts. Record keeping data, integrated with internal review, will have to be used to produce differential analysis to compare work process costs of traditional service delivery with those online delivery to quantify the efficiency gains produced by the latter. Through internal expert assessment, focus groups and surveys with users (citizens and business) an estimate of the monetary and time savings provided to citizen and businesses through online service delivery will have to be constructed along the lines used by the new Dutch Monitor methodology. The quality of services and users' satisfaction will require the elaboration of appropriate surveys and the construction of indexes. As a result of consultation and collaboration between the central government structures in charge of national eGovernment programs and the managers of eGovernment projects qualitative point scales will have to be agreed upon to measure through self assessment the more qualitative sides of both efficiency and effectiveness.

...

... some EU Member States have defined measuring methodologies and are actively employing them to various projects. In France, just to mention one case, after the quite comprehensive and sophisticated **Mareva** methodology has been unveiled in March 2005, it has been already applied to 40 of the eGovernment projects foreseen in the national programme ADELE and should be applied to all other projects. In the UK, besides the impressive work done on business cases by the Cabinet Office eGovernment Unit, we had the occasion during our field mission to analyse the impressive work done by the Criminal Justice Information Technology (CJIT) in constructing and monitoring very detailed business cases for about 10 projects in a very complex extended system context with benefits measured for a wide variety of internal and external stakeholders (internal employees, prosecutors, judges, lawyers, polices, victims, witnesses, etc). In Germany the **WiBe 4.0** methodology is in full operation and being applied widely.

... some common grounds can be found among the currently running measurement methodologies considered... First of all, the **recognition that measurement must follow a binary approach taking into account both quantitative (directly cashable or monetisable) and qualitative aspects (non monetisable) benefits**. Second, regardless of terminological differences, a convergence emerge on several items that are also used in other methodologies running in countries outside the EU.

2.8. List of References to Table A.1

...

3. Indicators Data Sources

3.1. General Overview

As discussed, for the measurement of eGovernment impacts practically there are no ready made compiled statistics to be used. For the indicators included in the measurement framework the corresponding data will have to be gathered and in some cases 'constructed' from a variety of sources...

...

... we can reasonably conclude that the possible sources of data are the following:

- ▶ Data from administrative records, for instance on:
 - Personnel costs by category;
 - Standard processing time for an end-to-end traditional service provision;
 - Other n on personnel costs for traditional service delivery (paper, printing, postage,
 - Full start up and operational costs of eGovernment applications;
- ▶ Web metrics, for instance on:
 - Number of hits or user contact sessions;
 - Number of document downloads;
 - Amount of time users spend on a site;
 - Number of transactions completed;
 - web analytics (click streams, repeat use, cross-usage);
- ▶ Users satisfaction data, for instance from:
 - Traditional random sample surveys;
 - pop-up surveys;
 - qualitative focus group work;
 - one-on-one accompanied browsing (usability data);
- ▶ Third party assessment of only services functional quality and of level of transparency as determined by the amount of information about the internal functioning of a public administration that is available online and/or by the existence of online case tracking functionalitis
- ▶ Assessment of qualitative impacts internal to public administrations, for instance from:
 - External Expert Audit;
 - Internal Assessment through surveys of relevant managers and supervisors;
 - Employees' Surveys;
- ▶ Official statistics on parameters needed to calculate opportunity values produced for third parties (citizens, businesses, other public organisations):

These sources of data in most cases do not directly provide a measure of impacts, but require further elaboration to construct the relevant data.

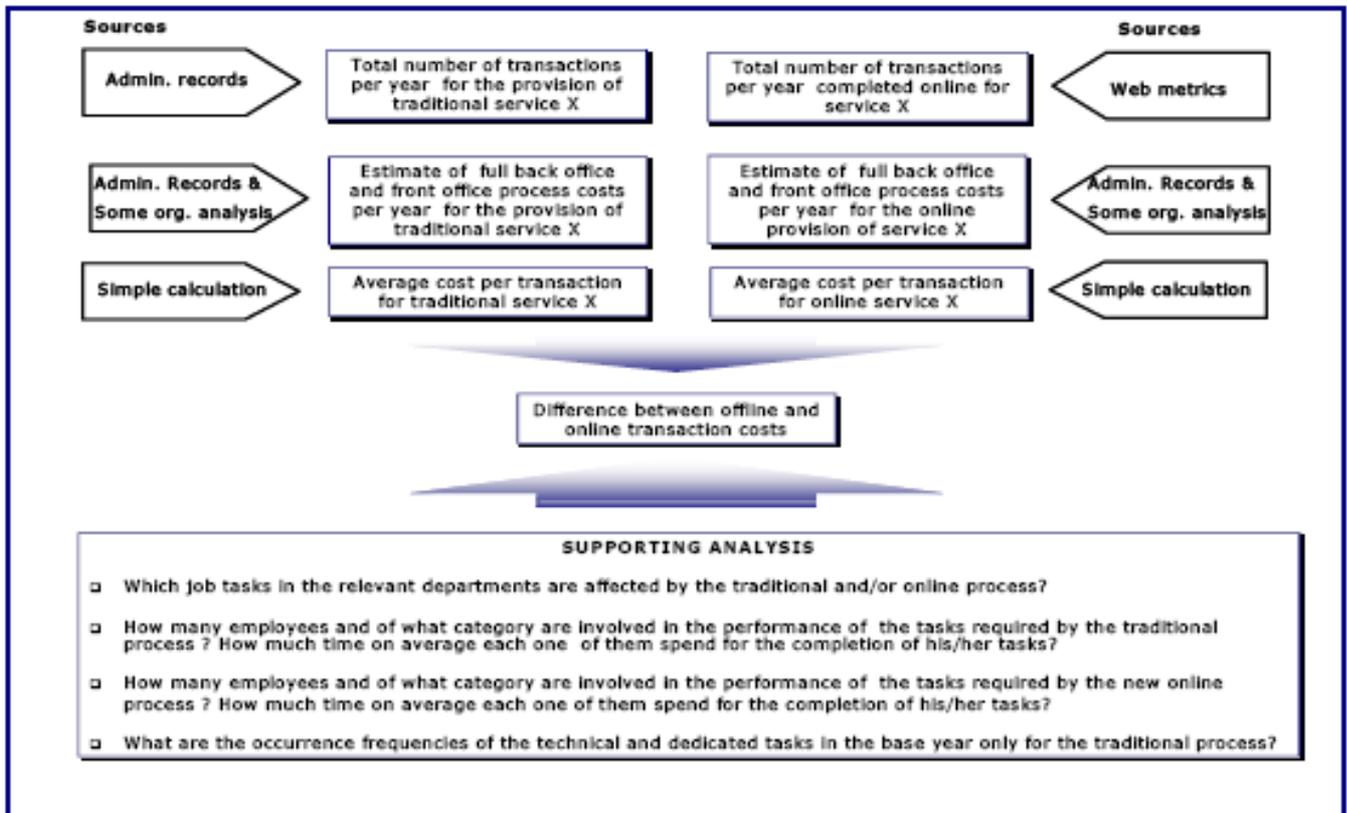
First of all, the measurement of the most tangible financial gains usually requires a differential analysis of material and process costs (in terms of time) between a 'zero-measurement' base line and the operations of a given eGovernment service. In most of the reviewed cases this is done through a comparison of material and process costs entailed in the traditional provision of service with Internet based material and process costs.

Exhibit 6 below illustrates the basic steps and source of data necessary to calculate the gains of reduced process/transaction costs. This calculation process is based on the concept of transaction understood extensively in two ways. First, because the calculation of the cost of transaction actually entails a full analysis and computation of the process costs entailed for its realisation on the side of the public administration. Second, because the term 'transaction' is intended broadly to include all forms of provision of services by public administrations (including thus also one ways flows) and not only transaction in a strict sense (bi-directional exchange, usually with a transfer of money).

The difference between the offline and online overall costs of transactions, if positive, gives the monetary value of the efficiency gains in terms of "Full Time Equivalent of Staff". They can result from task elimination, reduced processing times, reduced error and need to re-work, or from any combination of them. Clearly the monetisation of this gain is produced using time calculations and the wage of the different categories of employees involved in the processes.

The value thus calculated is a direct cash benefit if the staff made redundant is removed from the budget of the public agency. Otherwise is an opportunity value and gives a measure of new/alternative activities that can be undertaken as a result of the time freed. In the middle term this same benefit can become an avoided cost in terms of the decrease of the need to hire new staff. In short this type of calculation looks at savings of personnel costs or gains in FTE in conjunction with the use of the eGovernment applications and thus requires the analysis of all personnel costs incurred as a result the provision of a service only through the old offline process and which becomes partially obsolete due to the introduction of the online based process. This means that the entire yearly working time related, in all business units, to the old process must be determined.

Exhibit 6 Calculating Process/Transaction Efficiency Gains



The calculation of cashable benefits in term of avoided material costs is more intuitive and straightforward ...

Also quite simple is the calculation of benefits in terms of the cost avoided as a result of economy of scale in the use of overall capacity, and particularly with regard to the use of ICT for horizontal infrastructure eGovernment project whose impacts trickle down to several public administrations...

...

Despite national differences, most governments for the sake of public interests require citizens and business to refrain from certain conduct and to enact others, this amount to so called 'content obligations'. Governments also requires citizens and businesses to provide information on actions and conduct that amount to 'information obligations'. Administrative burden is defined only in terms of the 'information obligations' as follows: ***the costs for citizens and businesses of complying with information obligations deriving by legislation and regulation imposed by the government.***

Using the Standard Cost Model the indicator of the **total Administrative Burden (AB)** can be calculated as follows:

$$AB = T * Q * F * P$$

Where:

T= time spent on information obligations;

Q= number of citizens / businesses;

F = yearly frequency of complying with information

obligations P = Tariff per hour (only for businesses)

While the quantification in monetary terms for businesses is quite straightforward and can use standard market data on wages for the type of employees dealing with information obligation within businesses, for citizens is more problematic since it is difficult to come up with an average monetary value of the time saved that would fit all the possible different social positions. Therefore the AB burden for citizens is usually expressed in terms of the total amount of hours saved, integrated with an estimation of the avoided cost of travel and postage.

Naturally the calculation of the AB and of its reduction due to the introduction of online services require some analysis and estimations. At the level of single public agencies or of a vertical public administration sector a base line of AB must be established. This requires:

1. The identification of all type of information obligations imposed on citizens / businesses
2. An estimation of the time and other costs that citizens / businesses bear to comply with them (this can be done on the basis of internal analysis possibly integrated with focus groups and/or surveys with users)
3. An estimation of the time the administration takes to process the information and return to citizens / businesses the need certification/permits/ license (where this applies)
4. An estimation of the occurrence of errors that will require citizens / businesses to spend more time complying with the obligations

The reduction impact yielded by the online handling of such information obligations will then be calculated as a reduction of the time and costs needed for items 2-4.

In this calculation it is assumed that, regardless of whether or not the information obligations have been simplified by changes in the legislation and regulation, the use of the digital channels produces time savings and reduction of material costs as a result of its peculiarities. Among the possible contribution of AB reduction typically associated to online delivery we can cite, among others, the following:

- Online pre-populated forms reducing the time of complying with information obligations and drastically eliminating errors and the subsequent need of re-work;
- Convenience, costs avoided (travel and postage) and time saved avoiding standing in line;
- On-off provision of data;
- Electronic authentication.

So far in the discussion the sources of data considered have been mainly internal administrative records complemented by analysis and estimation and external official statistics for standard market parameters to be used in such estimation. Actually web metrics have also been cited as the source of data on the number of transaction completed online.

Since web metrics and users satisfaction data will be discussed in next paragraph dedicated to the issue of perceived quality and users satisfaction, in the reminding of this paragraph we briefly consider the qualitative based measurement of impacts that are internal to the functioning of public administration and that cannot be rendered in any monetary and/or quantitative way. These are impacts, however, that are extremely important and that are worth being accounted for, even if only in qualitative terms.

The best way to introduce this source of measurement is to give an example of how this is done in the German measurement methodology WiBe 4.055. This methodology foresees one quantitative dimension defined "Economic efficiency in monetary sense" where benefits are quantified in ways similar to those describe earlier for FTE gains and avoided costs. In addition there are three other areas of benefits ("Urgency", "Qualitative and Strategic Importance", "External Effects"), all of which are assessed using a qualitative scale.

Exhibit 8 below report from WiBe 4.0 the example for the item "improved job performance" included under the category of "Qualitative / Strategic Importance". This sort of assessment is based on a qualitative scale and is applied to all items for all the three categories mentioned above that are measured only qualitatively.

The type of scale used has been studied by the eGovernment Federal Agency, in collaboration with the most important actors involved in the implementation of eGovernment services. The assessment using this scale is conducted internally by managers and experts involved in each project using the methodological guide provided by the Federal Agency for eGovernment, an introductory explanation and/or definition of the criterion is followed by a table with the scale which assigns a score for implementation. This process, however, also requires a discussion between project managers and representatives of the Federal Agency for eGovernment, especially for the assignment of weights to the score of each item. The overall qualitative assessment of the impact of a project is determined by the project managers with the collaboration of the Federal Agency for eGovernment and is carried out in two separate steps as follows:

1. Justification of the score on the scale of 10 awarded to every single criterion. A criterion which is not relevant for the project receives "0" points;
2. Ponderation of the intermediate result by multiplying the score of each criterion by its weight,

A similar solution is adopted also in the French Mareva methodology for a number of qualitative impacts internal to the public sector or relevant for the system as a whole, as well as in the Canadian Government Online Methodology (GOL) where a number of intermediate outcomes are measure through internal qualitative self-assessment.

Naturally in this approach a number of issues remain blurred and open to different choices, depending on both political priorities and technical perspectives, such as for instance the following:

- Which impacts cannot be measured quantitatively and must be assessed qualitatively;
- Which potential qualitative impacts are worth assessing;
- The choice of the qualitative scale used;
- The process of filling the qualitative scale (through external auditors, or through internal personnel, and this case how extensive should be the panel of experts to participate in the assessment).

To a large extent these choices will depend on national priorities, as well as on feasibility and economic considerations.

Exhibit 8 Qualitative Impact Assessment: German WiBe 4.0 Methodology

This criterion evaluates the qualitative effects related to work, i.e. whether the quality of the work process as such and hence also of the product is improved. Qualitative improvements to be assessed can, for example, be improved transparency of administrative work, simplified internal workflows, as well as elimination of redundant and routine operations. Other examples include more up-to-date, less redundant and more complete information sources as well as a lower error rate thanks to interactive help and user support functions. IT measures can also contribute towards higher quality standards (for example, quality management according to the ISO 9001 standard or according to the EFQM model) of complex processes.

When evaluating this criterion, the effects should be differentiated in terms of formal improvement (the workflow improves itself) and material improvement (the result of the workflow is improved).

4.4.2.1 Improved job performance

0	2	4	6	8	10
Irrelevant or no positive effects, respectively.	Minor improvement of the formal work process.	Medium improvement with regard to the formal work process.	Significant improvement of the formal work process.	Significant improvement of the material work result.	Significant improvement of the formal work process and of the material work result.

Source: Federal Ministry of the Interior (BMI), Department IT2 (KBSt) (2004), *Economic Efficiency Assessment (WiBe) 4.0, op. cit.*, p. 55.

3.2. Some Considerations on Service Quality and Users Satisfaction

The basic and straightforward source of difficulty in measuring public outputs resides in the lack of market prices and mechanisms that can be used to value them. Actually it is not only a problem of giving a value to an output, but also of understanding how the output is received and evaluated by the end users, that is to say of including in the measurement also the quality dimension. As reported earlier, the cited Eurostat *Handbook* proposes three ways to adjust for quality⁵⁷:

1. Direct measurement of the quality of the output through a survey of the general public on the quality of public services;
2. Using the quality of the inputs and assuming that the quality change of the inputs leads automatically to a quality change of the output;
3. Using outcomes to measure the quality of the output.

The second alternative seems practical but is in the end tautological since its basic assumption cannot be verified without actually measuring the quality of the output. Therefore we discard it without further analysis.

The first and third alternatives are both viable and actually used with respect to eGovernment, although in both cases there are some complexities / limitations. Users surveys, as illustrated later, have to take into account the effects of expectations and preconceived judgments on public sectors on the side of users, as well as addressing measurement errors related to sampling techniques. The use of the outcomes, that is the produced benefits (i.e. time and cost saved), as objective indicators of improved quality rest on the assumption that such benefits automatically translate into users satisfaction and risk to overlook other more intangible sides of quality that users might consider important.

3.2.1. Selective overview

...

Top of the web surveys. In 2003⁶⁴ and 2004⁶⁵ PLS RAMBOLL Management A/S and EWORX S.A realised by for the DG Information Society of the EU Commission the two *Top of the Web Surveys* on users of public websites providing public e-services to investigate the perceived quality and users satisfaction. They have both been conducted using the pop-up survey methodology ("pop-up" questionnaire activated by the users via link on the website).

⁶⁴ PLS RAMBOLL and EWORX (2003). Top of the Web Survey on Quality and Usage of Public e-Services. European Commission DG Information Society, (<http://www.topoftheweb.net>, accessed October 2004).

⁶⁵ PLS RAMBOLL and EWORX (2004). Top of the Web Survey on Quality and Usage of Public e-Services, European Commission DG Information Society and Media (http://europa.eu.int/information_society/activities/egovernment_research/doc/top_of_the_web_report_2004.pdf, accessed February 2005).

In the course of the 2004 survey a total of 48,228 users (9,896 citizens and 28,332 businesses) answered the questionnaire and represents the largest survey conducted so far, on how the European users perceive public e-services quality. Its limitation derives from the fact that it is not based on a representative sample, on the other hand the main findings seem robust and replicable and are consistent with the results of the first 2003 survey⁶⁶. Moreover, it gathers evaluation based on actually experience and should therefore avoid the expectations effect.

The objectives of these surveys were to:

- Identify which online public services are currently used by citizens/businesses;
- Analyse the level of quality of on-line public services;
- Gather information about to what extent public services are being used (usage) and whether customer expectations about services' quality are being met.

Three are the issues, reflecting the perceived quality of an online service, measured in the survey:

- Overall evaluation
- Usability
- Perceived benefits

Usability, conceived as the ease with which visitors are able to find and to use a web site, is given great emphasis in the study as *"usability is about effectiveness (the degree to which users are able to complete tasks and achieve the intended goal), efficiency (the resources required by the users to complete tasks and goals) and user satisfaction"*⁶⁷. Five are the usability criteria measured in this survey:

- Is the website easy to find?
- Is the e-service easy to find?
- Is the e-service easy to use?
- Is the language understandable?
- Is the speed of the website satisfactory?

An odds-ratio is calculated for users evaluation, to take a closer look at what satisfied users have experienced. This ratio means how satisfied is the user if his/her expectations are met. The results from survey point out that the easiness of use public e-services is the most important factor and it is related to a 8.6 odds-ratio. This means that it is 8.6 times more likely that the user is satisfied if this aspect is fulfilled, than if it is not.

The benefits measured are:

- Saved time
- Gained flexibility
- Getting more and better information
- Receive better help
- Getting a faster case/reply
- Getting better control over the process
- Save money

Citizens and Business rank these benefits in the same order and for both category of users the most important ones are saved time and gained flexibility, that together represent the value of "going on-line instead in-line"

Canadian Approach. The government of Canada has been for years at the forefront of eGovernment development and, building on the understanding developed on such experience, has adopted a broad service vision that focuses on client-centric delivery reflected in a performance measurement framework that encompasses three main outcomes:

- Citizen /client-centred government, including:
 - Convenience
 - Accessibility
 - Credibility
- Better more responsive service, including:
 - Critical mass of services
 - Take-up
 - Service Transformation
 - Citizen/ Client satisfaction
- capacity for online delivery, including:
 - Security
 - Privacy
 - Efficiency
 - Innovation

While citizen / client satisfaction is only one of the item among those listed above, it is evident that the overall framework is very much oriented toward dimensions relevant for users and for the quality of services. Indeed Canada has developed a Common Measurement Tool (CMT) for measuring client satisfaction⁶⁹. The CMT provides public organizations with a set of standard questions and standard measurement scales for use in surveying their clients. It is a comprehensive collection of potential survey questions that an organization may select from, to custom design a client satisfaction survey that meets its information requirements. The use of standard questions allows the organization to benchmark progress over time and, since questions are standard, organizations can compare results with other organizations within the same business line. To ensure this ability to benchmark performance, several core questions are required for inclusion in all surveys. Designed to provide client feedback to any public organization and ensure that all aspects of client service are considered, the CMT is conceived around five key elements:

⁶⁹ A variety of sources are used to measure users satisfaction that include: a) Omnibus surveys (e.g., EKOS' Information Highway studies, Ipsos-Reid research, NFO) b) Interactive surveys (Citizens First and Taking Care of Business studies, EKOS' Information Highway studies, Ipsos-Reid research, NFO Interactive surveys, TBS GOL Internet Research Panel) as reported in Treasury Board of Canada Secretariat (TBS), (2004), *Performance Measurement, op. cit.*, pp. 19-63.

- Client expectations;
- Perceptions of the service experience;
- Satisfaction levels;
- Levels of importance;
- Priorities for service improvements.

...

3.2.2. Methodological complexities of users surveys

The first complexity entailed in measuring users satisfaction through surveys concerns the issue of expectations in general and of already formed 'predisposition towards government' of those who respond to such surveys. In general the marketing law formulated by Maister⁷⁶ can be applied:

$$\textit{Satisfaction} = \textit{perception} - \textit{expectation}$$

In brief both perception and expectations are influenced by a number of variables that have little to do with the actual level of the quality of the services measured⁷⁷. In this respect Bouckaert and Van de Walle, for instance, warn on the danger of the mechanistic reasoning according to which: increasing the quality of governance will increase satisfaction and trust and, therefore, trust and satisfaction indicators from surveys can be used as proxies for good governance⁷⁸. In fact, the authors explain that the causal relationship between satisfaction and trust can be fruitfully analysed only if the already formed 'predisposition towards government' of those who respond to such survey is controlled for.

⁷² http://www.theacsi.org/press_releases/ACSI%20E-Gov%20Mar.05%20Press%20Release.pdf

⁷³ <http://www1.worldbank.org/publicsector/indicators.htm>.

⁷⁴ <http://rru.worldbank.org/InvestmentClimate/>

⁷⁵ On the other hand, data are still available in the website on recent new European Member States such as Slovenia, Poland, etc.

⁷⁶ Maister, D. "The Psychology of Waiting Lines", in J Czepiel, M. Solomon, and C. Suprenant (eds), *The Service Encounter: Managing Employees-Customer Interaction in Service Business*, Lexington, Lexington Books, 1995.

⁷⁷ As shown, for instance, in a study of dissatisfaction and trust regarding six Flemish public agencies, of which 3 distribute subsidies and 3 levy taxes, not surprisingly they found that, regardless of actual services quality, the former three scored much better than the latter three in citizens attitudes surveys (Kampen, Jarl K., Steven Van de Walle and Geert Bouckaert (2003) "Interpreting soft indicators of performance in the public sector. The impact of the predisposition of citizens towards government.", working paper, Public Management Institute, K.U. Leuven, Belgium, http://soc.kuleuven.be/io/pubpdf/io05060015_egpa.pdf, accessed March 2005).

⁷⁸ Bouckaert, G. and S. Van de Walle "Comparing measures of citizen trust and user satisfaction as indicators of "good governance: difficulties in linking trust and satisfaction indicators", *International Review of Administrative Sciences*, vol.69 (2003), p. 330.

If expectations and pre-formed judgement are not controlled for this weakens the validity of the data as a measure of the actual experience of quality. The effects of perceptions (public bureaucracy is generally bad) and expectations (public bureaucracy should offer more) cannot be taken out from surveys without using relatively sophisticated models⁷⁹ that control for the particular predisposition of respondents toward government and thus produce a reliable measure of users satisfaction with a particular public service. Another alternative is the one followed in the American Customer Satisfaction Index where the directly observable outcomes that are assumed to shape satisfaction are included in the construction of the aggregate score measuring users satisfaction.

Other less complex methodological issues that nonetheless require attention concern so called 'survey errors'. Surveys can present four elements contributing to error:

- a) Insufficient sample size;
- b) Coverage error (the sample does not reflect the target population: e.g. survey on satisfaction with eGovernment services administered to a sample including respondents not possessing a PC);
- c) Measurement error (due to context effect: e.g. survey taken on the quality of public services in concomitance with a recent unpopular decision by government);
- d) Non-response error.

3.2.3. Lessons Learnt

The first lesson that can be derived from the above review is that there are at least four sources of data that can be used to measure perceived quality and users satisfaction, the first is direct and the latter three indirect:

1. Directly asking users through traditional random sample surveys and/or interactive online surveys (at a more explorative stage also focus groups and one-to-one browsing can be used);
2. Taking the tangible and measured gains produced in terms of time saving, cost avoided and flexibility / convenience as observed indirect measures of quality of services improvement produced by eGovernment and assume that they translate into increase in users satisfaction;
3. Using web tracking tool to observe online users behaviour and gain indirect evidence of satisfaction from elective repeated and cross usage of services;
4. Defining basic quality parameters of online services and then performing an experimental web-based assessment through external auditors who will attempt to use the services and register their experience (approach used in the latest Accenture eGovernment study).

The second lesson suggests that traditional random sample users surveys must be designed with care if they are to produce valid data on satisfaction where expectations and pre-formed judgement are controlled for. The ideal solution is the construction of a composite satisfaction index that, as the American eGovernment Customer Satisfaction Index, integrate observed outcomes in the construction of the overall score. The construction of such an index is a considerable task evidently outside of eGEP scope. As a matter of fact recently the European Public Administration Network (EPAN) has started preliminary work for the elaboration of a European eGovernment Users Satisfaction Index.

⁷⁹ See, for instance, the model presented in Kampen *et al.*, op. cit., pp. 3-4.

Third, the *Top of the web* experience indicates that interactive surveys of online users can produce robust and replicable data. Such surveys have the draw back of using self-selected samples and thus reflect the peculiar attitudes and preferences of a the peculiar population consisting of individuals who are connected and use eGovernment services. Such attitudes and preferences might not necessarily reflect those of individuals who are online but do not use Internet intensively or of those who still are not online. On the other hand, they have the advantage of gathering the opinions of respondents who have actually used online public services and therefore are clearly less subject to expectations and pre-formed judgement distortion.

Fourth, *Top of the web* surveys report that for both citizen and businesses the time saved is considered, together with flexibility /convenience of use, as the most important benefit produced by eGovernment services and thus confirm the suitability of using tangible outcomes produced in terms of time savings as an indirect but observable and measurable indicators of quality of services and users satisfaction.

Finally, again from *Top of the web*, we learn the important lesson on the crucial relevance of usability of online public services as contribution to the effectiveness (the degree to which users are able to complete tasks and achieve the intended goal), and efficiency (the resources required by the users to complete tasks and goals) of usage, that considerably determines user satisfaction.

As a result of this review and in line with eGEP overall work and approach we can then propose the following sources-driven decomposition of the quality of services and users satisfaction into three dimensions.

1) **Observable (objective) Tangible Quality Outcomes:**

- Reduction in the number of officially filed complaints;
- Time Saved;
- Flexible usage;
- Users loyalty;

2) **Unobservable (subjective) Intangible Dimensions of Quality:**

- Correspondence of services to users' needs (perceived usefulness of services);
- Perceived accuracy and credibility of information provided;
- Satisfaction on how security and privacy issues are handled;
- Overall users rating of eGovernment services.

3) **Externally Measurable (third party judgement) Functional Dimensions of Quality:**

- Usability;
- Seamless service provision (cross-agency delivered services);
- Innovative service provision;
- Proactive communication and user education/help;

The data for the first dimension can come from administrative records and/or Standard Cost Model calculations, as well as from web metrics. This the objective and most quantifiable dimension. The second dimension concerns instead the subjective perspectives of users and will have to rely on surveys data. Finally the third is an intermediate dimension that can be assessed through external experimentation of online services by a large enough group of external auditors to guarantee a certain level of 'objective inter-subjectivity'. This is somehow similar to the approach followed in the latest Accenture eGovernment study. In our view, however, that to increase the level of inter-subjectivity, and consequently the reliability of the assessment thus produced, the work team should be mixed, with representation of more than one research institution and/or consulting company and with inclusion of experts from the assessed public administrations.

For each dimension composite indicators can be constructed aggregating lower level indicators, and in turn the three indicators thus constructed can be further rendered, through opportunistically selected weights, into a one single simple composite index. We stressed the adjective 'simple' to clearly render the important fact that such index would not be based on causal equation, partial least squares, or other more sophisticated and therefore not of the same robustness of the likes of the American Customer Satisfaction Index.

4. Implementation Methodology Underpinning

4.1. Building blocks of the Implementation Methodology

...

4.2. Composite Indicators

...

4.3. Revenue/Risk matrix: implication for project portfolio management

As underlined earlier, being the framework a sort of scorecard to measure the impact of eGovernment, either internal and external to the public sector, a criterion based on the assessment of the contribution of a specific activity or project to the framework itself appears extremely fruitful to policy makers.

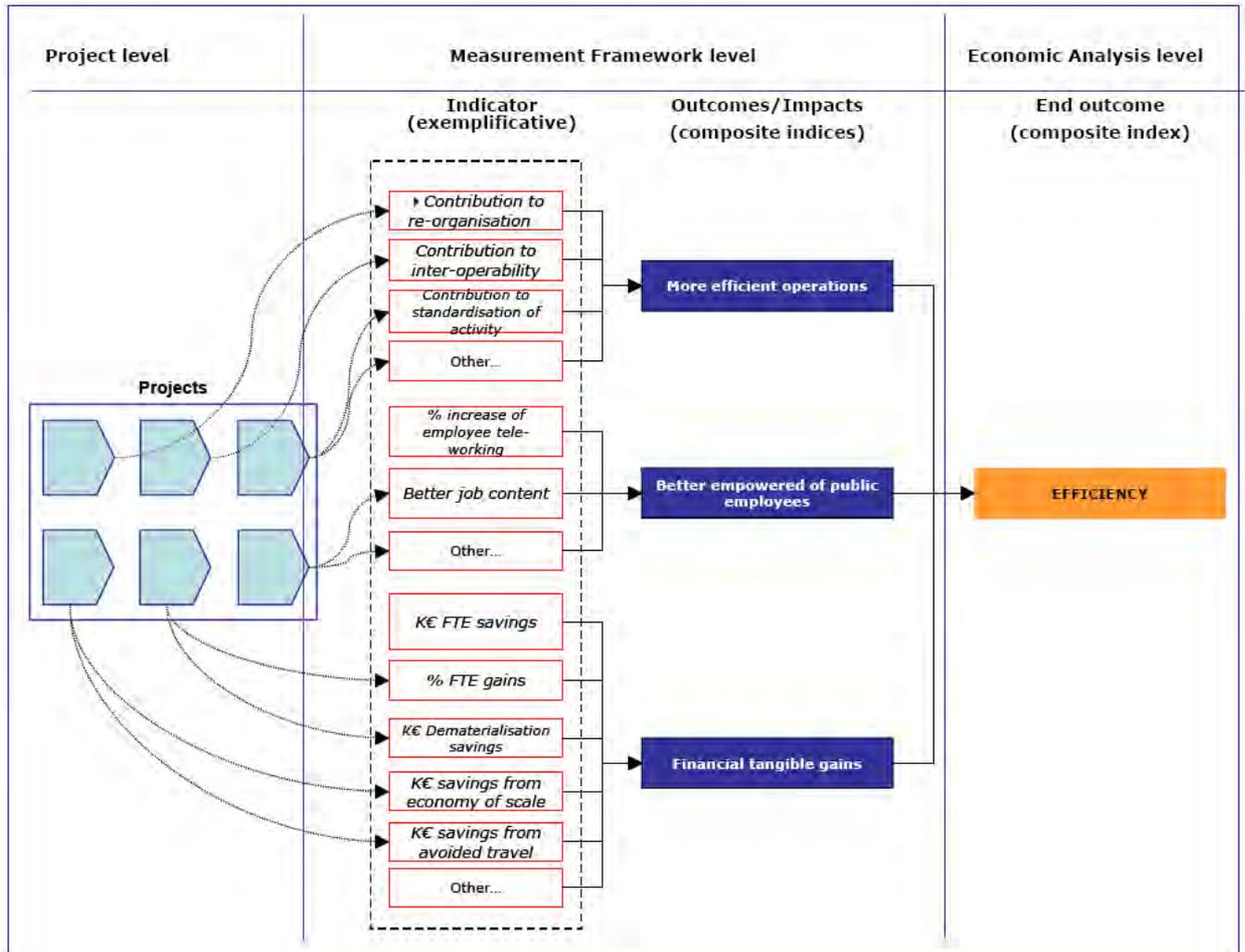
In that perspective, we have suggested that it is useful to compute the global composite index for each eGovernment project, including only those variables that are considered relevant for the project itself. This can lead to a measurement of the single project contribution to the framework, in terms of efficiency, effectiveness and governance, which could be quantified as the absolute degree of improvement of the public sector performance. The relation between project, framework and overall performance is presented in the following exhibit, that depicts in an explanatory manner the link for the analysis of the efficiency value driver.

(see exhibit 11 below)

Once this evaluation has been accomplished for the entire project portfolio, decision maker can make comparisons between projects in terms of contribution to the framework. However, selecting projects is a very complex activity, that must take into account both revenues and risks associated to each project. As a matter of fact, given limited resources, the simultaneous evaluation of revenues and risks allows decision makers to select projects in terms of expected value. This selection can be done by the mean of a revenue/risk matrix in which each project is identified along three dimensions:

- **Revenues:** it is equal to the value released by the project, in terms of economic-financial value generated; in our approach revenues can be estimated by the absolute degree of improvement of the public sector performance associated to the project. The measure is provided by the percentage amount of the global composite indicator;
- **Risk:** associated with each project, it is measurable through the assessment the volatility or variability of relevant variables for the project: costs, revenues (degree of improvement of the public sector performance), lead time of the project, etc. The measure is provided by the complement to one of the ratio between global composite indicator accounting for risk and global composite indicator not accounting for it.
- **Resources:** amount of resources invested, in terms of man-hours (FTEs) or in terms of economic-financial value of the investments for the project. In our framework this amount is equal to the total costs of the project.

Exhibit 11 Project, Framework and Economic Model Link (Exemplificative)

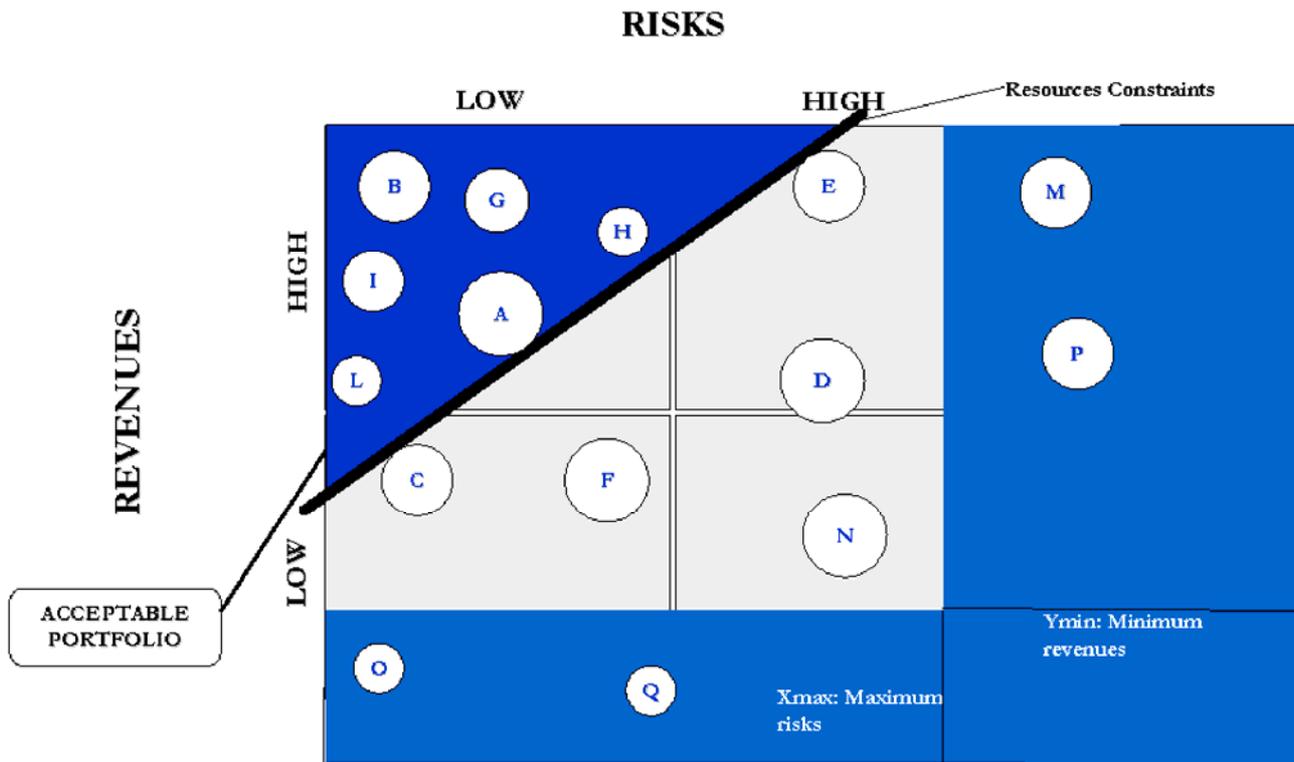


All three dimensions are then joined in a single matrix (see the following exhibit), whose two dimensions are represented by risks and revenues, while the third dimension (resources) is represented by the size of the circle that identify each project.

(see exhibit 12 below)

At a first glance to the Exhibit, it is possible to identify a first set of constraints, referring to a minimum value of revenues acceptable and a maximum level of risk sustainable. Consideration about constraints allow for reducing the alternatives of choice available and, thus, rejecting some projects that appear external to the area of the matrix actually appealing for the firm. Another constraint to be considered is resource-availability. It is represented as a line that divides the matrix in two portions, the one on the high left corner that includes the acceptable projects that could be selected in the portfolio, the other in the right side of the line, referring to the unacceptable projects. The resource-availability constraint line is conceived as a linear utility curve, whose inclination measures the risk-aversion of the decision maker. In the matrix the above-mentioned line is drawn from the high left corner that identifies a high relevant area of low risk so that it displays the most appealing projects, continuing toward the opposite corner that identifies an area less attractive given the high risk/low earning profile. Moving from the high left corner to the low right one, the line meets with projects characterized by a decreasing utility scale, until it stops in correspondence of the resources saturation. By this way, the line identifies the desirable portfolio.

Exhibit 12 Risk-Revenue Matrix



[Annex A not included in abridged version 06/2008 WiBe-TEAM PR]