A framework for benchmarking public websites in the labour sector

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Abstract: A framework related to how to benchmark public websites in the labour sector is proposed using approaches coming from eGovernment. A methodological approach to benchmark these sites is presented consisting of a set of indicators to be applied step-by-step to labour websites to evaluate their usage and effectiveness. The paper shows how this approach, although general enough, does not work for some cases. These cases are illustrated for two information systems offering Public Employment Services, namely the information system of Lombardy – Italy (Borsa Lavoro Lombardia) and the information system of Catalonia – Spain (Servei d'Ocupació de Catalunya). The paper tries to find out the motivations of success and of failure of these two cases, which relate to very similar social, economic, and territorial situations and yet evolved into very different systems with diverse stories and a different final result in usage and success. In fact, while Borsa Lavoro Lombardia is currently non-operative, SOC (<https://gia.oficinadetreball.cat/>) is fully operative and widely used with a network of employment services offered by private agencies as well.

Keywords: employment services; prevention of unemployment; benchmarking indicators; eGovernment performance measurement; eGovernment portals.

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1 Introduction

Making public websites more valuable in their content, as well as more user-friendly and accessible are key requirements in order to ensure their success and enable eGovernment deployment. In the sense of eGovernment, in Catalonia, the SOC (Servei d'Ocupació de Catalunya)¹ institution has strengthened its multidimensional organisation through the past decade in order to provide better services, increasing efficiency and effectiveness in the public sector of employment services and enabling faster connections with less people employed in governmental offices located at various sites. In Lombardy, the BLL system (Borsa Lavoro Lombardia) for employment services has been at work from 2003 to 2011 ascribed to Regione Lombardia and later included in the National System Borsa Nazionale del Lavoro, as described in Fugini et al. (2013).

In both systems, huge amounts of resources have been invested to develop and implement new and better information systems in a complex and sensitive area such as support of the provision of employment services. However, the efficiency of these systems is measured too little, and often without using any formal methods and comparisons between similar realities. Without a methodological ex-post evaluation, huge amounts of money could be invested without achieving the desired results. Overall improvement could instead be achieved more safely, more quickly, and, not least, with more limited investment, by simply focusing on key factors identified during the analysis carried out ex-ante and ex-post.

Assessment methodologies for eGovernment systems and for web-based systems generally try to respond to the following basic questions: what is really relevant for assessment? What methods can be employed for the assessment? Despite efforts made in this field, there is still room for exploration (Snead and Wright, 2014). While a considerable number of contributions to the design of an assessment framework, the approaches used are quite different, some deserving special attention in that they share certain dimensions, factors and metrics.

Our objective is to confirm that services provision for the labour market using information and communication technology (ICT) may be assessed using a model and a logical approach similar to that of eGovernment systems. In this paper we overview assessment methods, present a framework for measuring the value of eGovernment and a methodological approach based on the observed mainstream lines. We also discuss why the proposed assessment framework could work by comparing it with the indicators applied to operate and manage the Catalan Employment Service (SOC) and the Lombardy Employment Service (BLL) and identify potential inadequacies. We conclude the paper by presenting our results. Our ultimate purpose is to understand what is missing from the framework and/or from systems for assessing ICT-based services in the labour market.

2 An overview of assessment frameworks

Suggestions from the United Nations, from national agencies and from other bodies regarding the evaluation or benchmarking of eGovernment projects exist. Different dimensions, such as political and strategic, economic, technical and operational and social are included within the evaluation (Irani et al., 2008; Liu et al., 2008). Multidimensional frameworks are considered, involving maturity levels, stakeholders and assessment dimensions (Esteves and Joseph, 2008). Siskos et al. (2014) proposed a multi-criteria methodology using a system of eight evaluation criteria that are built on four points of view: infrastructures, investments, e-processes and users' attitude. Diverse assessment dimensions are considered in models to evaluate information system success for ecommerce (information quality, system quality, service quality, usage, user satisfaction and net benefit) (DeLone and McLean 2003), some of them later empirically verified for eGovernment systems (Wang and Liao, 2008; Teo et al., 2009). Other proposals support the assessment of specific impacts such as reduction of the administrative burden of business-to-government systems (Arendsen et al., 2014) or users' satisfaction levels in the provision of eGovernment services using a framework of four main constructs: cost, benefit, risk and opportunity (Osman et al., 2014).

Table 1 Historical evolution of eGovernment assessment dimensions

Dimensions	Authors/frameworks										
	2000–2005			2006–2010				2011–today			
	G&J (2003)	D&M (2003)	Kearns (2004)	eGEP (2006)	Heeks (2007)	E&J (2008)	Liu et al. (2008)	Irani et al. (2008)	Rowley (2011)	Luna et al. (2012)	Rose et al. (2015)
1 Strategic	*		*	*		*	*	*		*	*
2 Economic and financial	*	*	*	*		*	*	*	*		*
3 Organisational and technological	*	*		*	*	*	*	*	*	*	*
4 Services provision	*	*	*	*	*	*	*		*	*	*
5 Social outcomes			*	*			*	*	*	*	*
6 Political and democratic			*	*					*	*	*

From an analysis of the literature on the assessment of eGovernment systems, the main dimensions used by each author in the proposed models-frameworks can be summarised as in Table 1 (Fugini et al., 2014).

The organisational, economic and financial and operational dimensions are used in most of the models or frameworks. The economic and financial dimension is relevant since these projects need a high capital investment, nevertheless some practitioners are quoting that political targets could overcome it; but also considered are other dimensions related to citizen needs and new eGovernment applications implemented to improve transparency, trust, participation, democracy and governance. The service dimension, expected to be the main objective for public administrations would be quoted in a second level of relevance because of some high quality services are not always considered, while other dimensions, such as quality decision-making and improvements to planning and quality control are quoted in fewer studies. Despite this, these dimensions are believed to be important, mainly the dimensions of service and public trust in the institution.

Observed during the analysis were some differences related to the definition of the dimensions. For instance, the dimension of service, as presented by Rowley (2011), Wang and Liao (2008), eGEP (2006), Kearns (2004) and Gupta and Jana (2003), includes the assessment of information provided and user satisfaction as powerful points. As regards the dimension of trust in public administration, Kearns (2004) and Teo et al. (2009) consider this to be an autonomous dimension, while Liu et al. (2008) break it into two sub-dimensions enclosed within the larger social dimension.

The sub-dimension of decision-making quality (and planning and control quality) could easily be incorporated within the strategic dimension. In fact, decision-making quality is not completely absorbed by the strategic dimension but could be broken in two. One part deals with the quality of decision-making at the strategic level, as mentioned above, while the other will feature as part of the dimension of service provision and the assessment and monitoring of the quality of the decisions made when a service is provided.

The analysis of the literature reveals a large number of different approaches, all developed with the purpose of designing a model to evaluate eGovernment systems. It seems that most are adapted to assess according to different objectives and situations related to the conditions and needs of a particular region or country, which would make sense to use them in different scenarios.

3 Measurement of the value of eGovernment and system benchmarking

Governments operate with a budget for the provision of services for society, managing the assigned resources in an efficient and effective way in order to reach the established objectives. Value can be generated through the use of information technology in innovative processes – such as eGovernment understood as an innovation, since it includes the redefinition and improvement of procedures and transactions through the use of ICTs. The ex-ante evaluation can be carried out using techniques of assessment and risk analysis, where the costs of development are related to future benefits estimation; the ex-post evaluation can use techniques of economic analysis. The economic assessment is based on the generation of revenues, cost reduction, return on asset (ROA) or return on

investment (ROI). Nevertheless, value consists of much more than the economic variables.

In an attempt to better support the assessment and benchmarking of complex eGovernment systems, we consider a framework and several key steps for a methodology that are generalisable without neglecting most of the entities that are part of these complex scenarios and allowing a very high level of precision in the analysis. The evaluation framework for eGovernment systems considers those elements proposed by Esteves and Joseph (2008), namely,

- 1 analysis of the eGovernment level at which the system is located (both maturity and geographical extension)
- 2 identification of the main stakeholders
- 3 analysis of the assessment dimensions, including two new dimensions assessing social as well as political and democratic values, together with a set of factors and indicators to support the analysis.

Subsequently, emphasising the methodological point of view, a set of macro-environmental factors to support system benchmarking is also proposed (4).

3.1 *Levels of eGovernment*

Quite a few years are needed to develop an eGovernment project that includes several functions and services, through different levels of eGovernment maturity. Therefore, the first step of an evaluation process is to analyse the *maturity model* and the related eGovernment levels. This leads to a deeper understanding of the context in which the specific project is located, so making subsequent evaluation phases more effective, namely, the identification of stakeholders and analysis of dimensions.

Public bodies begin to develop eGovernment by creating a simple website to have a presence on the web, with subsequent steps leading to more sophisticated functions. These steps in the development of online services are as follows (UNPAN, 2003; UNDESA, 2010):

- *Emerging*: supporting information services regarding policy, documentation and public services and linked to other public web portals (ministries, regional and local authorities, etc.).
- *Enhanced*: with services based on simple interaction, mainly government to citizen (G2C) (downloading and filling out online forms, audio and video technologies, etc.).
- *Interactive*: with services based on two-way communication, whereby users can request information about politics, laws, programs in place, etc., and can download and upload forms.
- *Transactional*: including services such as to pay taxes, apply for identity cards, birth certificates or passports. This highest level of networked eGovernment covers government interactions with government, with business and with citizens (and the reverse). The government is willing and able to involve society in a two-way dialogue and solicits the views of people acting as citizens and as consumers of public services.

eGovernment definitions range from generic to more specific and the implementation of eGovernment can take various forms, ranging from a single website with contact information (address, telephone and fax numbers, e-mail address, etc.) to an interactive, consolidated gateway and integrated services at all levels of government, from local to national or federal (Rorissa et al., 2011). The United Nations Survey 2012 assessment of progress indicates that eGovernment is increasingly being viewed among countries in the vanguard as going beyond service delivery towards a framework for a smart, inclusive and sustainable growth for future generations (UNDESA, 2012). Possible geographical levels of eGovernment are local, provincial, regional, national or international (Heeks, 2007). Most of the existing studies on benchmarking have focused on national eGovernment, leading to some assessment limitations at the regional level.

3.2 Stakeholders

Because eGovernment includes a wide range of services, products, people and procedures, a key issue in evaluating eGovernment systems is to clearly identify scope, boundaries and aims. Aims can be focused on [Esteves and Joseph (2008) quoting Heeks (2001)]:

- *E-administration*: when process improvement is through cost reduction, performance management and control and the creation of strategic connections with other public bodies or society
- *E-services*: when communication with government is pursued in support of public accountability, democracy and improved public services
- *E-society*: related to the development of communities, to the creation of partnerships between governments and agencies, and to the creation of new means for strengthening the development of society.

Nevertheless, the reality is more complex and the boundaries of eGovernment systems can overlap. As an example, an e-services system can enclose some e-administration components and vice versa. Stakeholder identification becomes complex because of the option of performing according to different roles.

The proposal to use the stakeholder concept to support management actions seems also to help in standardising stakeholder characteristics and has been used at different times by different practitioners. According to Rowley (2011), the concept of stakeholder in the context of analysing the long-term success and effectiveness of an organisation was proposed in a seminal work by Freeman (1984). Freeman's definition is that "a stakeholder in an organization is (by its definition) any group or individual who can affect or is affected by the achievement of the organisation's objective".

Stakeholder theory was developed for private corporations and the option to use this concept in public administration has been considered by different authors, some for and others against the idea. Thus, stakeholder theory as transferred from the private to the public arenas seems to be accepted by different researches (Tan et al., 2005; Rowley, 2011). Mitchell et al. (1997) contribute to a stakeholder theory of identification and salience based on the attributes of power, legitimacy and urgency. From a managerial point of view, salience is related to the degree to which managers give priority to stakeholders' claims. In the public administration sphere, the stakeholders' characteristics

seem to play a key role, even though related concepts such as equality, transparency, etc., also prevail.

A proposed typology of eGovernment stakeholder roles [based on Rowley (2011)] is as follows:

- a people as service users
- b people as citizens exercising civil rights and participating in democratic processes
- c businesses fulfilling their tax, social and legal obligations
- d public administrators (employees)
- e other government agencies at local, regional, national levels
- f non-profit organisations and other associations
- g politicians
- h eGovernment project managers and ICT professionals
- i suppliers
- j partners
- k other.

Here, the stakeholder is an entity representative of an individual, group or firm, which acts actively or passively with respect to the decisions made and actions taken by the public body. The main stakeholders in an eGovernment system can be classified in different ways. Based on diverse stakeholder roles, categories or entities, different types of relationships between society, governments and public bodies have been identified that take their name from the nomenclature: G2C, government to business (G2B) and government to government (G2G) (UNPAN, 2003). Other authors include new sub-categories, for instance, government-to-civil society organisations (G2SC) and citizen-to-citizen (C2C) (Yildiz, 2007; Rowley, 2011).

A great variety of stakeholders exist in the labour market, each with diverse roles. Complexity arises especially when models are designed while trying to formalise this point. Different stakeholders with different roles can perceive different value dimensions depending on the role adopted. This point reflects the huge diversity of eGovernment systems, planned, designed, implemented and used in a range of public agencies, geographical levels and value dimensions. The need to formalise them seems to be clear. To sum up, the identification of key stakeholders is necessary in order to identify the scope of the evaluation of an eGovernment project. Each stakeholder and their role may be viewed as a component of the analysis; and analysis of the stakeholders in a system as a whole helps analyse and assess the global eGovernment system.

3.3 *Value dimensions*

Six interrelated dimensions (considering stakeholders, maturity level and the main factors related to value generation) can be used to evaluate eGovernment systems, depending on the nature of the eGovernment project. These six possible dimensions to be considered are strategic, economic and financial, technological and organisational, service provision, social and political and democratic.

The *strategic dimension* focuses on future plans for the development of eGovernment systems. To assess this dimension it is necessary to make a comparative analysis between the established objectives for actions planned at a strategic level and the results obtained once the eGovernment project is up and running. An example of an eGovernment strategic objective could be to increase the number of accesses to the portal to obtain information or increase the number of jobseekers and companies using a national or regional portal.

This dimension consists of three sub-dimensions: strategy definition and control, risk management and decision-making quality. While risk assessment should be carried out ex-ante it would be desirable for analysis to be implemented ex-post because of the important implications for organisational learning.

The *economic and financial dimension* measures the economic value of an organisation's resources, costs and the value of goods and services produced. Financial accounting measures, however, cash outlays or cash receipts. There are differences between economic and financial accounting, so we consider the following sub-dimensions as appropriate to fully represent this important dimension: ROI and cost-benefit improvement, system cost effectiveness and efficiency gains.

The *organisational and technological dimension* includes the sub-dimensions of structure, human capital, integration, accessibility, and evaluation of hardware, software and ICT infrastructure for the eGovernment. Culture could influence learning through knowledge sharing and cohesion within an organisation. The evaluation analysis enables determination of whether the technological resources used are sufficient to support the initiative and meet the needs of the stakeholders. Effective integration between front-end and back-end seems to be a key factor in determining the final value of the eGovernment system. The technology used cannot be considered in isolation but must be fully integrated with all functional areas and departments. Other factors to be analysed are accessibility and the digital divide in relation to citizens, communities and businesses. If a group of people do not have access to new communication technologies the usefulness and hence the value of the specific system of eGovernment will be reduced. Because eGovernment is closely related to democratic values, it should allow equal access to all citizens regardless of socioeconomic status or abilities. Three fundamental aspects must be considered in order to obtain a comprehensive technological evaluation of eGovernment systems: size, integration and accessibility. The technological dimension is very important for a public administration because its main task is to satisfy the needs of citizens through the provision of an equitable service.

The *dimension of service provision* assesses the quality of the services offered by eGovernment. Benefits of eGovernment programs cannot be calculated only in financial and economic terms because the implementation of eGovernment projects can lead to improvements in access to services or the quality of the information provided (reduction in waiting times, etc.). The sub-dimensions are service quality, satisfaction and fulfilment and the usefulness of information provided. The *social dimension* is a key factor in model evaluation for public administration. Sub-dimensions are fairness of service provision (including security, justice, etc.), trust and confidence in government (including transparency, accountability, security, privacy, etc.) and satisfaction regarding human development (including learning, skills, health, etc.). The *political and democratic dimension*, although including social aspects, is also related to openness, transparency and accountability and participation. Openness is related to policy drafts available and processes open online; transparency and accountability to processes fully traceable online

and agencies reporting their expenditure online; and participation is related to contributions to online forums and queries submitted online.

The analysed dimensions are presented in Table 2.

Table 2 Assessment indicators

<i>Dimensions</i>	<i>Sub-dimensions</i>	<i>Indicators</i>
Strategic	Strategy definition and control	Definition of objectives and success level control
	Risk management	Reduced risk factors
	Decision-making quality	Number of decisions and alternatives (Gupta and Jana, 2003)
		Time required for decision (Gupta and Jana, 2003)
Economic and financial	Benefit/Cost ratio. ROI	Identification and measurement of components (Kearns, 2004)
		Return on investment for a project or system ratio
	Cost system effectiveness	Reductions of the overall and unit costs (Kearns, 2004; Rowley, 2011)
	Efficiency	Economies of scale gains (eGEP, 2006; Luna et al., 2012)
Organisational and technological	Structure	Time to process a standard case (eGEP, 2006)
		Re-designed business process (Rowley, 2011)
		Number of formalised processes (Rowley, 2011)
		Hierarchical levels and staff participation (Rowley, 2011)
	Strengthening human capital	Increased efficiency, resource rationalisation, greater productivity, etc. (Rowley, 2011)
		Time savings (Rowley, 2011)
		Competent and skilled staff achieving greater output (Rowley, 2011)
	Integration	Online exchanged documents
		ICT infrastructure coherence score (eGEP, 2006)
	Accessibility	ICT enabled face-to-face contact points (eGEP, 2006)
		Usage by disadvantaged groups (eGEP, 2006)
	The system and ICT infrastructure	SMEs bidding for public tenders online (eGEP, 2006)
		Nature of back office changes (Heeks, 2007; Rowley, 2011)
		Services available online (Heeks, 2007)
		Privacy rating for websites (Heeks, 2007)
		Usability score (eGEP, 2006)
		Public agencies with integrated ICT financial and resource planning (eGEP, 2006)

Table 2 Assessment indicators (continued)

<i>Dimensions</i>	<i>Sub-dimensions</i>	<i>Indicators</i>
Service provision	Service quality	New access channels and choice (Kearns, 2004)
		Stakeholders involvement (Irani et al., 2008)
	Information usefulness	Transparency, accountability, etc... for users (Rowley, 2011; Luna et al., 2012)
		Users getting information (Kearns, 2004; Heeks, 2007)
Social	Satisfaction – fulfilment	Validity, accuracy, sufficiency, timeliness, reliability, relevancy (Gupta and Jana, 2003)
		Time saved for citizens and businesses (eGEP, 2006; Heeks, 2007)
	Fairness	Service fulfilment (problem solved) (Rowley, 2011)
		User-satisfaction (citizens, companies, staff) index (eGEP, 2006; Rowley, 2011)
Political and democratic	Trust and confidence in government	Justice and security ratings (Rowley, 2011)
		Fairness of service provision (Kearns, 2004)
	Development	Transparency, accountability, security, privacy, etc. (Rowley, 2011; Luna et al., 2012)
		Developing learning and skills (Kearns, 2004; Rowley, 2011)
	Openness	Employment and jobs (Rowley, 2011)
		Response time to online queries (eGEP, 2006)
	Transparency and accountability	Policy drafts available online (eGEP, 2006; Luna et al., 2012)
		Processes open online (tendering, procurement, etc.) (eGEP, 2006; Luna et al., 2012)
	Participation	Processes fully traceable online (eGEP, 2006)
		Public agencies reporting their budget and expenditure online (eGEP, 2006; Luna et al., 2012)
		Services involving a two-way interaction with users (eGEP, 2006)
		Accessibility rating of sites and participation (Kearns, 2004; eGEP, 2006; Luna et al., 2012)
		Contributions to online discussion forums (eGEP, 2006)
		Queries submitted online (eGEP, 2006; Luna et al., 2012)

The proposed performance measurement attempts to give a quantitative representation of the success of a public administration in achieving a specific purpose related to eGovernment systems. Several indicators or measures have been proposed by different authors to provide some suggestions regarding the options available to organisations. Nevertheless an appropriate set has to be chosen for each case, so the above classification could provide a useful guidance. Even though the list of indicators is not exhaustive, they can be generalised and customised to fit different social and cultural contexts. It is

suggested to use a small number of indicators in order to facilitate the interpretation of meaning, exercising caution regarding the risks of measuring and problems of data reliability, accuracy and completeness of data resulting from the way the data was collected.

3.4 The macro-environmental analysis: factors to support system benchmarking

The features of the macro-environment influencing the organisation of service provision and the related information systems are considered together with those factors related to the main needs and constraints when eGovernment systems are designed, built and implemented in each region. These factors are related to the political and legal, economic, sociocultural, technological and demographic spheres. In such contexts, the comparison of the different employment service provision systems will be possible if the values related to their own situation are taken into account, on the basis of which precise considerations concerning their real impact on the region can be deduced. Some geographic data describing regions, – including *macroeconomic data* such as population, unemployment, gross domestic product (GDP), economic sectors composition; *political-legal data* such as employment laws, social welfare policies; *sociocultural data* such as levels of education, social mobility and technological data such as technological research and development effort, infrastructures –, appear to be some of the key indicators in order to support the benchmarking of eGovernment systems and some also for the labour market.

4 The validity of the proposed framework for the labour market: the methodology

In order to validate the proposed framework and methodological approach for the assessment and benchmarking labour market public service provision systems we analysed whether the BLL and the SOC have used, use or do not use the indicators and dimensions included in the proposed framework. From this analysis some results and conclusions have been drawn. The first system is located in Lombardy (Italy) while the second is located in Catalonia (Spain). Both largely exploit information and communication technologies (ICT) to achieve their goals, but the service provisioning models are quite different. The Lombard system (named BLL) connects public and private operators providing services to job seekers and employers. In such a system, a curriculum vitae (CV) or a job offer posted to a public employment office or to an agency is shared among all the operators being part of the federation. BLL leverages web technologies through which final users can post job offers and demands with no need for physical a presence in front of operators or mediators (agencies). Analogously, employers can post a job offer on the web. On the other site, the Catalan system is based on a network of public offices not fully collaborating yet with private agencies working in the recruitment area. ICT (web-based mainly) are used to provide diverse services online such as information on job offers, CV, training courses, guides, legal roles..., administrative procedures for companies and job seekers, etc. The system is also useful to communicate to the central Spanish Government the lists of unemployed to trigger unemployment contributions and other statistical data, as well as to share information on job offers and CVs.

We argue that the selected and presented cases allow to apply the proposed framework, based on eGovernment, to identify and validate other cases using the same indicators used in the evaluation of other eGovernment systems for employment. To do that, two steps can be followed. The first is the identification of the indicators used by various stakeholders to check if those are present in our framework. This is the main target of the research, and this phase is prevailing qualitative. Then, in a second phase of quantitative type, very relevant to obtain an evaluation and a benchmarking, we proceed by evaluating the indicators. In the analysis performed to identify the indicators, we have particularly considered the access to data to permit their subsequent evaluation.

For the implementation of the experiments and for the subsequent analysis, we selected the time interval 2006–2011/2012, when the two Systems were operational. Also, the historical perspective brings about a wider vision, better than an immediate evaluation. We apply the proposed framework on two different solutions, with different functions applying over two social, economical and political situations which are very similar. The similarities hold for a sufficiently long time to be analysed. In these conditions, the experiment consists in asking “Can two different systems, developed in diverse periods, give solutions to similar need with the same or similar level of results?”. “Is the proposed framework valid to evaluate both Systems?” And also “Was BLL possibly too advanced with respect to its development time?” Possibly, these factors affect the value of some indicators. However, we think that neither the act of identifying indicators nor the precision degree necessary to estimate them truly affect the method of validation proposed here.

5 Electronic public services for the labour market as a paradigmatic case of eGovernment

eGovernment includes diverse activities, like eAdministration, eVoting, eParticipation, eServices for health, labour, social services, and public administrations in general. The application of ICTs in this field is extensive, as is the public administration with its multiple and diverse departments, agencies, levels of organisation. In such streamline, the spreading of the term eGovernment shares from one side the approach of service provisioning and knowledge management towards citizens, companies, institutions and the exploitation of ICT tools, in particular of (web) services and distributed technologies, to support very different activities concerned with government and administrative tasks and to participate in debates regarding PA.

In several of the existing systems for the provision of public services based on ICTs in the labour market, a basic scheme similar to that of eGovernment may be found. Thus, in the political sphere there is a need for developing policies for the labour market at the regional, national and international levels, such as training, advisory and guiding policies to adapt supply to demand by

- 1 age segment
- 2 long-term unemployment
- 3 young people, etc.

In the administrative sphere there are services such as:

- 1 managing unemployment benefits
- 2 registration and termination of contracts
- 3 liaison between public administration departments to request certificates directly, rather than citizens having to do so
- 4 employment services dealing with job offers and requests
- 5 supporting regional, national and international mobility, etc.

All of the services mentioned above and related activities may potentially benefit from the application and use of ICTs.

The employment market includes key ingredients related to resources, processes and relationships among government, public administration and citizens, for a full view of eGovernment and therefore we are trying to use eGovernment assessment methods to guide the design and application of an assessment and benchmarking framework for the provision of ICT-based public services for the labour market. By exploring the field of services for employment, we analyse the services offered through ICTs and the assessment methods used in the application of these systems in order to validate our framework. The question raised is whether some assessment and benchmarking proposals taken from the domains of eGovernment, eCommerce or similar could be used to evaluate ICT-based service provision systems for the labour market and why this is or is not the case.

5.1 The maturity of the systems and the stakeholders

It has been observed that new services and functions have been included during a long period in the BLL and the SOC following the eGovernment maturity model. The BLL was fully active with new functions from 2003 to the end of 2011, when the service was transferred to the Italian Work and Welfare Ministry. Currently, it supports only some basic services out of the large set of services addressing education and professional information as previously. The SOC website was launched in 2006 and several new functions have been implemented since then. Currently, SOC is still simple in its offered services but effective maybe due to its easy-of-use and to the conciseness of its structure.

The proposed typology of eGovernment stakeholder roles seems to be appropriate to modelling the existing relationships among users of both the BLL and the SOC. While the BLL is based on a cooperative approach in order to integrate private job agencies, that allow them to share some data and compete in placements (a mix of competitive and cooperative behaviours), the SOC operating model only recently included private actors, allowing them to participate in a cooperative way since then. The main stakeholders analysed are: companies, citizens, unemployed people, redundancy payment recipients, PA staff (employment services, social security ... – at different geographical levels), governments (Regional, National, European), training companies and institutions and private employment agencies and portals.

5.2 The assessment dimensions

The six dimensions proposed for assessment of BLL and SOC were analysed providing the results given in what follows. Some are presented in Table 3.

Table 3 The main indicators used in the assessment of public service provision systems related to employment

<i>Dimensions</i>	<i>BLL indicators</i>	<i>SOC indicators</i>
1 Strategic	Success in achieving objectives, etc.	Success in achieving objectives, etc.
2 Economic and financial	Budget fulfilment, etc.	Reductions in the overall and units costs, budget fulfilment, etc.
3 Organisational and technological	Resource rationalisation, redesigned processes, usage by disadvantaged groups, services available online, etc.	Resource rationalisation, redesigned processes, strengthening of human capital, usage by disadvantaged groups, services available online, etc.
4 Service provision	Number of visits, service quality, etc.	Number of visits, number and type of procedures, service quality, number of jobs offered and managed, etc.
5 Social	Fairness of service provision, number of people trained and given guidance, etc.	Fairness of service provision, development of learning and skills, number of people trained and given guidance, etc.
6 Political and democratic	Expenditure, actions and services reported online, etc.	Expenditure, actions and services reported online, legal information available online, etc.

5.2.1 The strategic dimension

In both organisations, indicators related to aims, organisational structures, stakeholders and public perspectives are used, although neither integrated formal frameworks nor processes are used. The mission of the SOC and its objectives are based on the General Plan for Employment of Catalonia, the main guide for political action in employment, which includes Spanish government and European Commission guidelines. The BLL is also integrated within the Italian system and includes guidelines issued by the European Commission.

5.2.2 The economic and financial dimension

Both organisations do not generally rely on eGovernment evaluation methods based on economic and financial considerations, such as cost-benefit analyses. Such methods seem to be perceived as not very appropriate, given that decision-making is governed less by financial criteria and more by political and service quality considerations. Nevertheless, cost indicators as used by the SOC are considered to be important for managing services. The ICT and reengineered processes in the SOC are considered to yield benefits in the form of cost reductions and freed-up human resources that can be deployed to improve customised face-to-face services. For instance, this was evidenced when the DARDE system (developed to improve processes efficiency) was implemented – via the internet and self-service points – to control the status of a large number of unemployed people and their benefits, as it was possible to move SOC staff from this process to professional guidance services. The payback period for the investment in the self-service points was considered to be less than a year.

The ICT and engineering of processes conducted in Regione Lombardia turned out to give benefits in terms of cost reductions, however not in freed-up human resources, as occurred in SOC. In fact, a great amount of human capital was deployed to develop and then maintain BLL, with the drawback of a large engagement of manpower completely devoted to BLL and later removed from the effort of implementation and maintenance too early and with low commitment to continue with the initial efforts.

5.2.3 The organisational and technological dimension

Factors related to the organisational and technological dimension were also considered when self-service points were introduced at SOC, in order to evaluate the impact of ICT on the reallocation of staff to guidance activities. Technological aspects were also considered to support the design of self-service points in order to decrease the technological gap affecting approximately 40% of users. While BLL seemed to underestimate organisational and technological factors, when connections to provinces and private agencies were introduced. Careful studies should have been conducted in order to evaluate the impact of BLL on the reallocation of local staff to various activities.

5.2.4 The service provision dimension

The number of visits and type of procedures carried out through the SOC website (also from the self-service points and offices) is monitored. Information from external users of certain services is collected for central processing. Service quality is also monitored through a monthly analysis of user complaints and suggestions and a user satisfaction survey issued via the chat query service. Nevertheless, this evaluation does not take into account satisfaction with the ICT and considers only the service provided. The number of offers handled by the SOC through FeinaActiva (the SOC portal to manage job offers and requests) has increased by 30%, but no information is available on the success rate in terms of placements resulting from job offers managed by the SOC.

Similarly to the SOC, the number of visits was considered and service quality was scarcely monitored at BLL, under the stress of being present on the 'market' soon, no matter what the user interface usability and the impact of such a big innovation in eGovernment was. Instead, the established agenda was implemented and the system launched without a clear follow up strategy. Information about quality from external users of services remained uncollected and unmonitored. Some suggestions and a user satisfaction survey were issued too unfrequently via the suitable survey channels.

5.2.5 The social dimension

Within the social dimension, indicators related to the fairness of the service were especially considered at SOC when the self-service channel was planned, with the aim being to overcome the low level of internet use among certain groups of unemployed people. Analysis of the results shows that between 40% and 50% of users are discriminated against by the internet. Development of professional skills and training for specific groups is evaluated occasionally through statistical analyses of group samples.

Indicators related to the fairness of the service were underestimated at BLL, also considering that in 2003, the services used via the internet were still unusual, and that self-service channels remained at a low level of diffusion especially among some groups

of unemployed people. We can affirm that an analysis would easily show that up to 50% of users have been discriminated against by internet.

5.2.6 *The political and democratic dimension*

Even though a number of projects have been developed recently in this area – such as those related to networking and social control in order to identify the main users' needs and to obtain feedback on the services – no evaluation process has been carried out as yet. Information on the forecast budget and real expenditures classified by expenditure groups is the classical indicator for transparency and accountability.

5.3 *The environmental analysis for the Catalan and Lombard systems*

Coming to the features of Lombardy and Catalonia, we observe that the two regions have various similarities from the demographic, economic, technological and cultural point of view. In such similar contexts, the comparison of the two different service provisioning systems stimulates some interesting considerations about the impact of the employment services on the local employment market and in general about the context.

The Lombardy and Catalonia Regions are very similar from the economic and the cultural point of view. Both regions are members of the 'Four Motors of Europe' association whose members are four highly industrialised regions in Europe significantly contributing to the European GDP. Lombardy and Catalonia are the main contributors to their country's GDPs. From the historical and geographical point of view, both Lombardy and Catalonia are located in the Latin Europe (the Romance-speaking nations of Europe, since their language stem from Latin), they have similar religious distribution and strong cultural similarities.

5.4 *The impact of public websites on the labour market and stakeholders*

In this final section, we summarise and make some remarks on the main impact that the use of public websites has on the labour market. This has been studied for the cases of the employment website BLL and the Catalan employment service Servei d'Ocupació de Catalunya (SOC), within the framework of the established methodology. The most important contributions in each of the *six dimensions* studied are described for the principal stakeholders involved. The findings are summarised in Table 4 and are illustrated hereafter.

- 1 In the *strategic* area, for the *government*, the eGovernment system helps to improve the employability of the population (particularly young people, the long-term unemployed, those aged over 55 and sectors in crisis), it boosts the efficiency of services, facilitates the design of less risky policies and plans and increases the number of users (mainly the unemployed and companies), as well as the number of visits to the website (from 0.7 million in 2008 to 2.8 million in 2012 for the SOC). The *public administration* has more and better quality information for making decisions about managing the service and contributing to government objectives. *Companies* also perceive that they make better hiring choices thanks to the availability of more information and CVs. A reduced risk of failing to achieve

objectives is perceived by all stakeholders. In addition, *private agencies* are able to boost their competitiveness (in the case of BLL).

- 2 In the *economic and financial* dimension, *citizens'* income from employment is higher and they spend less time on paperwork and journeys. *Recruiters* have access to information on financial aid for recruitment and training, they become more efficient and reduce the cost of searching for candidates and processing paperwork (Contrat@ system, SOC). The *public administration* improves efficiency, cuts the cost of managing services and obtains economies of scale gains by redirecting users from their offices to the website. The *government* makes financial savings on the provision of services and boosts the population's income. *Private agencies* benefit from lower costs and higher sales (BLL).
- 3 The *organisational and technological* advantages for the *public administration* include reorganisation, integration with databases, using telecommunication systems to share information, redesigning processes and human capital improvements. *Citizens*, thanks to the changes and new digital technologies (RSS, e-mail, web portal), can personalise their relationship with the employment system and enjoy greater accessibility and usability. *Companies* rationalise and integrate their internal processes and dealings with the public administration and enhance their human resources competencies. *Private agencies* can access information in shared databases (federated databases, BLL).
- 4 In terms of *services provision*, *citizens* perceive improvements in 24-hour service quality, transparency, the usefulness of information (e.g., how to write a CV, prepare a job interview, etc.), service fulfilment and satisfaction. Examples of this include easy-to-use browsers for finding job offers and training courses and the ability to personalise and monitor messages using RSS feeds. *Companies* improve accountability, the usefulness of information and levels of satisfaction (service fulfilment – problems solved, time saved). For example, this may include tools that facilitate finding the right candidate, funding for courses, signing contracts (Contrat@ system, SOC), etc. The *public administration* is able to better manage employment offers and requests and expand its range of 24-hour services (2.2 million services and procedures were performed by SOC in 2012). *Private agencies* have access to more legal and jobseeker information.
- 5 The *social* benefits for *citizens* include a simplified way to find a job and apply for unemployment benefits, greater transparency, accountability, privacy and development of new skills (disabled people, the long-term unemployed and young people). *Companies* are able to find the right person in a fair environment (particularly SMEs). The *government* enhances its reputation for fairness in service provision, higher levels of employment, income and social wellbeing. *Private agencies* can provide their services with greater equality (BLL).
- 6 In the *democratic and political* dimension, the stakeholders obtain openness and transparency while the *government* improves its reputation. *Citizens* can participate in electronic forums.

Table 4 Main impacts of labour market public web systems on the principal stakeholders (BLL and SOC cases)

<i>Dimensions</i>	<i>Citizens</i>	<i>Companies</i>	<i>Public administration</i>	<i>Government</i>	<i>Private agencies</i>	<i>Teaching companies</i>
Strategic	Lower risk of not finding a job and not having protection	Lower risk when hiring suitable employees	Employability (SOC), better service management decisions*, contribution to government objectives	Employability (SOC), better policy decisions*, reduced risk	Positioning in the sector (BLL)	
Economic and financial	Earning a salary, reduced transaction times	Efficiency, financial aid for hiring and training staff	Efficiency, management cost reduction, economies of scale gains, time to process, productivity	Less resources spent on service, higher population income and budget	Cost reduction, higher revenues (BLL)	Cost reduction*, higher revenues*
Organisational and technological	Quality, accessibility and usability, services available	Redesigned business processes, integration, human capital	Services organisation, integration*, redesigned processes*, human capital*		Redesigned processes, integration, human capital, federated database (BLL)	Processes integration*
Services	Service quality, information usefulness and satisfaction	Service quality, information usefulness, service fulfilment and satisfaction	Improved management of job offers and requests, service provision		Service quality, information usefulness, satisfaction	
Social	Having a job, new capabilities and privacy	Transparency, accountability*, job quality, fairness (SMEs)*		Social development, trust and confidence*	Fairness of service provision	Fairness of service provision*
Democratic and political	Openness* and transparency*	Openness* and transparency*		Accessibility, participation*, reputation*	Openness* and transparency*	Openness* and transparency*

Note: *Potential benefits.

Now, considering the relationship between the framework dimensions, sub-dimensions and indicators and benefits, the findings show that the main benefits the systems provide for BLL and the SOC correspond to the dimensions, sub-dimensions and indicators proposed in the framework based on eGovernment systems. This would support the validity of the proposed evaluation being carried out here for labour market systems. The benefits linked to the social and democratic-political sub-dimensions seem to have greater potential to be developed (according to the framework) as the systems become more mature and to be leveraged by governments and citizens.

The framework could *guide the design of new public service systems* for the labour market and help obtain the potential benefits that have been identified in the eGovernment systems. New developments would lead to higher levels of maturity in response to the stakeholders' changing needs.

Considering the potential impact of new public websites on the labour market and stakeholders, there are indications that other benefits may also be obtained from developing new systems to achieve a greater level of maturity, following the guidelines of the eGovernment models (marked with an asterisk in Table 4).

In the 'strategic' dimension, new versions of the system could improve decisions and reduce risks for the government and the public administration while boosting the positioning of private agencies. In the *economic and financial* dimension, private agencies could attain lower costs and higher sales. The *organisational and technological* dimension could yield benefits ranging from additional integration (i.e., teaching activities) and redesigned processes to new human capital capabilities. Increased *social* benefits such as accountability, job quality, fairness for companies (SMEs), confidence and trust for government and fairness of service provision for private agencies and teaching companies could all be achieved. Finally, in the *democratic and political* dimension, citizens, companies, private agencies and teaching companies could increase openness and transparency (i.e., when financial grants are offered, legal information on contracts, ...) and the government can achieve greater accessibility and participation while enhancing its reputation with more mature systems.

5.5 Discussion

From the analysis, it is clear that both the BLL and the SOC have used similar indicators yet show little interest in monitoring other indicators as proposed in our framework, despite the clear interest in providing citizens with services that meet their needs. Some of these indicators are related to the strategic dimension, the organisational and the technological dimension. Others are linked to the social, political and democratic dimensions, such as the confidence in government, the transparency and the participation indicators. Difficulties are evident with quantification and analyses and with the setup of factors and metrics able to provide a semi-formal and quantitative assessment of eGovernment. The number of monitored indicators seems to be lower than those we propose; yet the value dimensions, maturity levels and stakeholders included in our framework would appear to be useful in order to further develop and integrate public service evaluation for the labour market.

Concerning the level of integration of the existing assessment systems, the value of each SOC project is usually considered at the individual level and related to the service delivered, independently on whether ICT is used; that is, projects are not considered in an integrated about all the services provided. Hence, this does not allow obtaining a

complete vision of the impact of the used technologies or of the reengineered processes. Moreover, eGovernment assessment in the SOC is the responsibility of the ICT manager – located at an intermediate hierarchical level – whose staff regularly monitors a set of indicators and operates according to an ICT systems plan that reflects internal strategic directions. Nevertheless, diverse projects are developed and implemented in accordance with short-term plans, influenced by political needs, which aim to solve relevant problems and obtain substantial results. Instead, eGovernment assessment in BLL has been for a certain time the responsibility of organisation as well as of ICT managers, located at Agenzia Regionale per il Lavoro, an intermediate level between Top Regional Managers and the Regional Assessor to Labour. The staff monitored a set of indicators and operated according to a standard master plan for ICT reflecting the strategic directions.

We argue that the presented cases allow applying the proposed framework, based on eGovernment, to identify and validate other cases using the same indicators employed in the evaluation of other eGovernment systems. To do that, two steps can be followed. The first is the identification of indicators used by various stakeholders to check if those are already present in our framework. This is the main target of the research, and this phase is prevailing qualitative. Then, in a second, quantitative phase, which will be very relevant to obtain an evaluation and a benchmarking, we will proceed by giving values to the indicators. In fact, during the identification of indicators, we have carefully considered various employment data and the access modes to them, so as to permit their subsequent evaluation, actualisation and valorisation.

For the experimentation, and for the subsequent analysis, we have studied the year between 2006 and 2011/2012, when the two systems were operational. Also the historical perspective brings about a wider vision, better than giving to the study an immediate and punctual evaluation. We have applied the proposed framework to two different solutions, with different functions applying over two social, economic and political situations which are very similar. The similarities hold for a sufficiently long time to be analysed. In these conditions, the experiment consists in asking ‘Can two different systems, developed in diverse periods, give solutions to similar needs with the same or similar level of results?’. ‘Is the proposed framework valid to evaluate both systems?’ And also “Was BLL possibly too advanced with its development time?’ Possibly, this last aspect affects the value of some indicators. However, we think that neither the act of identifying indicators nor the precision degree necessary to estimate them truly affects the method of validation proposed here. However this consideration does not impact their identification nor the level necessary to reject the validation method regarding the proposed framework.

5.6 *Inadequacy of the methodology*

Several barriers to apply the proposed assessment framework and the methodological approach for benchmarking exist within the diverse dimensions of the cases analysed in our research. For instance, the adoption of assessment approaches that include the *strategic dimension indicators* may encounter restrictions due to the fact that the strategy definition is strongly conditional on political changes and also on changes in the strategic apex of public administration organisations after elections. Establishing long-term objectives in this context and also when several regions and public agencies are involved in related decision-making processes, is an important barrier to using formalised evaluation tools.

Other restrictions are related to the *economic and financial assessment* of projects provided by public administrations for employment services, mainly when intangible benefits are provided. Firstly, great difficulties exist identifying factors or components to be assessed in each public project, later when financial flows measurement due to the intangible nature of benefits and also to the political nature of these returns, and finally also to get the appropriate information from the information systems of the public administration because they have not been designed to reach these requirements.

There are also restrictions related to the huge complexity of the *organisational and technological dimension* that could exist in the great number of public administration departments and organisational levels. The impact on organisational structures and processes, resources, systems and ICT infrastructures and human capabilities are difficult to assess because of this organisational complexity, the inherited situation and the existing governance procedures. *Service quality* monitoring, with the main aim being to follow up new developments and operations, to assess the impact of eGovernment and ensure that the established agenda is implemented is perceived to be critical. While some evaluations exist, efforts carried out in this field seem not yet to be enough to develop a useful management process/tool, probably because of the existing cultural barriers in public administration.

Concerning the *social restrictions* related to the assessment of eGovernment labour market systems, it would appear that there is room to reach a maturity level because of the social context where the system is applied. At this systems development stage, some restrictions exist in terms of obtaining appropriate data. Similar difficulties are encountered regarding assessment of the *political and democratic dimension*. Developments related to this dimension are still at the initial stage and the related information systems that support the assessment seem to be correlated to this fact and far from a maturity level of the potential capabilities of the eGovernment systems.

Barriers to using an integrated framework for assessment are related to the fact that eGovernment systems for the labour market are still located at an introduction and diffusion level, with stakeholders learning how to use them efficiently and effectively and identifying the objectives these systems could better contribute to. The technological infrastructures already in place and the services already being provided are far from contributing to the main goals of politicians nowadays. Hence, developing a formal set of key indicators to assess eGovernment systems and employment services provision, mainly in the social and the political and democratic dimensions, is not perceived as the current focus.

The fact that top managers were not involved in allocating resources and in setting long-term priorities for eGovernment systems results in the creation of barriers in using the formalised set of indicators for the labour market as proposed here. Delegating these responsibilities to intermediate hierarchical levels in the organisation may be seen as non-explicit support for the highest positions in evaluating eGovernment systems and making the creation and monitoring of such indicators difficult.

There is also a certain resistance and lack of commitment among internal system users in terms of exploiting eGovernment and in improving specific services. This is partly attributable to the prevailing culture in the public administration, which aims at complying with existing regulations and minimising change. This contributes as a barrier to the implementation of a formal assessment system.

6 Conclusions

A culture of measurement is increasingly being applied in public administrations in general and should be applied to the BLL and SOC systems too. Formal processes were introduced several years ago for office managers in order to enhance performance in terms of activities, service quality and staff training. Projects are developed in order to assess content of the strategic, social and political and democratic dimensions. However, even though a number of projects have been developed recently related to the political and democratic dimensions (such as those related to networking and social control in order to identify the main user needs and to obtain feedback on services), no assessment has been carried out as yet. In our research we found that the framework obtained from eGovernment assessment and adapted to the labour market might be a useful tool.

References

- Arendsen, R., Peters, O., Ter Hedde, M. and van Dijk, J. (2014) 'Does e-government reduce the administrative burden of businesses? An assessment of business-to-government systems usage in the Netherlands', *Government Information Quarterly*, No. 31, pp.160–169.
- DeLone, W.H. and McLean, E.R. (2003) 'The DeLone and McLean model of information systems success: a ten-year update', *Journal of Management Information Systems*, Vol. 19, No. 4, pp.9–30.
- eGEP (2006) *Measurement Framework Final Version*, eGovernment Economics Project, European Commission, Brussels.
- Esteves, J. and Joseph, R.C. (2008) 'A comprehensive framework for the assessment of eGovernment projects', *Government Information Quarterly*, No. 25, pp.118–132.
- Freeman, R.E. (1984) *Strategic Management: A Stakeholder Approach*, Pitman, Boston.