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**DEVELOPMENT OF AN EVALUATION MODEL FOR EMPLOYMENT
INFORMATION SYSTEMS**

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ABSTRACT

In recent years, the development of ICT has become an important strategy for the improvement of the relationship between government, citizens and companies. For this reason, there is a need to develop better information systems in areas such as the one of public services, but there is limited knowledge and best practices about how to measure the quality and efficiency of the initiatives in this area.

This document contains a research about E-Government theory and the current state of methodologies developed to evaluate E-Government initiatives. These methodologies are supported by the contributions of different authors and have been the base to develop our evaluation framework. Combining the different proposals analyzed in the research, we propose and validate an *evaluation model for Employment Information Systems (EIS)*, which integrates three main different types of analyses: *Environment*, *Stakeholders* and *Internal analysis of the EIS*. Our proposal is applied to two EIS, Servei d'Ocupació de Catalunya (SOC) and Borsa Lavoro Lombardia (BLL), operating in two Regions, Lombardia in Italy and Catalonia in Spain.

In a general result, we found that our model captures a picture of the context in which the EISs analyzed operate, guaranteeing a better understanding of the behavior of an EIS as well as of the context and environment where it operates, because the model not only allows measuring different external factors such as economic, social and employment trends but also provides measures about the technical and functional characteristics of the system, generating ideas and/or hypotheses about the variables that that can affect or benefit the general performance EIS.

SOMMARIO

Negli ultimi anni, lo sviluppo dell'Information Technology è diventata una strategia importante per il miglioramento del rapporto tra governo, cittadini e imprese. Per questo motivo, vi è la necessità di sviluppare sistemi informativi in settori quali i servizi pubblici. Tuttavia, esistono poche informazioni su come misurare la qualità e l'efficienza delle iniziative nell'area dei servizi pubblici forniti dalle pubbliche amministrazioni.

Questa tesi contiene la nostra ricerca sulla teoria relativa all'E-Government e in particolare sullo stato attuale delle metodologie sviluppate per *valutare iniziative di E-Government*. Queste metodologie sono supportate dai contributi di diversi autori e sono alla base del nostro quadro di valutazione. Combinando le diverse proposte analizzate nella ricerca, proponiamo un modello di valutazione per i sistemi informativi per il lavoro (*Employment Information Systems - EIS*) che integra tre principali tipi di diverse analisi: *Ambiente*, *Stakeholders* e *Analisi Interna* di un EIS. Il modello è applicato a due EIS, *Servei d'Ocupació de Catalunya (SOC)* e *Borsa Lavoro Lombardia (BLL)*, operanti rispettivamente in Regione Lombardia, Italia, e in Catalogna, Spagna.

Come risultato generale, abbiamo riscontrato che il nostro modello cattura un'immagine del *contesto* in cui questi due sistemi operano, garantendo una migliore comprensione del comportamento di un EIS, perché il modello permette non solo misurare diversi fattori esterni, ma fornisce anche concetti riguardo all'impostazione del sistema e permette di generare idee e /o ipotesi sulle variabili che influenzano un EIS per i servizi all'impiego e di capire come se ne può trarre beneficio.

1 INTRODUCTION

The development of ICT has increased the interest of different countries in the area of E-Government, because this is already considered as an important strategy of administration and transformation of the relationship between government, citizens and companies. Nowadays, there is a huge need for develop better information systems in areas as public services, but there is limited information about how to measure the quality and efficiency of the initiatives in this area. Recent efforts have developed several methodologies with different approaches with own metrics and / or shared variables, however this still being an unexplored area because currently does not exist a methodology that allows a flexible and comparative measurement of E-Government systems.

Therefore, with a methodology to evaluate E-Government initiatives will be possible to measure and assess not only the technical characteristics of the system, but also the different external aspects that could influence the development and the operation of the system. This evaluation model would allow understanding why an information system shows a good or poor performance compare to others and, consequently, it would be useful to compare the countries and/or regions where the systems operate, in order to be a supporting tool in the decision making process for the government.

For this reason, the present study seeks to propose a more complete evaluation model, which would be able to incorporate different approaches and variables addressed by previous studies. In order to validate the model two case studies, SOC and BLL Systems, have been used to analyze the boundaries and scope of the proposed framework. Taking into account that these case studies are based on Employment Information Systems (EIS), an analysis of these systems also is developed in our literature review.

Consequently, the general objective of this work is to analyze the current state of the art of E-Government tools, how these can be measured and propose a new model to evaluate them, specifically EIS. To achieve this objective, we have followed a methodology of bibliographic research, which have been the base to create a proposal with an evaluation model that will be applied to two case studies.

The present work is divided in the next chapters:

Chapter 2. Literature Review

Analyzes the current literature and researches available related to E-Government, Employment Information Systems and current models for evaluate Information Systems, looking for identifying improvement opportunities that can contribute to a better evaluation model.

Chapter 3. Development of a New Evaluation Model

Establishes an evaluation model of EIS that can be implemented and used as a guide in order to assess E-Government initiatives. The model should allow understand and analyze the EISs based on the performance and external aspects.

Chapter 4. Cases Studies

Tests the model proposed by its application to real case studies. It presents the results obtained of each EIS, SOC and BLL.

Chapter 5. Analysis of Results

Analyzes the results obtained in the application of the proposed model, generating conclusions based on a comparison between the case studies.

Chapter 6. Conclusions

Exposes a set of conclusions about the proposed model based on the fulfillment of the literature gaps and the application and validation of the model in the practical cases. The chapter concludes with the suggestion of possible research topics for future works.

2 LITERATURE REVIEW

2.1 E-GOVERNMENT

2.1.1 Definition

According to Relyea (2002), the concept of Electronic Government (E-Government) was initially coined in the report "Access America: Reengineering Through Information Technology", a document developed jointly by the National Performance Review and the Government Information Technology Services Board in 1997, in United States.

Originally, E-Government was conceived to describe the use of Information Technology developments inside the government entities, in order to control and improve the information given and received by citizens, but since then, the term has been defined in different ways by various authors:

- For Kaylor (2001), *"E-Government ... is taken to be the ability for anyone visiting the city website to communicate and/or interact with the city via the Internet in any way more sophisticated than a simple email letter to the generic city (or webmaster) email address provided at the site."*
- E-Government is defined as *"utilizing the Internet and the World-Wide-Web for delivering government information and services to citizens"*, (United Nations (UN) and American Society for Public Administration (ASPA) (2002)).
- The definition given by the OECD (2003) defines E-Government as *"the use of ICTs, and particularly the Internet, as a tool to achieve better government"*.
- Jaeger (2003) incorporates other ICTs in addition to the Internet and the Web, *"database, networking, discussion support, multimedia, automation, tracking and tracing, and personal identification technologies"*.
- 'Digital Government' is the term adopted by Fountain (2001) instead of E-Government. *"Digital government ... is a government that is organized increasingly in terms of virtual agencies, cross-agency and public-private networks whose structure and capacity depend on the Internet and Web"*
- Means and Schneider (2000) have define E-Government as *"the relationships between governments, their customers (businesses, other governments, and citizens), and their suppliers (again, businesses, other governments, and citizens) by the use of electronic means."*
- Similarly, Mike Hernon (Duffy 2000) defines E-Government as *"simply using information technology to deliver government services directly to the*

customer 24/7. The customer can be a citizen, a business or even another government entity”

- E-Government is defined as *“the use of technology, especially Web-based applications to enhance access to and efficiently deliver government information and services”* by Brown and Brudney (2001).

All these definitions can be summarized in the definition given by David McClure (2000), *“Electronic government refers to government’s use of technology, particularly web-based Internet applications to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and government entities. It has the potential to help build better relationships between government and the public by making interaction with citizens smoother, easier, and more efficient. Indeed, government agencies report using electronic commerce to improve core business operations and deliver information and services faster, cheaper, and to wider groups of customers.”*

This final definition takes into account that E-Government is a tool that should be used for Governments and its institutions, easily reachable for their citizens, providing information and services to create better relationships and to cover needs and requirements in a complete and easy way, using IT as a supporting instrument, particularly web-based Internet applications.

2.1.2 Models of development stages for E-Government

In order to understand the evolution of E-Government around society, many authors have established different models to explain the level of development reached with the systems created, and also to measure the quality, efficiency and effectiveness of these systems and the services delivered to the citizens.

- Layne and Lee (2001) presents a model that classifies the development in four stages that measure the degree of complexity involved and the level of integration reached. The four stages proposed are: (1) cataloguing, (2) transaction, (3) vertical integration, and (4) horizontal integration. Figure 1 shows this model.

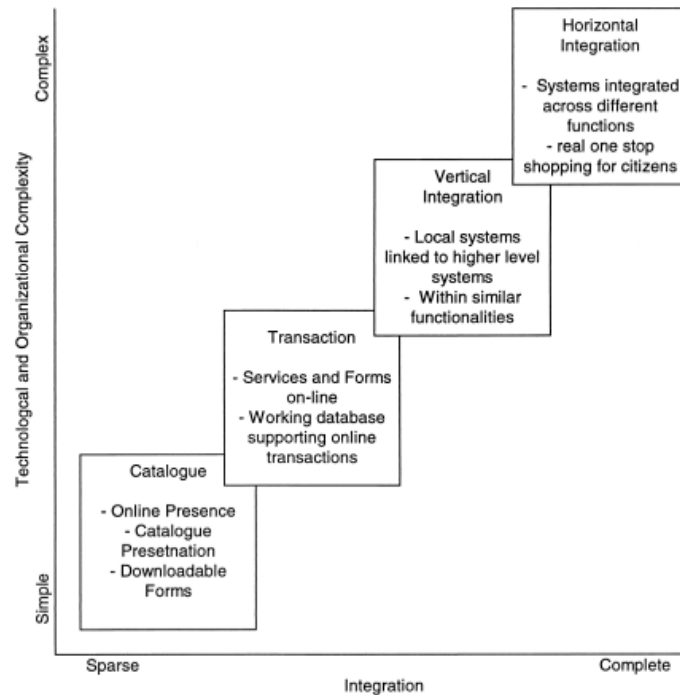


Figure 1. Dimensions and stages of E-Government development. Source: Layne, K. & Lee, J. (2001).

1. **Cataloguing:** in the first stage, governments create a “website” as part of the demand generated by society and new technologies. At this level, the services offered are limited to the access of information and procedures, but doesn’t exist any level of transaction or interaction between the institutions and the citizens. This is a one-way communication system.
2. **Transaction:** at this level, governments offer not just a “cataloguing information system”, but also transaction services, where citizens don’t need to go to the offices to perform the traditional paperwork, instead they can fulfill the same requirements accessing the website and using the on-line services offered. This approach saves time, money and facilitates the contact of the people with their governmental institutions. This creates a two-way communication system.
3. **Vertical Integration:** in this stage, governments are not just offering the same services in an on-line version, but they are transforming the services as well. At this point, the interaction of the citizens is not only possible with a specific institution, but now there’s an integration between the different governmental offices, which allows citizens an easiest access to services and information from different agencies, and also provides to governments a complete and more reliable information system, where databases are shared and electronic data is interchanged in a transactional way.
4. **Horizontal Integration:** in the final stage, the integration level not only covers public institutions, but also includes private agencies. In this

phase, citizens and government institutions have access to an integrated system, where they can access information and perform transactions along diverse offices using a central portal based on centralized databases.

- The United Nations and the American Society for Public Administration, proposed a second model where the E-Government development is divided in five stages. (UN & ASPA. (2002). Benchmarking E-Government: A global perspective.)
1. **Emerging presence:** in the governmental web sites, citizens can access to official but static and limited information and procedures.
 2. **Enhanced presence:** in this level, web sites have been modernized and provide a more dynamic access to constantly updated information, but remains as a one-way communication system.
 3. **Interactive presence:** at this point, web sites have been reach an advanced stage, offering an interaction between citizens and institutions, where users can download forms and is possible to establish a on-line communication with officials.
 4. **Transactional presence:** in this stage, web sites offer to users the possibility of processing complete and secure transactions on-line. Citizens are able to perform payments, update personal information or ask for renewal of documents.
 5. **Seamless or fully integrated presence:** all governmental web sites are connected, using a unique and central portal to perform requests and access to services and information.

These two models were unified by Schelin (2003), who recognized the overlapping between them, and summarize their stages as shown in Table 1.

Stage	Orientation	Services	Technology	Citizens
Stage 1: Emerging Web presence	Administrative	Few, if any	Only Web	Going it alone
Stage 2: Enhanced Web presence	Administrative, information	Few forms, no transactions	Web, e-mail	Links to local agencies
Stage 3: Interactive Web presence	Information, users, administrative	Number of forms, online submissions	Web, e-mail, portal	Some links to state and federal sites
Stage 4: Transactional Web presence	Information, users	Many forms and transactions	Web, e-mail, digital signatures, PKI, portals,	Some links to state and federal sites

			SSL	
Stage 5: Seamless Web presence	Users	Mirror all services provided in person, by mail and by telephone	Web, e-mail, PKI, digital signatures, portal, SSL; other available technologies	Crosses departments and layers of government

Table 1. Schelin Stages. Source: Schelin (2003), adapted from UN and ASPA (2002) and Ho (2002). (Yildiz 2007)

According with these models, E-Government is viewed as a tool to access information and perform on-line activities that before were only possible to do in a personal way in a governmental office. The last stage of development reached for these models; establish that users are able to execute transactions in a complete and secure way. For other authors, exists one more level of development: on-line political participation for citizens.

- Keng Siau and Yuan Long (2005), proposed a model with five levels:
 1. **Web presence:** web sites in this stage, offer access to information in a limited and simple way, where data is static.
 2. **Interaction:** at this point, web sites offer a basic interaction between citizens and their institutions, including some downloads, e-mail communication and search engines.
 3. **Transaction:** in this level, web sites provide an interaction more advanced to users, where they can perform on-line transactions without to move to governmental offices.
 4. **Transformation:** this stage covers the integration between different levels and institutions, involving vertical and horizontal services. At this level, governments have a main portal with a central database.
 5. **E-democracy:** E-Government in this stage allows to citizens to interact and make political decisions through on-line services.

- M. Jae Moon (2002) proposed a five-stage model, based on Hiller and Belanger's model (2001). This model consists in these phases:
 1. **Simple information dissemination (one-way communication):** information is basically posted in web sites, being the simplest way of present E-Government.
 2. **Two-way communication (request and response):** citizens and governmental institutions interact through a two-way communication form.

3. **Service and financial transaction:** individuals can perform different activities on-line, as payments or visa petitions, in a complete and secure transaction.
4. **Vertical and horizontal integration:** as showed by Layne and Lee (2001) in the last two stages of their four-stage model, this phase covers the integration between public and private offices.
5. **Political participation:** this level allows citizens to participate in political activities, as on-line voting and surveys.

In general, these models try to measure governmental web sites according with the number and the level of complexity of the services offered online. All the models propose different stages, very similar between them, trying to provide a general framework capable to measure the degree of development reached for a specific E-Government system.

2.1.3 Subcategories of E-Government based on e-Commerce relationships

Using the categories proposed to classify relationships in e-Commerce have been developed similar categories to divide E-Government relations. The interactions have been grouped as: government and citizens (G2C), government and business enterprises (G2B) and inter-agency relationships (G2G).

- **G2C – Government to Citizen:** in this category are grouped those activities in which citizens are able to interact with governmental agencies, performing activities as payment of taxes, renewal of licenses, updating of personal information, fulfilling forms or simply asking questions and receiving answers. Additionally, services as health appointments, tourism and recreation, and employment services are classified in this category.

In the same way, C2G (Citizen to Government) is related to the information received by governments and delivered by citizens.

- **G2B – Government to Business:** this group refers to the interaction between governments and their suppliers using ICTs, specially Internet-based applications. This definition cover the two two-way interrelationships: G2B and B2G. B2G is related to the services provided by business to governmental institutions and in the case of G2B refers to the services acquired by governments from private agencies.
- **G2G – Government to Government:** this interaction is related to the different activities that take place between government organizations. The aim of this relation is to improve the effectiveness and efficiency of the whole government, creating an integrated environment to share services and data, which generate a more complete governmental system.

Fang (2002) summarized these E-Government characteristics as in Table 2.

Items.	Information	Communication Online	Transaction.
G2C and C2G ..	Information requests of a firm or the citizen regarding taxes, business licenses, registers, laws, political programs, administrative responsibilities, etc..	Information requests and discussion regarding administrative processes and products; communication with politicians, authorities etc.	Online delivery of service and posting of results; electronic voting, providing solution online, and participation online, etc..
G2B and B2G ..	Information requests of a firm or the citizen regarding taxes, business licenses, registers, laws, business programs, business policy, administrative responsibilities, etc..	Information requests and discussion regarding administrative processes for business and products; communication with politicians, authorities, etc.	Online delivery of service and posting of results; electronic transactions of accounting, e-auditing, e- procurement, e- shopping, etc..
G2G	Exchange of information among different authorities and different hierarchical levels, regarding administrative acts and laws, policy making, data, projects or programs, background information to decisions, etc.	Information is exchanged among different authorities and different hierarchical levels; discussion fora; communication in negotiation and decision making; interaction regarding administrative acts and laws, projects or programs, etc.	Inter-organizational workflow and exchange of data, exchanging policy and solution online, information and knowledge management, etc.

Table 2. Characteristics of Types of E-Government. Source: Fang, Z. (2002)

2.1.4 Issues and challenges

The transition to E-Government for Governments has faced many challenges, because the conversion from personal to virtual processes has implied the construction of a lot of Web-based applications to replace current procedures, forcing governmental agencies to modify procedures and actualize and trained officials.

These issues have been studied for many authors, and some of the results are presented below.

- Andrea DeBenedictis (2002) has found that the main issues affecting the E-Government development are:

CHALLENGES	RISKS TO GOVERNMENT	RISKS TO CONSTITUENTS
Privacy	<ul style="list-style-type: none"> • Erosion of confidence and trust in government 	<ul style="list-style-type: none"> • Encroachment on personal freedoms
Security	<ul style="list-style-type: none"> • Loss or misuse of data • Erosion of confidence and trust in government 	<ul style="list-style-type: none"> • Loss or misuse of information
Costs	<ul style="list-style-type: none"> • Low return on investment • Resource scarcity 	<ul style="list-style-type: none"> • Higher taxes • Higher charges for services
Technical Issues	<ul style="list-style-type: none"> • Inadequate infrastructure • Obsolete technology • Poor scalability 	<ul style="list-style-type: none"> • Lack of accessibility • Lack of usability • Lack of necessary skills and knowledge
Competition	<ul style="list-style-type: none"> • Duplicated activities across agencies • Territorial conflicts • Conflicts of interest 	<ul style="list-style-type: none"> • Inability to compete
Empowerment	<ul style="list-style-type: none"> • Hyper-responsive government (over-government, unfocused government) • Loss of governing control 	<ul style="list-style-type: none"> • Information overload
Accessibility	<ul style="list-style-type: none"> • Disenfranchisement of disabled, low-income, non-English speakers, and other disadvantaged constituents • Widening the digital divide 	<ul style="list-style-type: none"> • Disenfranchisement

Table 3. Major Challenges of E-Government. Source: Andrea DeBenedictis (2002)

- Ndou (2004) identifies some challenges during a research of E-Government for developing countries. The main issues founded and their definitions are:

1. **ICT infrastructure (e-readiness, computer literacy, telecommunication equipment):** *The development of basic infrastructure to capture the advantages of new technologies and communications tools is essential for implementing E-Government. Different access methods, such as remote access by cellular phones, satellite receivers, kiosks, etc., need to be taken into consideration by governments in order that all members of society can be served irrespective of their physical and financial capabilities.*
2. **Policy issues (legislation):** *Processing of E-Government principles and functions requires a range of new rules, policies, laws and legislative changes to address electronic activities including electronic signatures, electronic archiving, freedom of information, data protection, computer crime, intellectual property rights and copyright issues.*
3. **Human capital development and life long learning (skills, capabilities, education, learning):** *A major challenge of an E-Government initiative is the lack of ICT skills in the public sector... E-Government requires hybrid human capacities: technological, commercial and management. Technical skills for installation, maintenance, designing and implementation of ICT infrastructure, as well as skills for using and managing online processes, functions and customers, are necessary.*
4. **Change management (culture, resistance to change):** *Change management issues must be addressed as new work practices, new ways of processing and performing tasks are introduced. E-Government correctly designed doesn't simply save costs and improve service quality; instead it revolutionizes and reinvents the government processes and functions.*
5. **Partnership and collaboration (public/private partnership, community and network creation):** *Collaboration and cooperation at local, regional and national levels, as well as between public and private organizations, are important elements in the E-Government development process. Nevertheless, collaboration and cooperation are not simple to realize. Governments often exhibit considerable resistance to open and transparent systems as they try to preserve their authority, power and hierarchical status. Citizens distrust their governments, especially where there has been a history of dictatorship, political instability or large-scale corruption.*
6. **Strategy (vision, mission):** *Every project or initiative needs to be rooted in a very careful, analytical and dynamic strategy. ... Many public institutions limit their activities to a simple transfer of their information and services online without taking into consideration the re-engineering process needed to grasp the full benefits.*
7. **Leadership role (motivate, involve, influence, support):** *Leadership is one of the main driving forces of every new and innovative project or initiative. Since E-Government is a complex process, accompanied by high costs, risks and challenges, public organizations are generally resistant to the*

initiation of change. A leading player (organization, institution), which is able to understand the real costs and benefits of the project, to motivate, influence, include and support other organizations and institutions, is required.

These studies show that e-Government carried a lot of difficulties in three main fields: technical, economical and social, that should be faced and counteracted in order to reach an appropriate system that covers all the needs of Governments and their Citizens.

2.2 LABOR MARKETS AND ACTIVE LABOR MARKET POLICIES

2.2.1 Labor Market and Active Labor Market Policy Definition

A labor market is a place where companies and employees interact between them. In this space, employers compete to hire the best workers, and people compete to get the best job offer.

In this context, over the past 40 years has been developed the concept of Active Labor Market Policy. This strategy is the result of different public work projects created to study and try to reduce the global unemployment rates during the interwar period. The most recognized authors related to this program are the economists Lars Calmfors and Richard Layard.

According with Calmfors (1994), this policy can be defined as: *“measures in order to improve the functioning of the labor market that are directed towards the unemployed. Active labor market policy will then comprise three basic subcategories: i) job broking with the purpose of making the matching process between vacancies and job seekers more efficient; ii) labor market training in order to upgrade and adapt the skills of job applicants; and iii) direct job creation, which may take the form of either public-sector employment or subsidization of private-sector work”*.

In a journal for The World Bank, Amit Dar (2002) defined that the main objective of this programs is Economic: *“to increase the probability that the unemployed will find jobs or that the underemployed will increase their productivity and earnings”*. These programs cover the whole process of job achievement, including *“job search assistance, training and retraining, and job creation programs (public works, micro-enterprise development, and wage subsidies)”*.

2.2.2 Active Labor Market Policy categories

The Active Labor Market Policies can be divided in six categories, according with the Europe 2020 Strategy developed by the European Commission (2014). This classification is based on the frameworks proposed by the OECD and Eurostat. These categories are:

1. **Labor market services:** related to job-search assistance programs, facilitating employment hunt and conservation of the jobs obtained.
2. **Training:** offering training programs open up a wide set of possibilities for unemployed people.
3. **Employment incentives:** use of incentives to motivate companies to hire new people or to create new positions.
4. **Supported employment and direct jobs:** this create access to jobs positions to Long Term Unemployed, young people or groups that are facing integration problems with the regular labor market.
5. **Start-up incentives:** this is related to the creation of new companies and the execution of new ideas for entrepreneurship.
6. **Youth measures:** jobs positions aren't normally directed to young people, this instrument tries to measure the capacity of the policies to integrate youth to the labor market.

2.2.3 Active Labor Market Policy in the European Union

Along the EU and the other European countries, is possible to find many programs based on Active Labor Market Policy (ALMP in what follows). All these initiatives and their level of expenditure can be classified into six categories according with the research developed by Kluge (2006). The proposed classification is similar to the classification showed above, which was suggested by the OECD and Eurostat.

The taxonomy exposed by Kluge (2006) is showed below:

1. **(Labor market) training**, encompasses measures like classroom training, on-the-job training and work experience. The measures can either provide a more general education (e.g. language courses, basic computer courses or other basic courses) or specific vocational skills (e.g. advanced computer courses or courses providing e.g. technical and manufacturing skills). Their main objective is to enhance the productivity and employability of the participants and to enhance human capital by increasing skills.
2. **Private sector incentive programs** comprise all measures aimed at creating incentives to alter employer and/or worker behavior regarding private sector employment. The objective of subsidies is to encourage employers to hire new workers or to maintain jobs that would otherwise be broken up.
3. **Direct employment programs in the public sector** focuses on the direct creation and provision of public works or other activities that produce public goods or services. These measures are mainly targeted at the most disadvantaged individuals, pursuing the aim to keep them in contact with the labor market and preclude loss of human capital during a period of unemployment.

4. **Services and Sanctions** encompasses all measures aimed at enhancing job search efficiency. The public employment services (PES) often target the disadvantaged and long-term unemployed, whereas private services focus on the more privileged employees and white-collar workers. These programs are usually the least expensive. Benefit sanctions (e.g. reduction of unemployment benefits) are imposed in some countries if the monitored job search behavior of an unemployed is not sufficient or if he refuses an acceptable job offer.
5. **Youth programs** comprise specific programs for disadvantaged and unemployed youth, including training programs, wage subsidies and job search assistance.
6. **Measures for the disabled** include vocational rehabilitation, sheltered work programs or wage subsidies for individuals with physical, mental or social disabilities.

Generally, the programs developed by different countries use jointly two or more of these categories, trying to generate a complete and integrated strategy to avoid and reduce the unemployment rates. For example in Sweden the program combines training and job creation (Calmfors (2002)).

Lately, the application of the ALMPs has increased notably in Europe, behavior that can be measure with the amount of money invested in different programs and strategies. Table 4 shows the percentage of GDP spent in labor market policies by the country members of the OECD. Figure 2 shows the total expenditure of European countries on ALMPs.

	PES and administration	Training	Job rotation and job sharing	Employment incentives	Supported employment and rehabilitation	Direct job creation	Start-up incentives	Out-of-work income maintenance and support	Early retirement	Total
Austria	0.18	0.45	0	0.03	0.03	0.05	0.01	1.12	0.15	2.03
Belgium	0.21	0.15	0	0.72	0.14	0.37	0	1.38	0.71	3.68
Czech Republic	0.1	0.01	0	0.04	0.09	0.03	0	0.28	0	0.56
Denmark	0.67	0.5	0.01	0.39	0.69	0	0	1.33	0.31	3.91
Estonia	0.08	0.09	0	0.04	0	0	0.01	0.5	0	0.73
Finland	0.17	0.51	0.05	0.07	0.1	0.09	0.02	1.3	0.16	2.49
France	0.25	0.36	0	0.06	0.07	0.14	0.05	1.4	0.01	2.34
Germany	0.34	0.26	0	0.06	0.03	0.03	0.07	0.98	0.05	1.82
Greece	..	..	..	..	..	..	..	..	..	..
Hungary	0.01	0.03	0	0.1	0	0.22	0.01	0.66	0	1.02
Ireland	..	..	..	..	..	..	..	..	..	..
Italy	0.11	0.14	0	0.15	0	0.01	0.01	1.28	0.08	1.78
Luxembourg	0.05	0.04	0	0.35	0.01	0.11	0	0.49	0.15	1.2
Netherlands	0.41	0.13	0	0.01	0.44	0.11	0	1.63	0	2.74
Norway	..	0.19	0	0.05	0.17	0.05	0	0.41	0	..
Poland	0.08	0.01	0	0.09	0.19	0.01	0.03	0.2	0.11	0.72
Portugal	0.14	0.32	0	0.1	0.02	0.01	0	1.23	0.11	1.93
Slovak Republic	0.07	0	0	0.1	0.04	0.01	0.07	0.25	0.25	0.79

Slovenia	0.11	0.08	0	0.04	0	0.07	0.06	0.87	0	1.23
Spain	0.15	0.2	0.01	0.25	0.08	0.08	0.11	2.79	0.04	3.71
Sweden	0.29	0.08	0	0.45	0.25	0	0.02	0.63	0	1.72
Switzerland	0.12	0.18	0	0.07	0.22	0	0.01	0.53	0	1.12
United Kingdom	..	..	0	..	..	..	0	..	0	..

Table 4. Public expenditure of LMP by main categories (% GDP). Source: OECD.Stat. Data extracted on 09 Apr 2014 20:08 UTC (GMT)

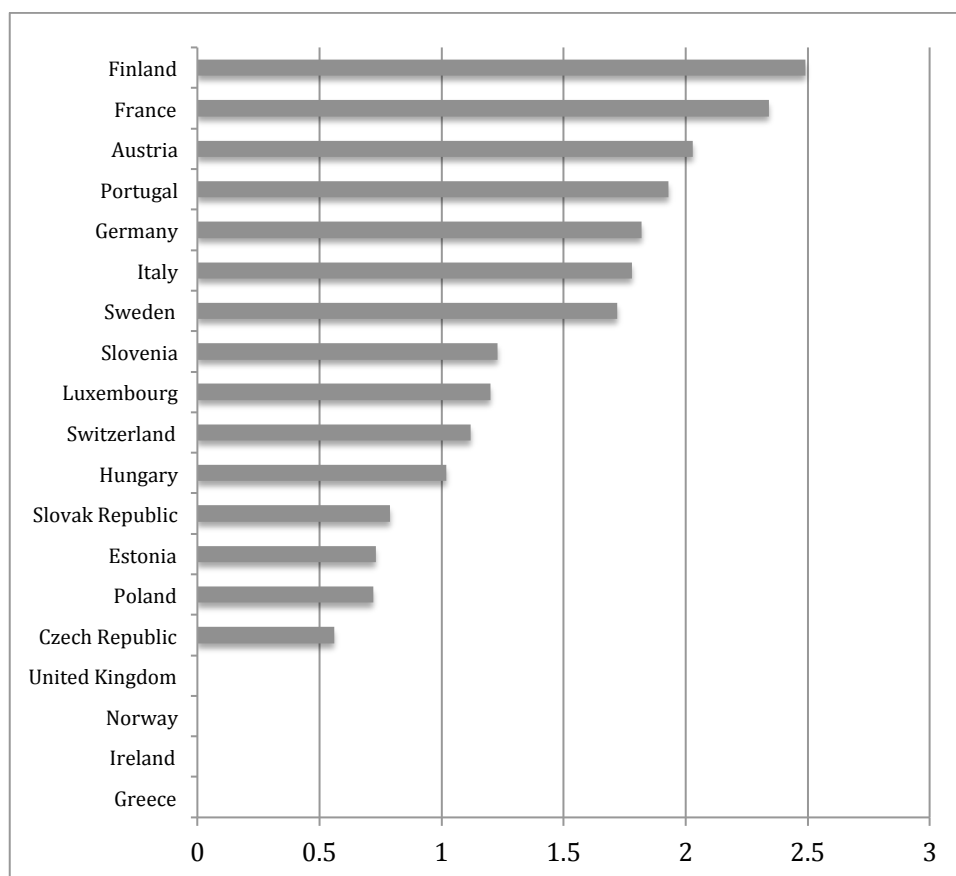


Figure 2. Total Spending on ALMPs on 2011. Source: OECD.Stat. Data extracted on 09 Apr 2014 20:08 UTC (GMT)

The most representative cases are Denmark, Spain and Belgium, which are spending almost 4% of their GDP in policies related to Labor Market. In contrast, countries like United Kingdom, Norway, Ireland and Greece, are spending less than 0.5% of their GDP, showing a little interest in the application of these policies.

Using the categories proposed by Kluge, and crossing them with the programs measured by the OECD, is possible to obtain a general view of the percentage of GDP invested by European countries in ALMPs. In Figure 3 is presented the percentage of investment on these programs.

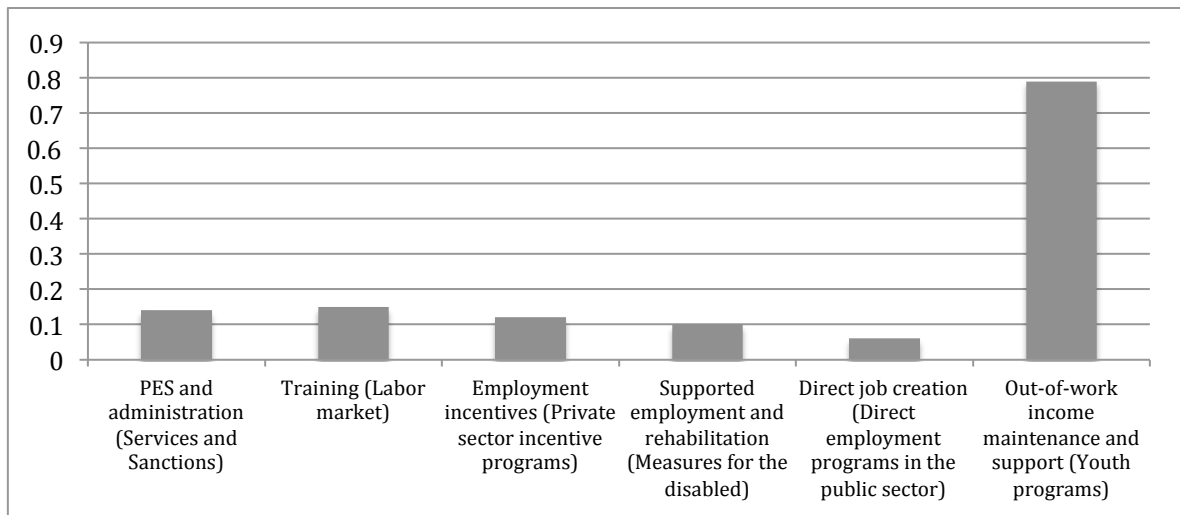


Figure 3. Percentage of GDP invested by OECD program (Kluve category). Source: OECD.Stat. Data extracted on 10 Apr 2014 10:22 UTC (GMT).

These data show a general view of the work developed by European countries in 2014, in order to create and support programs related to improve their labor markets.

2.2.4 Active Labor Market Policy in Spain

Spain has shown an important growing in its investment of ALMPs. The evolution of Spaniard policies can be summarized as:

- Between 1985 and 1992, the policies were focused on temporary contract of employment promotion and on incentives for training contracts. The permanent recruitment of young population was important in the period 1985-1988.
- In the period 1992-1997 the budget dedicated to employment aids was decreased, highlighting temporary contracts that could be converted into permanent ones. This latter case was limited only to training contracts.
- Since the 1997's reform, the budget for employment aid was increases again. This was reflected in the number of contracts registered promoting permanent employment. This change increased the recruitment of young people, people older than 45 years and people unemployed for a long duration.
- However, since 2001 the weight of the recruitment of young people decreased substantially due to changes in incentives that used to promote this policy.
- In the last decade, the government has been promoting different policies in order to counteract the economical crisis that has been affecting Spain.

In the data presented by OECD, it is possible to observe the growing in the investment made in ALMPs for the Spaniard government in the last years (Table 5).

	2004	2005	2006	2007	2008	2009	2010	2011
PES and administration	0.12	0.13	0.13	0.13	0.13	0.17	0.17	0.15
Training	0.15	0.17	0.16	0.15	0.17	0.19	0.2	0.2
Job rotation and job sharing	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Employment incentives	0.29	0.29	0.32	0.27	0.23	0.22	0.26	0.25
Supported employment and rehabilitation	0.03	0.02	0.02	0.06	0.07	0.07	0.08	0.08
Direct job creation	0.11	0.09	0.08	0.08	0.09	0.1	0.1	0.08
Start-up incentives	0.04	0.06	0.08	0.09	0.11	0.1	0.12	0.11
Out-of-work income maintenance and support	1.46	1.42	1.39	1.4	1.82	2.94	3.11	2.79
Early retirement	0.04	0.04	0.05	0.06	0.07	0.06	0.04	0.04
TOTAL	2.25	2.24	2.23	2.25	2.7	3.86	4.08	3.71

Table 5. Public expenditure as a percentage of GDP in Spain. Source: OECD.Stat. Data extracted on 10 Apr 2014 10:56 UTC (GMT).

This shows the interest of the Spaniard government in improving the opportunities of its workers and looks for a better labor market that helps to overcome the actual crisis, but still, the policies are focused to employment aids and not to active programs.

2.3 EMPLOYMENT INFORMATION SYSTEMS

ICT has changed the way that the jobs are done because it helps to the firms to enter in a new market, generate new trends, develop new skills and competences. Therefore, the workers need a constant search about what to do, how to train, how improve their abilities and their jobs. The introduction of ICT in the labor market has facilitated the access to the information about individual and collectives requirements of the society. The tools used to collect this data are called Statistical Information Systems (SIS), which use the administrative sources such as government registries and tax registries. SIS are used in systems to tackle unemployment problems and expand the labor market, these are the employment information systems, which are systems in charge to manage the public and private employment services. In this section, these concepts are going to be explained and some cases are given.

Public Employment Services (PES) offer facilities for job recruitment/placement marketplace where the citizens can be assisted during their insertion or re-insertion in the labor market. The final objectives are to increase the employment rate, to guarantee a sustainable job quality, and to assure equal opportunities (Fugini, 2009). For that reasons, PES use different tools in order to carry out these goals. One of the main tools is an Employment Information System.

Employment Information System is a web-based data collection system that districts will use to report employment (including demographics), position, and salary data for individual employees (<http://www.isbe.net/EIS/ppt/EIS-design-function-pres011713.pdf>). It is implemented with the aim of supporting the labor market and automating the job seeking and offering procedures. Its mission is to provide information, insertion, guidance, economic support, and training and labor mobility. It allows registering requests and offers (R/O) Jobs and monitoring the job market trends based on Statistical Information Systems (SIS).

2.3.1 Description of the Process

In general, a typical recruitment process start with a description of the requirements of the job request, then the job request is published, the candidates apply to the job and finally a final decision is made (Fugini, 2009). The scenario of an Employment Information System, shown in the figure 1 is compose by: 1) End-users which are citizens, companies, public administrations (PA), centers of employment, private work agencies, and educational institutions. 2) A Service Model where the information related to CVs, job R/O and Educational Programs is loaded by the end-users and based on a structure network by different levels national, regional or local, and 3) Statistical Information System (SIS), which is used to move the information collected. It operates with Data Warehouse technology in order to provide statistical information related to the job market trends (Cesarini, Fugini, Maggiolini, Mezzanzanica & Nanini, 2006).

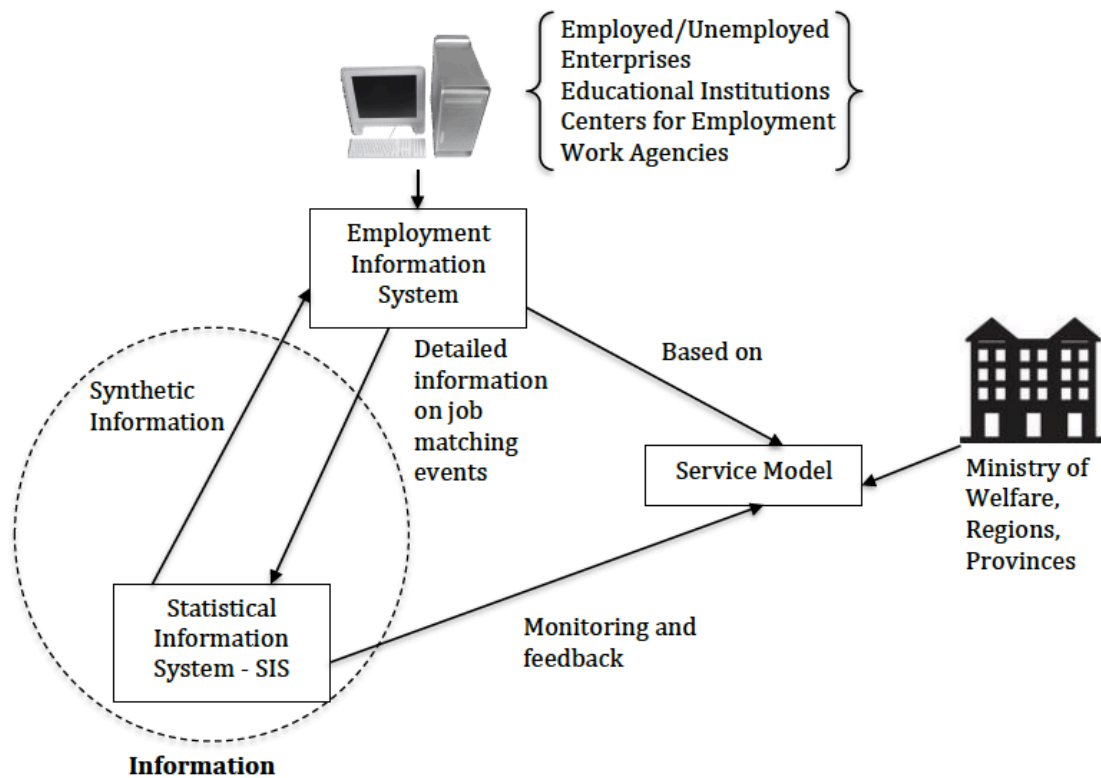


Figure 4. Reference Scenario (Cesarini, Fugini, Maggiolini, Mezzanzanica & Nanini, 2006).

2.3.1.1 End-Users

Citizens: The system contains all the profiles that are created by the citizens. Each profile can be accessed through an authentication (User and Password), which must be entered every time that the citizen starts session. The citizens can create the CV, apply for a specific position and/or choose an educational program. The data is stored and managed by the EIS databases.

Companies: First, the companies also must follow the registration process, in order to enable the creation and management of job requests. Additionally, the companies can choose a candidate, and the system will contact the candidate and will propose the job to him. Usually, when the candidate has been hired, the company has to notify it to the system, in order to guarantee a feedback about it and the R/O Job could be deleted. The centers of employment and private work agencies offer similar services as companies through the system.

Educational Institutions: These institutions must also be registered in the system in order to provide the services. The aim of these users is improving the professional skills of the job seekers in order to increase their access to a job. For that reason, they promote educational programs through the EIS, such as training, stages, courses and so on. These programs will help the candidates in the development of professional competences (knowledge and skills) to suit the needs of the labor market.

2.3.1.2 Network Structure

The Service Model is centered in one of the main characteristics of an Employment Information Systems that is the promotion of the job mobility in the territory. These is distributed in three domains (Cesarini, Fugini, Maggiolini, Mezzanzanica & Nanini, 2006):

- The National domain of the network, managed by the Ministry of Welfare
- The Regional domain composed of Regional nodes mutually linked through the National domain.
- The Provincial level: job portals at local sites on the territory are connected to the regional level and mutually exchange data through access to the Region.

In the next figure, it is showed the network structure of an Employment Information System based on an Italian context:

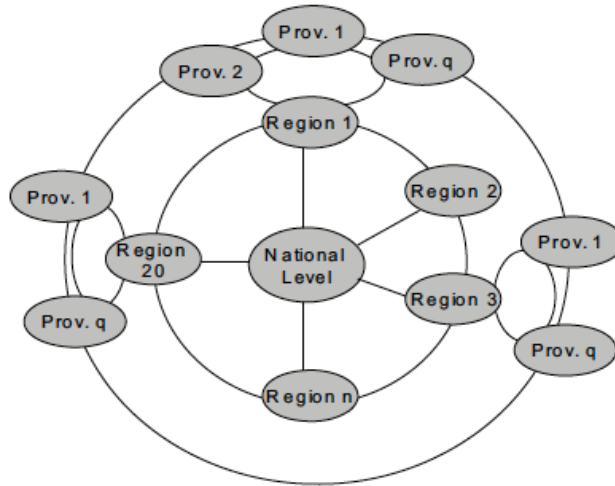


Figure 5. Network Structure EIS (Cesarini, Fugini, Maggiolini, Mezzanzanica & Nanini, 2006).

2.3.1.3 Statistical Information System – SIS

The SIS is an informative system oriented towards the collection, storage, transformation and distribution of statistical information. (<http://stats.oecd.org/glossary>). The administrative archives are the sources for SIS, because they contain the information of whole population with details such as government registries and tax registries. The importance of these systems is that it provides support in the process of decision-making, facilitates an analysis from different viewpoints, provides updated information in real time, allows understanding the behavior of people and companies based in information of past years and is used to return information to systems such as in this case Employment Information systems.

There are some phases involved in the design of a SIS, which can be repeated several times (Fugini, Mario, & Mezzanzanica, 2007):

- **Analysis of Administrative Sources:** In order to build a SIS, the first step is a detailed study of the source archives.
- **Data Cleansing:** There are some errors that can be presented in single sources such as, duplication, inconsistencies and unsuitability. Thus, each single archive has to be inspected for internal errors.
- **Data Integration:** Taking into account that all data coming from different archives, each archive manages special standards and structures. Therefore, it is necessary to create a global schema in order to incorporate the data in integrated archives.
- **Data Quality Improvement:** During the data integration, low quality may arise because there are some errors that are visible just in the global

schema level such as syntactical inconsistencies due to different abbreviations for the same data item.

Since the final result of a SIS is a huge archive of data, it is necessary to construct a Data Warehouse in order to store information for further analysis and execution of queries aimed at computing synthetic information. A SIS is based on a multidimensional model, where the data of the SIS are organized along *facts* and *dimensions* (Mariani, Mezzanzanica, & Zavanella, 2006). A schema of Data warehouse that can be useful for an Employment Information System is shown in the figure.

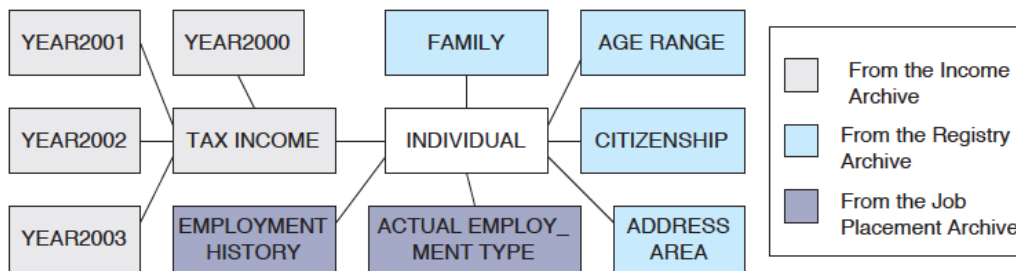


Figure 6. The Data Warehouse Schema (Mariani, Mezzanzanica, & Zavanella, 2006).

One example of a SIS is the America Project. AMeRiCa ("Anagrafe Milanese e Redditi Individuali con Archivio") is managed by the Statistics Department of Milan-Bicocca University on the behalf of Milan Municipality. It was launched with the purpose of deriving statistics about actual incomes of subjects and families of Milan, Italy. The administrative sources that are used come from the Registry Offices of the Municipality of Milan and from the Income Office (Cesarini, Fugini, Maggiolini, Mezzanzanica & Nanini, 2006).

2.3.2 Architecture

Taking into account different projects in the area of services to employment developed in Europe, such as Single European Employment Market - SEEMP, Borsa Continua Nazionale di Lavoro - BCNL and Borsa di Lavoro di Lombardia - BLL (PaperCripro2006, BLL Chapter 5) (Cesarini, Fugini, Maggiolini, Mezzanzanica & Nanini, 2006), the architecture of a general Employment Information System is composed by three components Front-end, Back-end and an integration system, using a service-oriented paradigm. In general terms, the front-end is in charge of receiving information from the end-user and process it considering the specification of the back-end. The functions of each component are:

2.3.2.1 Management Subsystem

In an EIS, the management system is the Front-end of the architecture. It includes the services related to search, data management, presentation and system management where the functions of the end-user such as Registration, Subscribing, Logging, Access and Notification are made. This is a visible interface for Citizens, Companies and Educational Institutions in order to provide access to the EIS Services, upload and update the information.

2.3.2.2 Integration Subsystem

The integration subsystem is in charge to guarantee the access and the integration with the operational subsystem. It contains the information related to procedures, job matching, laws, the workflow management, data organization and security and networks.

2.3.2.3 Operational Subsystem

The operational subsystem is the back-end of the architecture. It involves the functions related to the connectivity and exchange of the information with the domains of the network (National, Regional, Provincial). This subsystem allows end-users to connect from any domain because it includes the Application Services where is managed the communication between network nodes taking into consideration the cooperation between nodes, analogous systems, and access to databases. Additionally, this subsystem is in charge of managing the integration with the Statistical Information System and their data warehouses. This aspect is through of ETL, Data mining engine and the analysis and statistical production.

2.3.3 Examples of Projects

This section describes projects developed in different levels: SEEMP in a European level and BLL in a Regional level.

2.3.3.1 Single European Employment Market-Place (SEEMP)

SEEMP is a European project that started on 2006. The goal of SEEMP project is *to design and implement in a prototypal way an interoperability architecture for public e-Employment services which encompasses cross-governmental business and decisional processes, interoperability and reconciliation of local professional profiles and taxonomies, semantically enabled web services for distributed knowledge access and sharing* (Cesarini, Fugini, Maggiolini, Mezzanzanica & Nanini, 2006). The project was developed with the aim to coordinate and integrate public and private employment services (ES) through of a unique platform in EU Member states. This Project is based on the same network structure of nodes, but additionally, apart from the provincial, regional and national domains, there is a new level, the European domain. With this project, the number opportunities related with job vacancies, training and educational program increase.

The SEEMP project is based on European Interoperability Framework (EIF). This framework allows that the actual national/local job marketplace can interoperate at a pan-European level. This integration of heterogeneous systems existing in EU countries and regions solve core issues like (Celino, et. al. , 2007):

- Language heterogeneity
- CV and Job Offers structural heterogeneity
- CV and Job Offers content description heterogeneity
- System heterogeneity in terms of service interface and behavior

EIF recommends different solutions to the previous issues that can be implemented for each E-Government services, such as the use of open standards, multilingualism and multilateral solutions.

The technical solution in SEEMP is composed by (See Figure 4):

- The Reference Level: It includes the Employment Marketplace Platform (EMP) and the services provided by Employment Marketplace Mediators (EMM). This level includes the core component of the systems that is the Reference Ontology. This facilitates the communication between all the ESs involved in SEEMP through a common agreement. This specification is based on international standards, such as NACE, ISCO-88 (COM), FOET, etc., and international codes, such as ISO 3166, ISO 6392, etc. (Celino, et. al., 2007). In general terms, it acts as a common language in order to describe the details of Job Offers and CV taking into consideration that each ES has its own local ontology.
- The Connector Level: It is in charge to communicate each an employment system with the EMP. It will exist for each ES that is participating and has two main responsibilities (Della Valle et. al. , 2007): 1) *Lifting and Lowering*, the communications with ES that are made through Web services, must be lifted or lowered (depending the case) from XML to WSM and vice versa based on the local ontology of the ES. 2) *Resolving Heterogeneity*: It has to convert the local ontology of each ES in terms of the reference ontology in order to be shared with all the participants.
- The ES Level: They are all the ES participants of the marketplace that are part from EU member states.

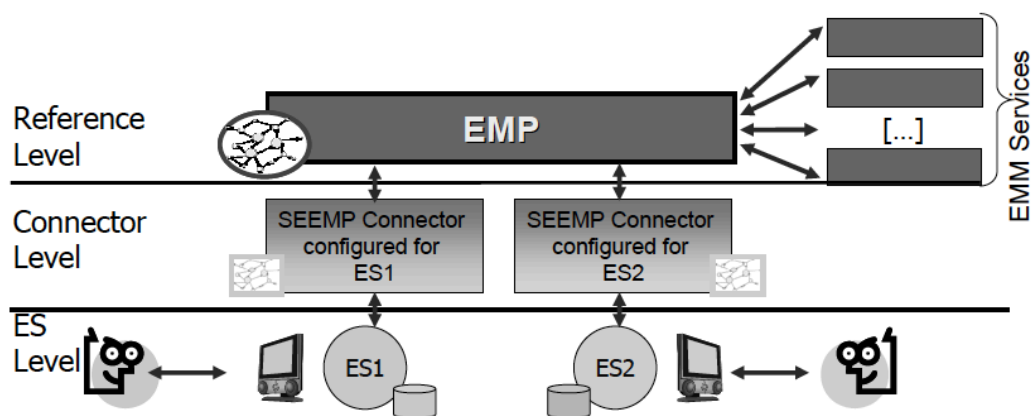


Figure 7. SEEMP Technical Solution (Celino, et. al. , 2007)

2.3.3.2 Borsa Lavoro Lombardia (BLL)

BLL (<http://www.borsalavorolombardia.net/>) is a system that offers a labor exchange, available to citizens, employers and public and private operators in Lombardia, Italia in order to match offers and request of jobs. The services

available are insert the CV, post jobs and facilitate contacts between those offers and job seekers. It is an open and transparent system available both to citizens and businesses and public and private operators, in which they can meet and communicate. To use the services, the users have to be registered. Taking into account the network structure mentioned previously (Figure 2), the BLL system is one node of the national system. At the national level, there is a system developed called Borsa Continua Nazionale del Lavoro (BCNL), and BLL system is part of Lombardia Region. Although, BLL is mainly oriented to the end-users in Lombardia, it can be also accessible to everyone in other regions without discrimination.

There two types of services offered by BLL (Buonanno, & Gaj, 2005):

- Information Services: These are the services that are available without any prior registration. The purpose of these services is to provide information that are useful, but not exhaustive, for instance, search for information of available jobs, certain professions, or the most popular professions.
- Operational services: These are the services that must be registered before. These are the usual services that are depending on citizens and companies. For the last one, there is an agreement of ethical code that has to be signed.

Based in this distinction, the actors are classified as Participants and non-participants.

The architecture of BLL is based on distributed systems and service oriented paradigm, using technology of web services. As was explained before, the architecture includes a front-end and back-end. The first one is in charge to provide the access to the BLL services. For citizens, the information of job offers, for companies allowing posting offers and private and public entities that can offer educational programs. The back-end has to connect the portal with the information systems and databases.

2.4 MODELS FOR ASSESSMENT OF EGOVERNMENT PROJECTS

In order to identify the strengths, weaknesses and the new trends in the development of E-Government projects, have been implemented techniques, models and surveys to measure the success of E-Government projects. In this section, the different models used to compare and rank E-Government projects are explained and the different methodologies and models created with the aim to evaluate a specific project are described

2.4.1 Benchmarking Models of E-Government Projects

There are several models that are used to compare and measure the progress of E-Government projects. Usually, these evaluations are carried out by surveys.

2.4.1.1 The European Commission

The European commission offered the E-Government Awards¹ that gave recognition to innovative initiatives in E-Government projects. The objective was to identify the good practices in the development of E-Government, and stimulate the innovation and share learning promoting the good practices. Additionally, the awards want to highlight the benefits of ICT to society, including: Improved quality of life of citizens, Increased public trust in government and Increased competitiveness of European enterprises. The categories used in the last edition of the E-Government Awards 2009 were: E-Government supporting the single market, E-Government empowering citizens, E-Government empowering business and E-Government enabling administrative efficiency and effectiveness.

2.4.1.2 The United Nations

In general terms the Global E-Government development Reports and Survey present a systemic assessment of how governments use Information and Communications Technology (ICT) to provide access and inclusion for all². The last edition of this report was the United Nations E-Government Survey 2012 (UNPAN, 2012) where the methodology used to measure was based on the following dimensions of E-Government: scope and quality of online services, development status of telecommunication infrastructure, and inherent human capital. The measurements used to evaluate each dimension are:

- Online services: They are evaluated based on four stages: Emerging information services, Enhanced information services, Transactional services and Connected services.
- The Infrastructure index: It is centered on five indicators: estimated internet users per 100 inhabitants, number of main fixed telephone lines per 100 inhabitants, number of mobile subscribers per 100 inhabitants, number of fixed internet subscriptions per 100 inhabitants, and number of fixed broadband facilities per 100 inhabitants.
- Human Capital Index: It is based on two indicators: adult literacy rate and the combined primary, secondary, and tertiary gross enrolment ratio, with two thirds weights assigned to adult literacy rate and one third weight assigned to the gross enrolment ratio.

2.4.1.3 Accenture E-Government Report

The report E-Government Leadership has as an aim reveals the current trends in E-Government and the most innovative E-Government practices of the world-leading governments. In the research E-Government Leadership: Engaging the Customer 2003 (Accenture, 2003) was founded that E-Government development matures and progresses through a series of stages of successive plateaus. From the basic to the most effective stage was defined: Online Presence, Basic Capability,

¹ <http://www.epractice.eu/awards>.

² http://unpan3.un.org/egovkb/global_reports/index.htm.

Service Availability, Mature Delivery and finally Service Transformation. The characteristics of each stage are (Accenture, 2003):

- **Online Presence:** In this stage the information is published online, there are few services available, and are provided by agencies that use an early infrastructural investment.
- **Basic Capability:** It is characterized because there are a central plan and a legislative framework. The infrastructural developments are based on security and certification. There is a broad online presence, the quick-win transaction capabilities are implemented and the agencies learn from the lessons of the early adopters.
- **Service Availability:** It includes basic portals that are characterized for driving to make as many services as possible available as quickly as possible. The broad targets are in place, it is implemented some sophisticated transaction capabilities; there is cooperation between agencies and customer start being the focus.
- **Mature Delivery:** In this stage, the transactional portals are Intentions-based, there are services clusters and a new approach based on "do more with less". There is clear information about ownership and authority and the relationship between agencies is improved and also there is collaboration among different levels of government. This stage is focus on customer services objectives.
- **Service Transformation:** The vision in this stage is the improvement of the customer service delivery, E-Government is no longer a separate initiative but part of wider service transformation. There is multichannel integration and the relationship between agencies includes organization, process and technology changes.

2.4.2 E-Government Evaluation Models

In this section is presented some of different perspectives and methods of assessment government, such as:

2.4.2.1 Wang and Liao

Wang and Liao (Wang & Liao, 2008) propose a multidimensional model where is defined how measure the success of Government-to-Citizens information systems. This proposal is based on the evaluation model of DeLone and McLean, and it suggests that the information quality, system quality, service quality, use, user satisfaction, and perceived net benefit are success variables that can be measures in E-Government systems (Wang & Liao, 2008).

Figure 5 shows the relationship between this variables and the hypothesis that were tested. Except for the link from system quality to use, the hypothesis relationships between the six success variables were significantly or marginally supported by the data that they used.

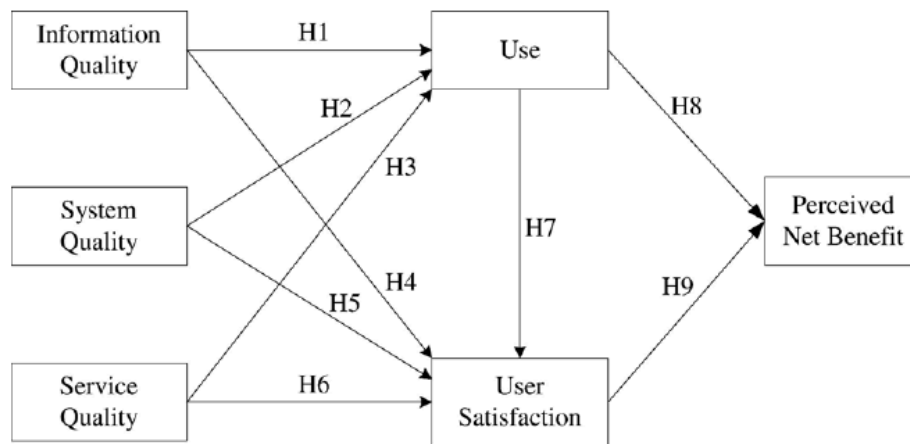


Figure 8. Research model (Wang & Liao, 2008).

The hypothesis tested were (Wang & Liao, 2008):

- H1. Information quality will positively affect use in the G2C E-Government context.
- H2. System quality will positively affect use in the G2C E-Government context.
- H3. Service quality will positively affect use in the G2C E-Government context.
- H4. Information quality will positively affect user satisfaction in the G2C E-Government context.
- H5. System quality will positively affect user satisfaction in the G2C E-Government context.
- H6. Service quality will positively affect user satisfaction in the G2C E-Government context.
- H7. Use will positively affect user satisfaction in the G2C E-Government context.
- H8. Use will positively affect perceived net benefit in the G2C E-Government context.
- H9. User satisfaction will positively affect perceived net benefit in the G2C E-Government context.

2.4.2.2 *Esteves and Joseph*

Jose Esteves and Rhoda C. Joseph (Esteves & Joseph, 2008) proposed a model that consists in three components: E-Government maturity level, E-Government Stakeholders and assessment dimensions (See Figure 6). The model is based on the social-technical model of Bostrom and Heinen, which incorporate four social and independent elements: actors, structure, technology and task. Additionally, the dimensions established in this model are based on the STOPE Model of Bakry (2004), taking into account that the strategy, technology, organizations, people and environment are seen as the core components for the development of E-Government.

The components of the framework are (Esteves & Joseph, 2006):

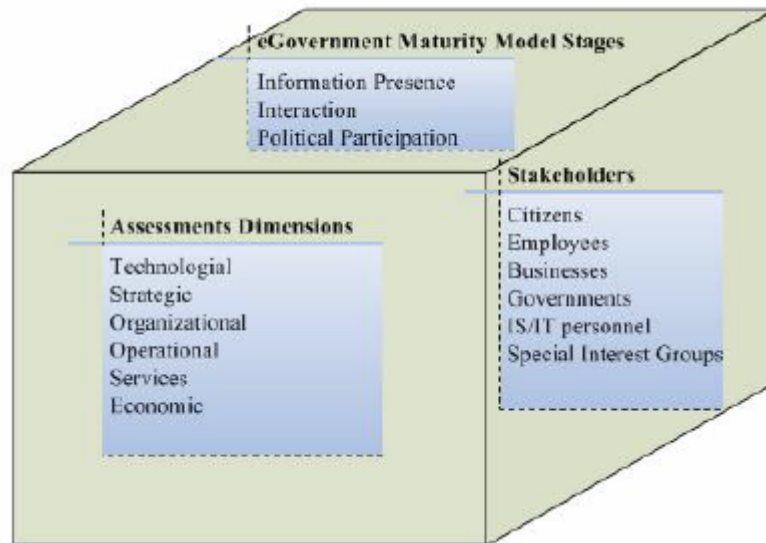


Figure 9. A framework for E-Government. Initiatives assessment (Esteves & Joseph, 2006).

- **E-Government Stages:** The identification of the maturity level of E-Government projects allows understanding the elements and overall objectives in order to gain control of the process for developing and maintaining the E-Government services. There are different models that have been proposed to define E-Government maturity stages, which are called eGMM - E-Government Maturity Model. As a synthesis, the maturity models involves the following three phases: information presence – the government has an available website; interaction – two-way interaction with government and stakeholders and political participation – voting and activism.
- **Stakeholders:** In order to identify the primary stakeholders, they categorized the scope of E-Government based on the definition of Heeks (2001): E-Administrations, E-Citizens and E-Services, and E-Society. In general the stakeholders defined are: Citizens, Businesses, Governments, IS/IT Personnel and Special Interest Groups.
- **Assessment Dimensions:** The model is based on the work of Bakry (2004) where six dimensions are defined: 1) Strategic, related with core competencies accomplishing the organization’s mission and long-term goals, 2) Technological, focuses on aspects related E-Government IT and on other related technical aspects, such as hardware and base software needs, 3) Organizational, related with concerns like organizational structure and culture, 4) Economic, focus on the economic aspects related with E-Government initiatives both investments and benefits obtained, 5) Operational, involves processing of various products arriving from external suppliers or other government agencies and 6) Services, focus on information services, interactive services and integrated services.

This model is applicable for local, regional or national level analysis and can be used as a template for such evaluation before, during and after the completion of the projects. Additionally, the model is not based on specific measurement indices.

2.4.2.3 Liu, Derzsi, Raus and Kipp

Liu et. al. (Liu, Derzsi, Raus & Kipp, 2008) presented an integrated value assessment framework, where it is introduced a “top-down” approach based in three different levels of analysis:

- Value Categories: In order to understand the core value categories for public sector organizations, they selected the four common typologies for value assessment: Financial Value, Social value, Operational (Foundational) value and Strategic (Political) value.
- Key Performance Areas: Once the value categories are defined, it has to be identified the key performance area (KPA) per value category to refine the value assessment. The KPA are areas for project success factors that include better organizational performance.
- Key Performance Indicators (KPI): After the KPA are identified, each of these must be measured by one or more KPI. The KPI are quantitative or qualitative measurements used to reflect the performance of an organization.

This model is based on Government-to-Business (G2B) context, and how was explained all the dimensions need indices in order to be measured.

2.4.2.4 Batini, Viscusi and Cherubini

Batini, Viscusi and Cherubini (Batini, Viscusi & Cherubini, 2009) proposed a methodology for E-Government project selection that is called GovQual. This methodology is based on a multidisciplinary approach, which considers social and technological issues as a focus, in order to identify and rank the E-Government projects. Additionally, the model uses a quality-driven strategy, where its aim is to identify and measure the most relevant qualities of the different organizational/technological issues, and is used in order to assess the actual and future target quality values for services, process, organizational systems and technologies. The qualities considered the methodology are divided in four categories: Efficiency, Effectiveness, Accessibility and Accountability. These categories can be seen as dimensions of the model.

In general terms, this model is a multi-layered framework that measures project quality with respect to an organization’s environment (social context) and specific targets for service quality (Fitsilis, Anthopoulos and Gerogiannis, 2009). Its objective is to provide guidelines for the choice of projects and can be applied at several levels: single administration, set of administrations, single process or services, and set of process or service.

2.4.2.5 Luna, Gil and Romero

Luna, Gil and Romero (Luna, Gil & Romero, 2012) proposed a multidimensional model for measuring electronic government based in 21 variables (see Table 1) that are grouped in three dimensions:

- Determinants of electronic government
- Characteristics of electronic government
- Results of electronic government

Determinants	Characteristics	Results
Quality of the information and existing data to feed the systems	Quality of information available on web sites and in systems	Statistics on systems usage
Technological infrastructure and compatibility	Interaction	Quality of public services
Organizational and management characteristics	Personalization	Efficiency and productivity
Existing legal and institutional framework	Security	Effectiveness of programs and policies
Potential demand	Privacy	Transparency and accountability
	Accessibility	Citizen participation
	Usability and usefulness	Changes in the regulatory framework

Table 6. Map of the measurement framework with E-Government characteristics, determinants and results (Luna, Gil & Romero, 2012).

This model can be used in different context, such as a tool for describing the situation of a country, as a comparison tool or as a tool for finding specific problems. For that reason, this model is characterized not only to provide information about the E-Government, but also to provide a guidance to decision makers to develop and test different strategies and policies.

3 DEVELOPMENT OF THE EVALUATION MODEL

3.1 MODEL INTRODUCTION

So far, a deep research about existing E-Government evaluation frameworks and models has been developed. All of them provide different ways to evaluate E-Government systems, which would help to fulfill effectively the main objective of the present study. Therefore, the aim of this chapter is to present and describe an evaluation model that combine the proposals of different authors analyzed in the literature review based on employment information systems.

The model is focused on Employment Information Systems (EISs). The main components of EISs are analyzed in detail in what follows.

- **Stakeholders** include Citizens, Employees, Job Seekers, Companies, Educational Institutions, Competitors, Public Administration and Private Employment Agencies.
- The **EIS** that can be at local, regional or national/international level. All of them are included within an Environment.
- The **Environment** is related to the context in which the EIS operates. The aim of having the Environment component in our model is to recognize the circumstances that occur around the EIS, and also to analyze the different variables and indicators (e.g. of the Country, or political factors or laws) of the context in which it is developed, in order to reach a comprehensive understanding of the whole system and the factors affecting its development and its operation.

The methodology that has been followed in order to present the evaluation model is based on three main different analyses: Environment, Stakeholders and EIS. In the next sections, it will be presented a specific description of each perspective of analysis, entering into the detail of the components, factors and dimensions that constitute each of them.

3.2 MODEL DESCRIPTION

The proposed evaluation model uses three analytical phases: Analysis of Environment, Analysis of Stakeholder and Analysis of System (Figure 10), being our main contribution the inclusion of the analysis of the Environment and its components, using indicators already defined in the literature. These indicators are adapted to our case.

The first phase is the Analysis of the Environment, then the Analysis and Identification of Stakeholders, and ends with the Analysis of the EIS. Together, it conforms the path of the qualitative assessment of an information system. The main idea behind this logical process is precisely to support the exploration of

information related to a specific EIS, such as the SOC in Catalonia - Spain and/or the BLL in Lombardia - Italy. The idea is to select the set of indicators, which are useful and meaningful for the case of the labor market from the plethora of indicators existing in the literature.

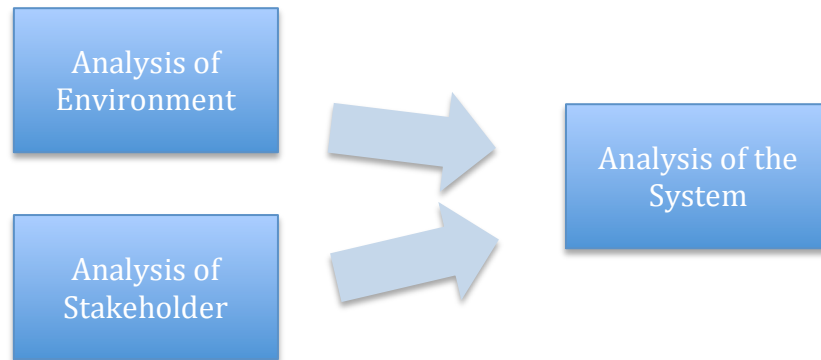


Figure 10. Process of the Evaluation Model

In order to analyze each analysis phase, it is needed to determine the time period over which the stakeholders, the environment and the system are observed. This will allow creating a picture of the real context where the system is developed.

3.3 ANALYSIS OF ENVIRONMENT

Based on the premise of Johnson and Scholes (1993) that: *In analyzing the macro-environment of an organization, it is important to identify the factors that might in turn affect a number of vital variables that are likely to influence the organization's supply and demand levels and its costs* (Koumparoulis, 2013). The analysis of Environment in this model will allow analyzing the context in which the EIS operates. This analysis is mainly focuses of an *external analysis* taking into account that it is considered the country, the region, the laws and so on where the system is developed and operated. We propose to use the *Telecommunication Infrastructure Index* established by the United Nations and a PEST Analysis.

3.3.1 The Telecommunication Infrastructure Index

It is an arithmetic average composed of five indicators: estimated internet users per 100 inhabitants, number of main fixed telephone lines per 100 inhabitants, number of mobile subscribers per 100 inhabitants, number of fixed internet subscriptions per 100 inhabitants, and number of fixed broadband facilities per 100 inhabitants (UNPAN, 2012) (Figure 11). This index will allow assessing the access level to information technologies.

$$\begin{aligned}
 & \text{Telecommunication infrastructure composite value} = \\
 & \text{Average (} \\
 & \quad \text{Internet user Z-score} \\
 & \quad + \text{ telephone line Z-score} \\
 & \quad + \text{ mobile subscription Z-score} \\
 & \quad + \text{ fixed internet subscription Z-score} \\
 & \left. \right)
 \end{aligned}$$

Figure 11. Formula: Telecommunication Infrastructure Index. (UNPAN, 2012)

3.3.2 PEST Analysis

The PEST analysis is a framework used in the assessment of the external environment in which a company operates or intends to operate, it thus provides a satellite view (Ward, 2005). PEST will allow analyzing the development of an EIS in a specific country and/or region in order to develop an understanding on the context and generate meaningful indicators, factors, and trends. The four dimensions contemplated in the PEST model are: Political, Economic, Social and Technological.

- Political: In this part, it is analyzed the intervention of the government. They are the factors that the government uses to influence in the economy.
- Economic: This part includes the factors that have impact in the general business operation.
- Social: This part is related to the cultural factors and how them can affect the operation of a system.
- Technological: This dimension includes the technological changes related to Research and Development, innovation and investment in infrastructure.

The factors that should be taken into account in each dimension are summarized in the Table 7:

Political (incl. Legal)	Economic	Social	Technological
Environmental regulations and protection	Economic growth	Income distribution	Government research spending
Tax policies	Interest rates & monetary policies	Demographics, Population growth rates, Age distribution	Industry focus on technological effort
International trade regulations and restrictions	Government spending	Labor / social mobility	New inventions and development
Contract enforcement law Consumer protection	Unemployment policy	Lifestyle changes	Rate of technology transfer
Employment laws	Taxation	Work/career and leisure attitudes	Life cycle and speed of technological obsolescence

		Entrepreneurial spirit	
Government organization / attitude	Exchange rates	Education	Energy use and costs
Competition regulation	Inflation rates	Fashion, hypes	(Changes in) Information Technology
Political Stability	Stage of the business cycle	Health consciousness & welfare, feelings on safety	(Changes in) Internet
Safety regulations	Consumer confidence	Living conditions	(Changes in) Mobile Technology

Table 7. Drivers of the PEST model dimensions. (Ward, 2005)

3.4 ANALYSIS OF STAKEHOLDERS

A stakeholder represents any entity (individual, group or firm) that can affect or is affected by the organization's execution of its objectives (Porter 1985). The analysis of stakeholders will permit understanding the ways in which the different actors can influence into the EIS. The major participants as the primary stakeholders in the EIS domain are (Figure 12): citizens, employees, job seekers, companies, educational institutes, competitors, public administrations and private job agencies. Each stakeholder represents a unit of analysis for the evaluation model. In this section, it will be explained how to analyze the different stakeholders.

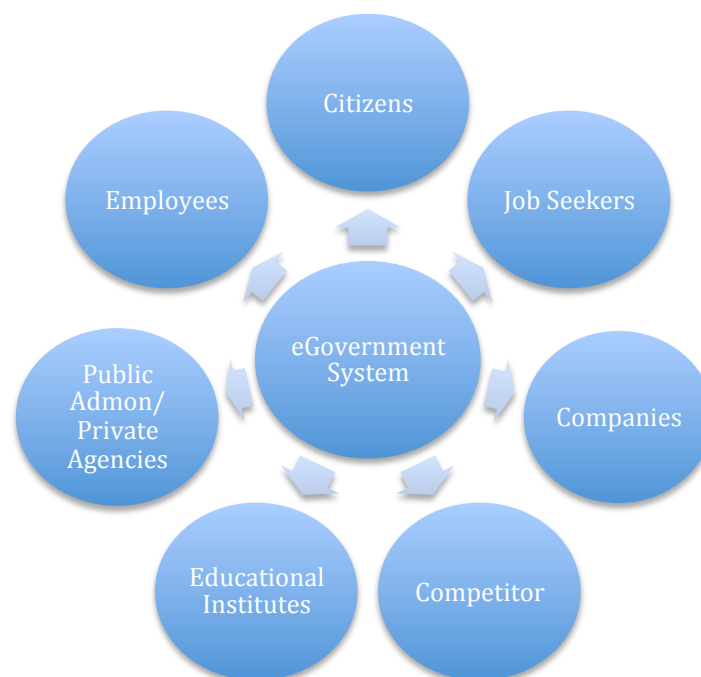


Figure 12. Stakeholders of the Evaluation Model

3.4.1 Citizens

Citizens in contact with the public administration, using public and private services and also exercising their civil rights, participating in democratic process (Esteves & Joseph, 2008). The analysis of citizens will be done using one of the dimensions proposed by The United Nations, which is Inherent Human Capital. The importance to measure the Human Capital derives from the need to establish whether there is positive link between low human capital and EIS Development. With a higher level of education and skill, the general population is likely to have larger access to ICTs and is likely to embrace modern ICTs quickly and more efficiently.³

As mentioned previously, the Human Capital Index is based on two indicators: adult literacy rate and the combined primary, secondary, and tertiary gross enrolment ratio, with two thirds weights assigned to adult literacy rate and one third weight assigned to the gross enrolment ratio. (Figure 13)

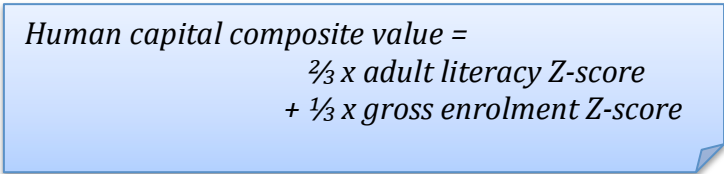

$$\begin{aligned} \text{Human capital composite value} = & \\ & \frac{2}{3} \times \text{adult literacy Z-score} \\ & + \frac{1}{3} \times \text{gross enrolment Z-score} \end{aligned}$$

Figure 13. Formula: Human Capital Index. (UNPAN, 2012)

3.4.2 Employees and Job Seekers

Include all categories of public employees and citizens that are looking for a job. To evaluate this dimension, it is proposed to use statistics based on a determined period, related to:

- Number of employed people.
- Number of unemployed people.
- Number of graduated people with different levels of education.

3.4.3 Companies and Educational Institutes

They are the companies and institutions that provide R/O job or training for employment. They must be registered and/or accredited by the EIS in the specialties they want to impart. In order to analysis these stakeholders, the model considers to identify different statistics based on a defined period:

³ http://unpan3.un.org/egovkb/egovernment_overview/humancapital.htm

- Number of companies that requested and/or offered jobs.
- Number of different fields of work.
- Number of universities and institutes that offered training courses.

3.4.4 Competitors

Some systems can have different targets and scopes but if they are in the same area of services of employment and are based on job seeking, then they are considered as competitors. The analysis of competitors includes the identification of them in the period defined, and their identification of strengths and weaknesses. This analysis provides a context that enables determine which opportunities the competitors use in order to take advantage.

3.4.5 Public Administration

The public administration is in charge to provide the public services to citizens, granting common interest such as health, education, safety, and so on. (Fugini. M, Maggiolini. P, Vallès,. R, 2013). In this case, the role of the Public Administration in the area of EISs is carried out through the Public Employment Agencies. The analysis of these groups of stakeholder is based on:

- Number of public employment offices that are allowed to offer the services of job and economic promotion.
- Number of channels used to provide the services in the public employment offices.

3.4.6 Private Job Agencies

For private employment agencies, we assume to consider the same indicators and measures as done for public services.

3.5 ANALYSIS OF EMPLOYMENT INFORMATION SYSTEM

This analysis evaluates the level of maturity and value creation of the observed system. The aim is to establish how developed is the system and their users, assessing different dimensions that surround the whole construction, integration and usability.

The dimensions proposed to develop this analysis are:

- Strategic
- Economic and Financial
- Organizational and Technological
- Services Provision
- Social Outcomes

- Political and Democratic

These dimensions were selected from the different papers and works reviewed, using the factors established by authors like Wang & Liao (2008), Esteves & Joseph (2008), Liu, Derzsi, Raus & Kipp (2008), Luna, Gil & Romero (2012) and Batini, Viscusi & Cherubini (2009). Table 8 shows a summary of the factors and values proposed by each author.

Authors	Factors
Wang & Liao (2008)	<ul style="list-style-type: none"> • Information quality • System quality • Service quality • Use • User satisfaction • Perceived net benefit
Esteves & Joseph (2008)	<ul style="list-style-type: none"> • Strategic • Technological • Organizational • Economic • Operational • Services
Liu, Derzsi, Raus & Kipp (2008)	<ul style="list-style-type: none"> • Financial • Social • Operational • Strategic (Political)
Luna, Gil & Romero (2012)	<ul style="list-style-type: none"> • Determinants of electronic government • Characteristics of electronic government • Results of electronic government
Batini, Viscusi & Cherubini (2009)	<ul style="list-style-type: none"> • Efficiency • Effectiveness • Accessibility • Accountability

Table 8. Summary of factors proposed by authors.

Based on these studies, most of the factors can be grouped in the six dimensions mentioned before. This collection gives a complete framework that will be useful to measure and evaluate different systems based on governmental institutions and the services offered by them.

3.5.1 Strategic Dimension

Strategy can be defined as an integrated and comprehensive method, based on the focus and direction of an organization, and which objective is to reach a long-term performance to achieve better results than its competitors.

In this specific case, strategy is related to the goals and future plans of the government and its institutions. This dimension analyses projected results against the actual results of the project, based on the strategic objectives, evaluating the

planning, control, decision-making and the risks associated to the developed system.

This dimension can be divided in three main components: Objectives, Risk Management and Future Development Plans.

- **Objectives:** this component is related to the mission and vision of the organization, evaluating:
 - Goals definition
 - Goals completion
 - Level of flexibility of the strategy
- **Risk Management:** this component evaluates the risk associated to the development and running of an EIS project. For its evaluation, is necessary to identify the internal and external risk affecting the strategy, measuring their Impact and Probability of occurrence.
- **Future Development Plans:** this component tries to measure the level of commitment and long-term vision of the entity, related to the system. Some measures to evaluate this section are:
 - Plans and Initiatives.
 - Resources.
 - Infrastructure growth.

3.5.2 Economic and Financial Dimension

This dimension is related to the monetary resources and costs associated to the system. The aim with this factor is to establish the investments and returns, and the value creation of the project.

Also, is useful to evaluate cost reduction related to the reduction of transactions and bureaucratic procedures, and the benefits obtained for the automated processes.

For this dimension, it is possible to define many indicators to obtain a value of the creation and consumption of resources. However, the most useful measures here are:

- ROI
- EBITDA
- Cost vs. Benefit (Total Business Return Indicator)
- Financial Flows
- Cost of Traditional Procedure vs. Cost of Online Procedure

3.5.3 Organizational and Technological Dimension

In this part the analysis establishes the level of development of the system with respect to the technological resources used, and also the organizational structure

of the organization for which the EIS is being developed. This dimension brings together organization and technology, because an important component for EISs is the level of integration and accessibility of resources and information.

The organizational field evaluates the structure of the institution, taking into account the activities and processes developed, their periodicity and the information flow related to each one.

For the technological part, the analysis evaluates the hardware and software used to develop the system, its capacity, level of usefulness and accessibility and the human capital that interacts in the project, from its development until its operation.

The measures proposed here to assess this dimension are:

- Number of processes and procedures.
- Number of processes automated.
- Online Services available
- Hardware model and capacity
- Software technology, updates and patches
- Databases technology and capacity
- Number of entities interconnected (i.e. using the same hardware, software and databases).
- Certification and experience level of developers, managers and assistant personnel.
- Level of knowledge of users
- Accessibility and usability for citizens and for users in general.

3.5.4 Services Provision Dimension

This dimension is related to the services offered to the citizens by the system, evaluating the quality and level of satisfaction of the users, and the easiness to access and follow the new procedures.

The aim with this module is to find if the system is capable to fulfill the requirements of its users and what procedures and tools should be improved to increase the level of quality of the services provided.

For the evaluation of this dimension, is possible to use measures as:

- Level of satisfaction
- Response times (Traditional vs. Online)
- Usability
- Accessibility and accuracy of the information
- Usefulness of the procedures and information
- Quality of information, system and services offered
- Efficiency and effectiveness of the services
- Level of security to access the system

3.5.5 Social Outcomes

This is an important issue that helps to evaluate the level of confidence, justice and security perceived by the users of the system, but not just related to the system itself, but also to the government and its institutions.

This dimension also takes into account the level of skills of the users, and the training and programs offered to help and teach how to use the services and tools developed.

In order to measure this module it is possible to use:

- Annual reports published
- Level of security and justice of the country
- Skills required
- Training programs
- Accessibility and availability of the system in the whole territory
- Benefits for handicap people

3.5.6 Political and Democratic Dimension

This dimension is correlated with the Social Outcomes dimension, in the sense of how citizens perceive the government activities. In this module the analysis evaluates the level of openness of the government and its institutions, and the level of participation granted to the citizens.

Openness is viewed as how much information is public and how many processes and policies are accessible online, meanwhile participation is related of the capacity of the users to communicate and evaluates the performances of their institutions.

To evaluate this dimension, the measures are:

- Online processes and services
- Open and online documentation related to laws, financial books and governmental decisions
- Response times to queries, questions and complaints
- Traceability of online processes
- Level of interaction with users
- Forms for evaluate and rate sites and its services
- Online discussion forums
- Real time assistance online

Applying the dimensions proposed is possible to obtain a global perspective of the performance and transparency level provided by the system, acquired a lot of

information that can be useful in order to improve and change the processes, tools and procedures offered.

4 CASE STUDIES

The present chapter describes the application of the evaluation model proposed in Chapter 3 implementing the different phases in real EISs. The main objective of the model validation is to test the logical procedure defined: Analysis of Environment, Analysis of Stakeholders and Analysis of the System, in order to confirm whether the application of our proposed model supports the evaluation of an EIS.

The systems chosen as a case studies are SOC (Servei d'Ocupació de Catalunya) and BLL (Borsa Lavoro Lombardia. First, a description of the EISs will be presented, followed by a section showing the validation process of the model using the proposed phases of the model developed before.

4.1 CASE STUDY: SERVEI D'OCUPACIÓ DE CATALUNYA (SOC)

4.1.1 Description

SOC is an EIS devoted to employment services of the Department of Labor of the Government of Catalonia, which is responsible for managing job offers. It is a free public service that offers a labor intermediary function: contacting people who seek work with companies that need workers.

Additionally to the job placement programs, the service also offers career guidance and training.

The SOC main functions are:

- Provide services to all persons seeking employment, regardless of their employment status (active or unemployed).
- Provide a framework of equal employment opportunities for all.
- Promote entrepreneurship and support small and medium enterprises.
- Getting the dialogue and engagement between public and private actors to drive the employment policies.
- Achieving a high occupancy level through active action with promotion and job creation.

4.1.1.1 Objectives

The SOC program based its performance in the European Employment Strategy and in the national work plans of the State.

The document of the European Employment Strategy (European Commission, 2014) sets out five ambitious targets for occupation, innovation, education, social inclusion and climate / energy. This is to overcome the consequences of the economic crisis and put Europe back on the path of economic growth.

Thus, in the area of employment, the 2020 strategy's objective is to achieve 75% occupancy of people aged 20 to 64 years. For education, the aim is to reach a dropout rate below 10% and achieve that at least 40% of 30-34-year-olds completing third level education

Also, the objectives of Spain's National Employment Policy are align with the 2020 European Strategy, aiming to:

- An employment rate of 74% for the population aged 20 to 64 years
- A female employment rate for the same age group of 68.5%
- Reduce temporality and labor market segmentation.
- Strengthen work part-time and internal flexibility of companies.
- Improve skills and adapt to market needs.
- Promote rapid and successful reintegration of people in the labor market.
- Promote gender equality in the labor market.

4.1.1.2 Structure

The SOC is organized into the following departments (Figure 14):

- SOC Director
 - Occupational Network Director
 - Barcelona Territorial Director
 - Tarragona Territorial Director
 - Lleida Territorial Director
 - Girona Territorial Director
 - Central Catalonia Territorial Director
 - Programs Director
 - General Sub-director of Active Policies
 - Technical Secretariat
 - General Management

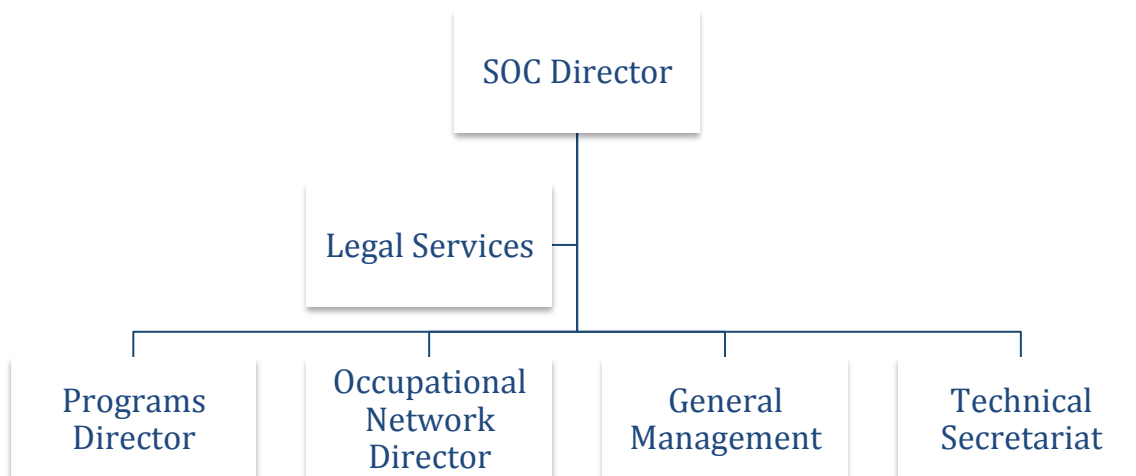


Figure 14. SOC Organizational Chart. Adapted from *Memorias de actividades del SOC*

The bodies of the SOC are the following, according with the *Memorias de actividades del SOC* (2011) are:

- **Governing bodies:** the director of the SOC and the Board of Directors, which is a participatory single-person body with decision-making, consulting and monitoring functions, and, together with the general management of the SOC, makes up the governing bodies of the SOC. The board members are representatives of the most representative labor and employer organizations in Catalonia, associations representing local authorities, and the Catalan Government administration.
- **Regional executive bodies:**
 - The Territorial Services are the institutional representation of the SOC in the region.
 - The employment offices of the Department of Labor of the Catalan Government are a point of reference in the territory.
 - The Centers of Innovation and Vocational Training (CIFO) are the SOC reference centers for vocational training.

4.1.1.3 Budget

The SOC is an autonomous body with legal personality, administrative autonomy, and full economic and financial capacity to act in the exercise of the functions entrusted to it and for the fulfillment of its purposes, as well as for management of its assets. In accordance with Article 24 of Law 17/2002 creation of the SOC, its financial resources consist of:

- The charges that are reflected in the budgets of the Government
- The returns of the assets assigned to it and that it acquires in the exercise of their functions
- Grants, contributions and donations given by persons or public/private entities
- Fees, rights and other equity benefits that apply
- Any other resources that the law allows

According with the last report published, for 2011, the final budget was EUR 697,511,638.92, representing an increase of 52.92% over the initial budget for the same period.

4.1.1.4 Services

- **Guidance Services**

The professional service orientation from SOC facilitates a greater understanding of the labor market and allows users to assess if they have all the market requirements, increasing the chances to get a job position.

- **Employment Network**

The employment network has 70 offices located throughout Catalonia, which are the gateway to services offered by the SOC, for both individuals and businesses. It should be noted that the offices focus their activities on the management of the supply and demand for labor and, as stated above, on the orientation, while offering more services, including the issuance of certificates and reports, and also offer diverse information, among other things.

- **Occupational Programs**

Active employment policies are primarily intended to improve the employability of participants and, consequently, also to improve their situation in the labor market.

One of the main objectives of the SOC is to improve the professional qualification of job seekers in order to increase their access to a position. Through occupational training, professional skills can be improved to suit the needs of the labor market.

- **Online tools**

- Website

The SOC website came into full operation in 2006. It is conceived as a *virtual office*, which means that beyond providing institutional information, people and companies can access, in part, to the majority of services offered by Traditional Employment Offices. Thus, people may wish to search for job offers or inquire about employment programs at their fingertips. Also, the website provides useful information for job search and on the rights and duties of workers.

Also, the website provides access to information related to procurement processes or contracts. In addition, it is especially useful access to Contrat@ application that allows communication contracts on the Internet, reducing by more than 70% the manual processing contracts. Finally, companies also have access to specific information on grants and subsidies for hiring people belonging to groups with special difficulties of insertion.

During 2011, 2,478,635 of transactions have been performed through the website of the SOC:

- 26,571 changes in legal status
- 41 requests of appointments for orientation
- 80,141 resume consults
- 1,654 registered job offers
- 50,132 certified reports
- 1,190,463 registrations and renewals
- 19,078 reports of requested services
- 59,281 reports of request status
- 23,500 reports of tendered jobs
- 2,984 PIN modifications
- 14,141 PIN reminders

- 984,729 offers renewed
 - 25,921 validation of certificates
- e-formaciò
- This is a tool that offers online courses in more than 50 different specialties, between 25 and 125 hours that are offered throughout the year. The areas of competition are:

- Computers and Internet.
- Languages.
- Job search techniques, career management and improvement communication.
- Logistics of procurement, operations and distribution.
- ICT and information management and communication.
- Tourism
- Professional competence in the company

Users can register through the website of the SOC and can take two courses per year.

The total budget for *e-formaciò* program was 1,030,000€ and benefiting 28,571 people.

- Connecta't
- Designed for unemployed workers, this service allows them to acquire basic digital skills that will improve their job search process. The project was developed in collaboration with the Province of Barcelona and several libraries managed by the network of municipal libraries in the province of Barcelona.

The program is structured in two modules of 10 hours each:

- Type A: office tools and Internet with the aim of spreading the use of office software and Internet to helping them in the job search process.
- Type B: application of office tools and Internet job search, in order to learn how to prepare a resume and cover letter.

The total budget for the Connect program in 2009 was 130,000 euros and the beneficiaries of this program have been 4424.

4.1.2 Analysis of Environment.

In this section, we present the analysis of Environment of SOC. Taking into account that SOC is a system used in Spain, the analysis of Environment will be based on this country.

- **Telecommunication Infrastructure Index**

The first indicator proposed in the model to analyze the environment is the Telecommunication Infrastructure Index. This indicator is based on the reports of United Nations about E-Government from 2005 to 2011. (UNPAN, 2005) (UNPAN, 2008) (UNPAN, 2010) (UNPAN, 2012).

This chart (Figure 15) illustrates the telecommunications Infrastructure Index of Spain from 2004 to 2012. The year with the largest index is 2012, with 0.6318 whereas 2004 and 2005 have the smallest indexes, 0.3933 and 0.3919, respectively. In 2008, Spain has improved tremendously since 2004, and can be seen a continuous improvement in the following years.

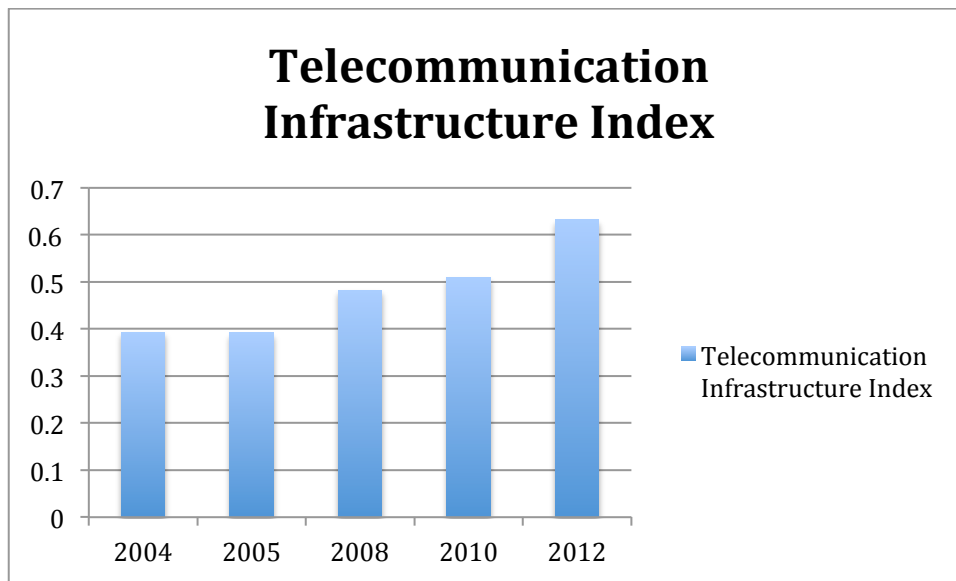


Figure 15. Telecommunication Infrastructure Index of Spain 2004-2012

Table 9 shows the five sub-indexes used to determine the total Telecommunication Infrastructure Index in 2008, 2010 and 2012. The main change that can be observed in the values is the increase in the number of PCs per 100 from 28 to 40 between 2008 and 2010. Additionally, it is important to highlight the rise in the number of Internet users per 100 from 43 to 67 between 2008 and 2012.

Year	Estimated Internet users per 100 inhabitants	Main fixed telephone lines per 100 inhabitants	Mobile subscribers per 100 inhabitants	Personal computers per 100 inhabitants	Fixed Internet subscriptions per 100 inhabitants	Total fixed broadband per 100 inhabitants	Index value
2008	42.83	42.38	106.39	28.11		15.34	0.482
2010	56.7	45.41	111.68	40.04		20.22	0.51
2012	66.53	43.2	111.75		21.89	22.96	0.6318

Table 9. Sub-indexes of Telecommunication Infrastructure Index of Spain in 2008, 2010 and 2012.

Table 10 shows the leading countries, plus Spain, showing the ranking of each country in relation with the Telecommunication Infrastructure Index. This index is evaluated from 0 to 1, with 1 being the best country for that index. In the table, we can see that although Spain increased its Telecommunication Infrastructure Index from 2008 to 2012, the place where Spain is located in the rankings is lower in each year. In 2008, Spain is located in 28 place, whereas in 2012 has the 35 position.

Year	Rank	Country	Index Value
2008	1	Netherlands	0.814
	2	Switzerland	0.79
	3	Sweden	0.7842
	29	Spain	0.482
2010	1	Switzerland	0.7687
	2	Netherlands	0.7666
	3	Sweden	0.7522
	30	Spain	0.51
2012	1	Liechtenstein	1
	2	Monaco	0.937
	3	Switzerland	0.8782
	35	Spain	0.6318

Table 10. Comparison of Leading Countries and Spain in the Telecommunication Infrastructure Index.

- **PEST Analysis**

As described before, the PEST analysis describes a framework of the external macro environment expressed in terms of political, economic, social and technological factors. In our case, we are going to analyze Spain in terms of the factors that we consider affect the development of SOC System.

First, we present a general Table 11 that includes data for Spain on economy, labor, technology, etc. And second, in each dimension we present the key findings that we consider as relevant for our study. The information of each dimension is based on reports presented for the European Commission, Eurostat, Directorate-General for Taxation and Customs Union, Datamonitor and International Labor Organizations.

Data	2008	2009	2010	2011
GDP, constant 2000 prices (\$ billion)	742.1	714.7	709	715.4
GDP growth rate (%)	1.1	-3.7	-0.8	0.9
GDP, constant 2000 prices, per capita (\$)	16,607	15,843	15,581	15,594
Inflation (%)	4.5	-0.3	0.8	1.1
Exports, total as % of GDP	25.6	22.5	21.6	22
Imports, total as % of GDP	31.5	26.2	25.4	24.9

Mid-year population, total (million)	44.7	45.1	45.5	45.9
Unemployment rate (%)	11.3	18	19.3	18.9
Doctors per 1,000 people	5	5	5	5.1
Mobile penetration (per 100 people)	121.4	124.8	127.8	130.5

Table 11. Spain – Key fundamentals. (Datamonitor, 2013)

○ **Political Analysis**

- In 2010, the prime minister has launched a cross-party "anti-crisis" commission aimed at arriving on a consensus to address the severe and ongoing recession. Additionally, in 2010, the government aims to improve the efficiency of the public administration system across ministries. (Datamonitor, 2013)
- The normal working hours must average 40 hours per week maximum of actual work, calculated on an annual basis.

○ **Economic Analysis**

- In 2010, the government set out its proposals to grant more loans to small businesses amongst other measures on which it hopes to obtain cross-party support to revive its stumbling economy. The Economy Ministry listed a total of 55 measures, which also included a committee to analyze Spain's energy strategy for the next 25 years. The government has approved a fiscal stimulus package to increase investment activities, particularly in construction, and has resorted to the public-private participation (PPP) model to provide new investment avenues for private participation. (European Commission et. al, 2013)
- Between 2000 and 2007, Spain enjoyed a booming economy, with annual growth rates between 2.7 % and 5 %, boosting also tax revenues until 2007. Coming from a low level compared to EU-27, the total tax-to-GDP ratio in Spain peaked in 2007 at 37.1 %, 2.3 percentage points below 39.4 % of the EU-27 weighted average. During the years after, Spain experienced a strong impact from the economic crisis; GDP growth crashed from an increase of 3.5 % in 2007 down to a 3.7 % fall in 2009. In 2011 there was a weak recovery of 0.7 %. Tax revenues dropped thus from a high of 37.1 % of GDP in 2007 to a new low of only 30.7 % in 2009, and increased only slightly in 2011 to now 31.4 %. The steep decline of more than 5 percentage points between 2007 and 2011 compares to a much more limited decline of tax revenues at the level of EU-27 of only 0.6 percentage points over the last four years. This implies that after having approached the EU-27 weighted average in 2007, in 2011 the total tax ratio in Spain is now again some 7.4 percentage points

lower than the EU-27 arithmetic average. (European Commission et. al., 2013).

○ **Social Analysis**

- The labor market of Spain is moving from a system of temporary contracts to permanent contracts. It will provide long-term predictability to employers with respect to available employees. (Datamonitor, 2013)
- The impact of African immigrants coming from Sudan, Morocco and other poor African countries has flooded the Canary Islands and much of the southern Spanish shores.
- Unemployment (Table 12) in rural areas jumped from 8% in 2007 to more than 26 per cent in 2012, while in urban areas it increased slightly less, from 7.8% to 24 per cent over the same period. The national average in 2012 is just under 25%. (International Labour Organization, 2013)

Unemployment Rates in Spain	2007	2012
Global	7.9%	24.6%
Rural areas	8.3%	26.1%
Urban areas	7.8%	24%
Northern regions	5.9%	15.4%
Southern regions	11%	32.8%
Madrid	6.2%	18.9%
Barcelona	6.2%	21.7%
Jaén (Andalucia)	11.7%	37%

Table 12. Unemployment Rate in Spain. (International Labour Organization, 2013)

- The growing sense of dissatisfaction with anti-crisis measures has led to different types of protest. The rise in the number of protests in rural areas of Spain is consistent with the ILS social unrest index for Spain (Figure 16), which shows a steady increase between 2006 and 2011 and a main surge in 2009. (International Labour Organization, 2013).

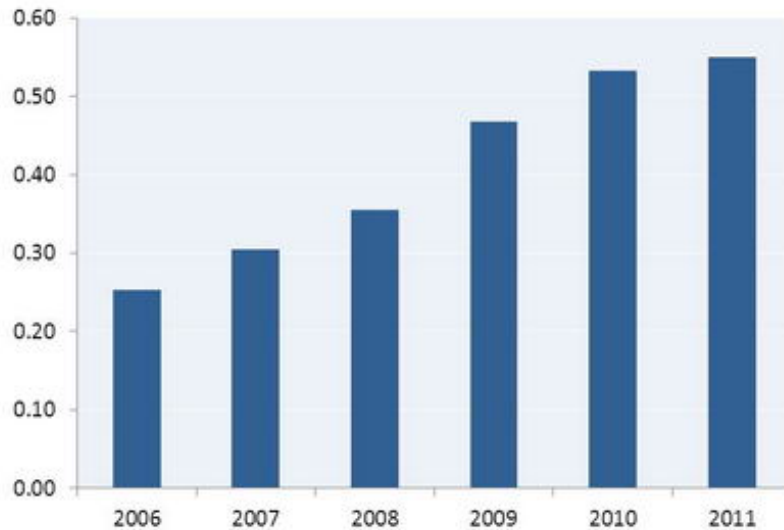


Figure 16. Social unrest index in Spain, 2006-2011 (scale of 0 to 1). Source: ILS estimates based on Gallup World Poll Data, 2012.

○ Technological Analysis

- Spain has been slow in adopting technological advancements compared to the other EU countries, although policy measures have been undertaken in this regard. Spain has the 16th place on the European innovation index in a list of 27 nations. Total expenditure on R&D as a percentage of GDP stood at around 1.2% in 2007–08. Although it performs well in terms of knowledge creation, the innovation climate in Spain has not been very forthcoming. The situation has arisen because of the larger role of the public sector with respect to R&D development. The private sector has limited participation in enhancing R&D levels in the country. (Datamonitor, 2013).

4.1.3 Analysis of Stakeholders

This analysis is performing taking into account each type of stakeholders. In some cases will be taking into account the data of the total country (Spain) and in others the region (Catalonia).

• Citizens

As shown in Chapter 3, we analyze the citizens by using the Human Capital Index. This indicator is based on the reports of United Nations about E-Government from 2004 to 2012. (UNPAN, 2005) (UNPAN, 2008) (UNPAN, 2010) (UNPAN, 2012).

The following chart (Figure 17) illustrates the Human Capital Index of Spain from 2004 to 2012. We can see that in 2004 and 2005 there was not change, in both years the index was 0.97. The year with the highest value was 2008; in 2008 Spain

had a strong improvement since 2004. However, after 2008, we can see that Spain had an enormously decrease. In 2010, the index declined to 0.9792 and in 2012, the index dropped to 0.9409. We can see an evident decrease from 2008 to 2012.

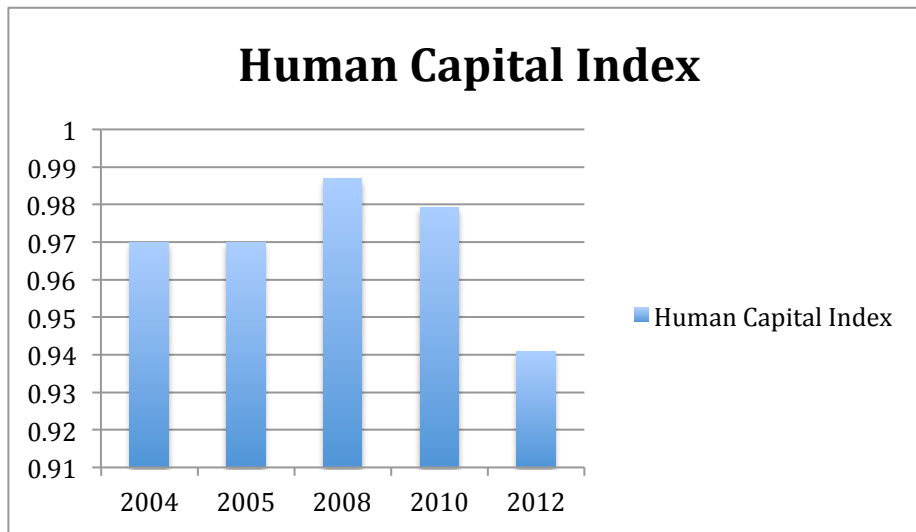


Figure 17. Human Capital Index of Spain 2004-2012

In order to analyze in a deep way the behavior between 2008 and 2012, we took the values of each sub-index used to determine the total Human Capital Index in these years. In the Table 13 can be observed that the Adult Literacy is the sub-index that has the most important decrease. Spain started in 2008 with 99% of Adult Literacy and in 2012 was registered 97%.

Year	Adult Literacy (%)	Enrollment (%)	Human Capital index
2008	99	98.049	0.9868
2010	97.9	97.96	0.9792
2012	97.68	100.73	0.9409

Table 13. Sub-indexes of Human Capital Index of Spain in 2008, 2010 and 2012.

Table 14 shows the leading countries, plus Spain, showing the ranking of each country based on the Human Capital Index. This index is evaluated from 0 to 1, being 1 the best country in a given index. In the table, we can see that Spain has remained in a stable position in the years 2008, 2010 and 2012 between the 9th and the 11th place. However, it is important underline that the largest difference between the indexes of Spain with the leading countries was in 2012. In 2008 and 2010 the difference was very small. In 2008, the index's Spain was 0.9868 with Australia as a first country with 0.9933. In 2010 index's Spain was 0.9792 with Cuba as a first country with 0.9987. But, in 2012, index's Spain was 0.9409 whereas Australia as the first country had 1.

Year	Rank	Country	Index Value
2008	1	Australia	0.9933
	2	Denmark	0.9933
	3	Finland	0.9933
	9	Spain	0.9868
2010	1	Cuba	0.9987
	2	Australia	0.9933
	3	Denmark	0.9933
	12	Spain	0.9792
2012	1	Australia	1
	2	New Zealand	0.9982
	3	Cuba	0.9684
	11	Spain	0.9409

Table 14. Leading Countries and Spain in the Human Capital Index.

- **Employees and Job Seekers**

These types of stakeholders are evaluated taking into account the statistics related with the number of people employed and unemployed and the statistics related with the level of education. These statistics were taken from INE⁴. We have decided to evaluate only the region of Catalonia, taking into account that the SOC system operates just in this region of Spain.

The Table 15 and Table 16 show the average of the number of employed and unemployed people in Catalonia between 2007 and 2011, taking into consideration different levels of Education.

Data type			Average of Number of Employed People by level of education attained				
Units			Thousands of people				
Time and frequency			2007	2008	2009	2010	2011
Territory	Education Level	Gender					
Catalonia	Illiterates	Males	9.8	15.65	8.2	5.8	4.6
		Females	4.4	4.4	2.8	3.5	3.4
		Total	14.2	20.05	11	9.3	8
	Primary education	Males	364.8	362.6	323.2	309.1	235.4
		Females	204.2	222.5	205.6	205.8	171.1
		Total	569	585.1	528.8	514.9	406.5
	First stage of	Males	554.7	517.1	443.2	428	454.1

⁴ <http://www.ine.es/>

	secondary education and the corresponding training and labor insertion	Females	339.8	332.1	290.2	288.1	306.6
		Total	894.5	849.2	733.4	716.1	760.7
	Second stage of secondary education and the corresponding training and labor insertion	Males	507.1	477.2	396.7	402.1	409
		Females	398.5	406.4	378.9	360.9	352
		Total	905.6	883.6	775.6	763	761
	Training and labor insertion with secondary degree (2nd stage)	Males	0.4	0.6	2.2	0.7	0.4
		Females	0.9	0.7	1.2	0.4	0.4
		Total	1.3	1.3	3.4	1.1	0.8
	Higher education, except doctorate	Males	569.2	579.1	557.9	541.3	526.3
		Females	539.9	556.7	556.8	570.2	589.5
		Total	1109.1	1135.8	1114.7	1111.5	1115.8
	Doctorate	Males	11.3	12.4	14.4	12.8	17.3
		Females	6	7.4	7.7	9	9.4
		Total	17.3	19.8	22.1	21.8	26.7
Total		Males	2017.3	1964.65	1745.8	1699.8	1647.1
		Females	1493.7	1530.2	1443.2	1437.9	1432.4
		Total	3511	3494.85	3189	3137.7	3079.5

Table 15. Average of Number of Employed People by level of education attained. (INE).

Data type			Average of Number of Unemployed People by level of education attained				
Units			Thousands of people				
Time and frequency			2007	2008	2009	2010	2011
Territory	Education Level	Gender					
Catalonia	Illiterates	Males	3.1	6.1	5.1	3.6	4.9
		Females	1.7	1.4	4.2	2.6	7.6
		Total	4.8	7.5	9.3	6.2	12.5
	Primary education	Males	28.8	67.6	11.2	116.3	104.1
		Females	26	29.3	49.7	61.9	55.3
		Total	54.8	96.9	60.9	178.2	159.4
	First stage of secondary education and the corresponding training and labor insertion	Males	33.4	56.8	119.7	136.8	138
		Females	40.7	45.2	85	89	96.6
		Total	74.1	102	204.7	225.8	234.6

	Second stage of secondary education and the corresponding training and labor insertion	Males	31.3	39	72.5	73.2	93.1
		Females	33.5	43.2	70.7	68.1	83.5
		Total	64.8	82.2	143.2	141.3	176.6
	Training and labor insertion with secondary degree (2nd stage)	Males					
		Females		0.6	0.25		0.1
		Total	0	0.6	0.25	0	0.1
	Higher education, except doctorate	Males	22.2	25.5	47.9	59.6	66.8
		Females	24.4	31.2	48.6	65.4	83.1
		Total	46.6	56.7	96.5	125	149.9
	Doctorate	Males	0.5			0.3	
		Females	0.6	0.8	0.6	0.7	1.1
		Total	1.1	0.8	0.6	1	1.1
	Total	Males	119.3	195	256.4	389.8	406.9
		Females	126.9	151.7	259.05	287.7	327.3
		Total	246.2	346.7	515.45	677.5	734.2

Table 16. Average of Number of Unemployed People by level of education attained. (INE).

Table 17 shows the number of people graduated of a University in Catalonia in 2008. There are no data for 2007 and between 2009 and 2011. The statistics take into account the public and private universities, the public and private ownership and ownership of other public institutions and all the field of studies proposed by the INE.

Data Type		Student body who finished studies in 2008
Year of reference		2008
Territory	Gender	
Catalonia	Males	10625
	Females	16198
	Total	26823

Table 17. People graduated in a university in 2008. (INE).

- **Companies**

To analyze this type of stakeholder, it was necessary to identify the Number of companies that published offers during 2008 to 2011. Additionally, it is useful to define the number of actions carried out during this period.

The following chart (Figure 18) shows the number of companies that published offers from 2009 to 2011. In the graph, we can see that there is a small increase between 2009 and 2010. The number of companies that uses SOC System in 2008 was 1188 and in 2010 was 1242. However, 2011 was the year with the highest number of companies registered in SOC System, 2206 companies.

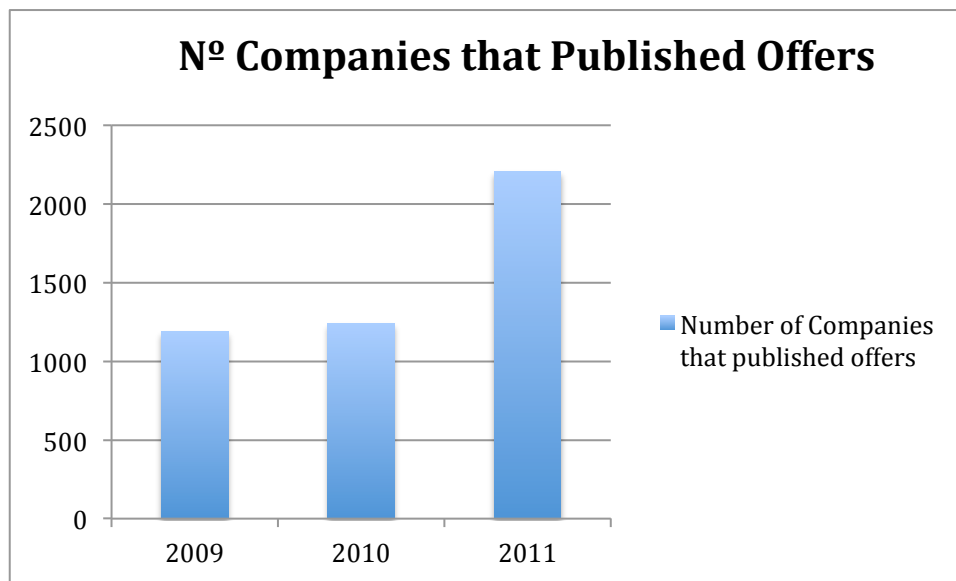


Figure 18. Number of Companies that Published Offers in SOC

In order to publish the offers, companies use a portal called “Feina Activa” offered within the SOC System. It is the free public jobs portal that the SOC offers to Catalan citizens and businesses by acting as an intermediary in the labor market (Memorias de actividades del SOC, 2006 – 2011). This resource allows self-management of offers and sets a new stage of interaction on the Internet, which is compatible with the face model of intermediation labor in the job offices. It should be noted that since this site became operational in 2009, offers that come in the form required by SOC are incorporated directly therein. In 2009, 1,188 companies have been validated in “Feina Activa”. In that year, has been managed 2,532 offers of jobs, 984 of which are in the private sector.

During 2010, 1242 companies, of 3.060 activated on the portal, have published offers, representing 40.6% of the total. In 2010, with the aim of improving, SOC had been put into operation a new version of "Feina Activa". Among the improvements into the new version, SOC offered the option to perform job searches indicating only one category, a province or a municipality and also incorporating text search of jobs, that is, by keyword. Moreover, the portal allows candidates to incorporate a video or a personal presentation within their resume.

In 2011, SOC has introduced a number of innovations that have become the portal "Feina Activa" in a place where the offers of Catalonia are centralized. This offers can come from others sites such as infoempleo.com and yaencontre.com. SOC has signed an agreement with them; therefore, for people interested in their offerings, they have to enter to "Feina Activa" portal to formalize their candidacy. During 2011, 2206 companies have published offers in "Feina Activa" portal.

- **Educational Institutes**

SOC offers other types of service, such as training services. The training services help to improve the professional skills of job seekers in order to increase your chances of getting a job; through education, they improve the professional knowledge and skills necessary to suit the labor market needs.

The training services with more relevance offered are (Memorias de actividades del SOC, 2006 – 2011):

- **Train and Hire:** This is a line of funding for companies that need to hire employees. The program provides training aimed at equipping unemployed workers with the vocational skills for a specific job.
- **Initial Vocational Qualification Program (PQPI):** The program helps unemployment people equal to or over 16 and under 25, who have not obtained a graduate degree in secondary education. The program offers a basic and vocational training in order to allow a social inclusion and find a job.
- **Centers for Innovation and Vocational Training (CIFO):** Its aim is to ensure and promote the training and qualification of people. To achieve these objectives, there is a network of centers of excellence in training professional employment, constituted by eight innovation centers of occupational training.
- **Credit for training at work:** It is program that offer loans without interest for unemployed people for courses of professional improvement.
- **FP.CAT:** The program seeks to integrate training subsystems and the creation of a network of centers more tailored to the needs of individuals and businesses. The professional skills acquired allow participants to obtain professional certificates or qualifications by the Department of Enterprise and Employment and the Department of Education.
- **e-formació:** It is a training program that works as a line of distance, which aim is to help the unemployed people offering them a continuous learning, flexible and with high quality, related to creativity, innovation, entrepreneur and develop the abilities to the inclusion in the competitive labor market.

- **Connecta't:** It is a computer literacy program that helps to develop the basic computer skills to unemployed people in order to increase the opportunities in the job-seeking process.
- **Training for employment offers by means of training plans in priority professional areas:** These are actions to train for employment offers by means of training plans in priority professional areas, such as logistics, distribution, transport and communications, tourism, trade, etc.; aimed particularly at the unemployed.
- **Training for employment offers by means of training plans in local organizations:** This involves promoting grants to local organizations for developing training actions by means of training plans in priority professional areas.
- **CerTIC:** These are course based on blended learning which provide training and certification in ITC – Information and Communication Technologies to the unemployed people.

Table 18 shows the number of people who draw benefit from these training services between 2007 and 2011.

Training Services	2007	2008	2009	2010	2011
Train and Hire	-	719	892	1,144	2,051
Initial Vocational Qualification Program (PQPI)	-	2,396	2,223	2,247	2,643
Centers for Innovation and Vocational Training (CIFO)	3,324	4,301	1,105	9,330	5,444
Credit for training at work	5444	-	3524	2654	-
FP.CAT	-	-	1105	1900	827
e-formació	-	-	28571	36831	27558
Connecta't	-	-	4424	3512	5473
Training for employment offers by means of training plans in priority professional areas	-	-	-	130356	88837
Training for employment offers by means of training plans in local organizations	-	-	-	30842	21212
CerTIC	-	-	-	-	1529
Total	8,768	7,416	41,844	218,816	155,574

Table 18. Training Services in SOC.

- **Competitors**

In this part, we consider the EIS that are offering similar services and are based on job seeking. We have found that in this area the most significant competitors are InfoJobs, JobandTalent and LinkedIn.

- InfoJobs⁵ is a private employment web specialized in Spain. Created in 1998, has a staff of 250 professionals, its main office is in Barcelona and it has 10 office in the Spain territory. Today, it belongs to the Scandinavian group Schibsted.
- Jobandtalent⁶ is a recruiting platform that matches professionals with relevant job opportunities using linguistics based algorithm. The objective is to use the linguistic analysis to alert candidates to jobs they might otherwise have missed. Two young entrepreneurs founded the company in 2009. In October 2011, Jobandtalent opened a new office in Barcelona. Currently, it has opened in London and it is raising funds to expand to the United States and Latin America.
- LinkedIn⁷ is a professional social network with 300 million members in over 200 countries and territories around the globe. It started out in 2002, and it officially launched on May 5, 2003. In this social network, the users can create profiles with the resumes describing in detail the current and prior work experiences. Additionally, it allows connect with colleagues and companies with the aim to build a network that can help the professional career.

- **Public/Private Administration**

The employment network consists of 70 employment offices distributed throughout Catalonia; 46 in Barcelona, 8 in Girona, 7 in Lleida, 9 in Tarragona these offices are the point of entry to the services provided by the SOC for both people and businesses. Additionally, there are also private job placement agencies. They were created in order to reduce unemployment and increase economic productivity. They are regulated and the agencies must be authorized by the SOC (Memorias de actividades del SOC, 2006 – 2011).

4.1.4 Analysis of SOC's System

In this section we present the evaluation of SOC's system using our evaluation model, measuring the level of maturity, usability and integration of the system and the creation of value for its users.

4.1.4.1 Strategic Dimension

This dimension is divided in three main components:

Objectives

- *Goals definition*

According to the memories of SOC, the main objectives of the system are:

⁵ <http://www.infojobs.com/>

⁶ <http://www.jobandtalent.com/>

⁷ <http://www.linkedin.com/>

- a) Organize, plan, schedule and execute the actions arising from the occupational employment policies, and make monitoring and control.
- b) Offer and provide information services and comprehensive career guidance workers, both in active employment status as unemployed and businesses.
- c) Manage programs and continuing vocational training and ensure their coordination with formal training.
- d) Managing labor mediation regarding the supply and demand in the labor market through a single public network in Catalonia, and execute authority over placement agencies.
- e) Promote the widespread practice of human resource management that optimal capacities and skills acquired by workers and encourage the sustainable competitiveness of enterprises.
- f) Articulate in accordance with the applicable legislation, in collaboration with organizations and cooperating partners.
- g) Run the functions relating to the obligation of employers to communicate labor contracts and that are also notifying the termination.
- h) Execution of the duties relating to compliance with the obligations of employers and employees and, where appropriate, to exercise disciplinary powers in matters relating to employment and unemployment in terms established by applicable law.
- i) Managing actions to promote employment, with particular attention to groups most at risk of social exclusion.
- j) Promoting self-employment in coordination with other organizations that promote the social economy and the creation of micro.

- *Goals completion*

In order to accomplish these goals, the SOC system has implemented a group of policies that aims at covering all these objectives, developing different programs and activities. The most recent statistics about these policies are presented in Table 19.

Program	Amount awarded (€)	Beneficiaries
Counseling services	7,627,341.00	274,621
Professional guidance	5,950,966.84	18,600
Training and retraining	58,628,033.58	152,323
Employment opportunities and recruitment promoting	2,865,736.21	220
Employment and training opportunities	26,120,679.08	4,736
Promoting development and economic activity	5,483,983.17	220
Promotion of mobility (geographic/sectorial)	778,985.00	277
Integrated projects	39,470,345.18	21,494
Other	25,636,000.15	99,622
TOTAL	172,562,070.21	572,113

Table 19. Summary of active employment policy programs. Source: Memorias de actividades del SOC. (2006 - 2011).

- *Level of flexibility of the strategy*
The strategies and objectives of SOC are based on the policies of the European Employment Strategy and the National Work Plans of Spain, which gives as a result a fixed plan built on the goals of all European countries, but at the same time, produces a policy that will be modified according with the needs and the context of the moment.

For these reasons, the strategy will be adapted when the European and Spanish environment change, and not only when the Catalanian context needs an adjustment of the objectives. This constraint reduces the flexibility of the strategy.

Risk Management

Managing risk in a project requires the assessment of the probability of occurrence of threats, and requires also establishing the level impact of these risks to the project.

A methodology to identify and qualify possible risks is the Risk Management Plan (Figure 19). This plan involves the processes of: risk identification, risk assessment, definition of answers to the risks, and monitoring and control. In addition are defined the objectives, activities, responsible and necessary tools to carry out the process.



Figure 19. Risk manage process.

Unfortunately, we don't have enough information about SOC to follow this plan, thoroughly and assess a real map of the risks related to the project.

Future Development Plans

- *Plans and Initiatives*

In order to reach the objectives proposed, the Employment Service of Catalonia, initially set up a list of measures and actions to implement as part of the plan of improvement and growing. Table 20 summarized this information.

Measures	Actions
System Modernization	Transparency System Occupational Employment Catalonia
	System brokerage personalized, effective and efficient
	Occupational guidance
Training	Training programs provided with appropriate conditions and characteristics and flexibility
	Training programs related to emerging industries and new activities
	Training programs aimed at sectors and territories in process of transformation
	Awareness raising and training programs specializing in occupational and continuing training.
Employment Promotion	Promote entrepreneurship in general and also in particular, among women and young people
	Development of individual work, cooperative work and labor in society.
Equal Opportunities	Involve people with specific difficulties: people with disabilities, immigrants, older than 50
	Youth
	Gender Equality
	Employees / temporary
	Other people with special difficulties

Table 20. Measures and actions developed by SOC

These plans were used between 2006 and 2011. However at the end of 2009, the country was suffering a deep economical crisis, and the unemployment rate in Catalonia was 17%, five percentage points higher than the rate of 2008, with a youth (16 to 24 years old) unemployment rate of 38.2 %, and 561,761 unemployed people registered at work offices, which represented an increase of 32.73% compared to the previous year. This context caused that the entity had to act and establish new additional measures. The new active policies implemented were:

- Modernization the Employment Offices.
- Increase the budget of the programs of Active employment policies

(PAO).

- Manage subsidies of centers and cooperating partners in order to allow them to offer the services of PAO throughout the year.
- Adapt PAO needs of the labor market.

In order to carry out the new policies, was developed the following actions from 2009 to 2011:

- Incorporation of new technologies in the provision of services
- Increased training
- Advance publication of application to ensure the supply of occupational programs
- Structure and extension of professional guidance for employment
- Subsidies for workers from of textiles and clothing industries.
- Relocation of workers laid off
- Temporary program of protection for unemployment and insertion
- Income Training for self-employed people
- Agreement on measures for youth employment in Catalonia

- *Resources*

Capital resources for the development and maintenance of SOC, are funds afforded by the Government of Catalonia, the FSE/LEONARDO/FEAG and the Central Administration. Table 21 shows funds providers and its distribution.

	Government of Catalonia	FSE/LEONARDO/FEAG	Central Administration	Total
I. Remuneration Staff	€ 51,736,747.01		€ 18,158,650.45	€ 69,895,397.46
II. Current Goods and Services	€ 26,894,173.02	€ 1,099,203.14	€ 15,031,503.73	€ 43,024,879.89
III. Financial Expenses				
IV. Current Transfers	€ 48,400,669.01	€ 31,687,836.16	€ 334,868,790.98	€ 414,957,296.15
VI. Real Investments	€ 3,155,327.41		€ 2,419,458.43	€ 5,574,785.84
VII. Capital Transfers	€ 74,800.00		€ 75,541.57	€ 150,341.57
VIII. Financial Assets	€ 5,030,000.00			€ 5,030,000.00
TOTAL	€ 135,291,716.45	€ 32,787,039.30	€ 370,553,945.16	€ 538,632,700.91
%	25.12%	6.09%	68.79%	100.00%

Table 21. Funds provision per expenditure. Source: Memorias de actividades del SOC. (2006 - 2011).

Regarding to Human Resources, until to 2011 the number of employees working in SOC were 1,345. In Table 22 is presented the distribution of the staff in SOC between 2007 and 2011, by gender and professional category.

		2007	2008	2009	2010	2011
By Gender	Men	429	425	439	408	379
	Women	1025	1,008	1,028	996	966
	Total	1454	1433	1467	1404	1345
By Professional Categories	Junior	44	41	46	41	36
	Administrative Assistant	564	552	543	430	412
	Administrative Technician	223	223	231	293	277
	Technical Manager	308	298	311	309	301
	Senior Technician	315	319	336	331	319
	Total	1454	1433	1467	1404	1345

Table 22. Distribution of SOC staff by gender and professional categories. Source: Memorias de actividades del SOC. (2006 - 2011).

- *Infrastructure growth*

SOC provides a network of 70 offices and entry points for self serve, and also has implemented an online platform to increase the attention to multiple users, facilitating procedures and improving the access to job offers available.

Catalan Employment Service bases its online services in a computing platform known as GIA and the SOC website. The technological infrastructure is composed by:

- Two web servers, each with an instance of Apache serving requests for production. These servers are shared with instances integration and preproduction GIA and instances of integration, pre-production and production web.
- Two application servers, each with an instance of Tomcat.
- Two servers for Oracle RAC, Oracle serving with balancing and high availability through two IPs. These servers are shared with the BD integration and preproduction GIA and the BD integration, pre-production and production web.

4.1.4.2 Economic and Financial

This dimension accounts the economic value of the organization, taking into account the resources, costs and revenues, and in the financial part including cash inflows and outflows, related to the services offered.

SOC is an autonomous body with legal personality, administrative autonomy, and full economic and financial capacity to execute the functions assigned to it in order

to reach its goals. According with Article 24 of Law 17/2002 creation of the SOC, its financial resources consist of:

- Provisions will be specified in the budget of the Government.
- The return of goods assigned to its gains.
- The exercise of its functions.
- Grants, contributions and donations granted by people or public or private entities.
- The fees, rights and other equity benefits that apply.
- Any other resource that the law allows.

Expenditure budget

The planned spending budget for SOC in 2011 is presented in Table 23.

	Initial Budget	Final Budget	% Budget Increase	% Final Budget
I. Remuneration Staff	€ 51,335,000.00	€ 72,446,508.23	41.12%	10.39%
II. Current Goods and Services	€ 41,398,236.15	€ 47,259,989.72	14.16%	6.78%
IV. Current Transfers	€ 352,646,223.41	€ 561,906,025.58	59.34%	80.56%
VI. Real Investments	€ 5,650,327.41	€ 9,861,153.54	74.52%	1.41%
VII. Capital Transfers	€ 74,800.00	€ 1,007,961.85	1247.54%	0.14%
VIII. Financial Assets	€ 5,030,000.00	€ 5,030,000.00	0.00%	0.72%
TOTAL	€ 456,134,586.97	€ 697,511,638.92	52.92%	100.00%

Table 23. SOC budget for 2011. Source: Memorias de actividades del SOC. (2006 - 2011).

The final budget for 2011 has been increased in 52,92% for a final value of 697.511.638,92 euros. This increment was caused for budgeted modifications in the credit line.

The historical expenses budget is summarized in Table 24:

Year	Initial Budget	Final Budget	% Budget Increase
2011	€ 456,134,586.97	€ 697,511,638.92	52.92%
2010	€ 526,305,022.89	€ 835,316,590.04	58.71%
2009	€ 387,810,282.65	€ 766,565,397.78	97.67%
2008	€ 329,719,187.68	€ 722,068,360.03	118.99%
2007	€ 304,100,000.00	€ 723,095,471.06	137.78%
2006	€ 298,729,000.00	€ 730,238,114.86	144.45%

Table 24. Expenses budget for SOC between 2006 and 2011. Source: Memorias de actividades del SOC. (2006 - 2011).

This data shows how the initial budget has been adjusted every year, trying to correct the misalignment with the financial part, in order to avoid insufficiency of funds.

As showed in Table 21, SOC's expenditures are covered with funds from different regional and state entities, depending of these resources for its operation. With the crisis from last years and the increasing unemployment rate in the region, the Generalitat of Catalonia has been evaluating the possibility of privatize the service, in order to keep it working and avoid the rising economical problems.

4.1.4.3 Organizational and Technological

SOC bases its activities in physical and online offices, where users can access to the services of professional orientation and consulting to apply to the jobs offers available in the system.

Table 25 presents data related to the number of offers and requests received by SOC in 2011.

	Barcelona	Girona	Lleida	Tarragona	Terres De l'ebre	Other SOC Entities	Total
Offers registered	10,637	1,784	1,767	1,841	778	186	16,993
Places offered	23,183	3,299	3,116	4,025	1,469	550	35,642
Offers disseminated on the web	6,394	884	514	966	393	0	9,151
Candidates obtained	263,043	29,626	27,512	50,570	18,809	324	389,884

Table 25. Job offers managed by SOC in 2011. Source: Memorias de actividades del SOC. (2006 - 2011).

The automation of processes, has allowed an increase of the number of users treated per year. According with the work of David Garcia (Garcia Berned, D., 2013), in 2011 SOC received 30% more requests than the previous year. Table 26 contents the information related to the number of processes attended by the system in 2011.

	Amount	%
Job demand renewals	984,729	39.7%
CV consults	80,141	3.2%
Administrative situation changes	26,571	1.1%
Job offers introduction	1,654	0.1%
Other	1,385,540	55.9%
Total processes	2,478,635	100.0%

Table 26. Processes done through 'SOC' website channel 2011. Source: Garcia Berned, D. (2013).

Additional to online service, SOC also offers the possibility of direct consulting with an assessor in an offices or call to Telephone 012. The number of requests processed by each channel in 2011, are summarized in Table 27.

	Total	Self-service Point	Website	Telephone 012
Total number of procedures	4,703,589	2,140,127	2,478,635	84,827
%	100%	45.50%	52.70%	1.80%

Table 27. Processes attended by channel. Source: Garcia Berned, D. (2013).

4.1.4.4 Services Provision

The employment network of SOC consists in 70 offices in Catalonia, offering different services for people and companies.

In Table 28, is shown in detail the number of movements in employment demands and the number of movements in employment offers recorded by the SOC between 2007 and 2011.

Year		2007	2008	2009	2010	2011
Employment Demands	New Registrations	181,360	219,506	262,188	181,947	164,542
	Registrations with recovery of previous data	616,046	793,169	966,358	977,723	1,052,511
	Renewals	887,886	1,090,866	1,838,656	2,082,133	2,065,886
	Modifications of personal details and/or Curriculum	834,293	1,084,864	1,366,949	1,330,894	1,413,095
	Total	2,519,585	3,188,405	4,434,151	4,572,697	4,696,034
Employment Offers	Registered Offers	42,611	29,499	21,733	22,671	16,993
	Jobs Offered	81,916	58,050	45,292	57,499	35,642
	Offers Published on the Website	36,511	23,982	15,795	12,322	9,151
	Candidacies Obtained	757,486	665,867	587,891	532,828	389,884
	Total	918,524	777,398	670,711	625,320	451,670

Table 28. Demand and employment offers through SOC system. Source: Memorias de actividades del SOC. (2006 - 2011).

Beyond employment services, SOC offers also other types of service, such as, orientation and training services. The orientation services are in charge of providing career guidance for the support of employment and self-employment tailored to each specific individual. The training services help to improve the professional skills of job seekers in order to increase your chances of getting a job;

through education, they improve the professional knowledge and skills necessary to suit the labor market needs.

The orientation services offered are:

- Guidance from the employment offices: These offices help the user to find a job, contributing to build a bridge between current employment of the user and the job that the user wants to find in the future.
- Intensive Job Search Classes (ARIF): Its objective is to accelerate the process of the people registered in SOC that have a professional project defined and viable, in order to incorporate them into the labor market as soon is possible.
- Personalized Placement Itineraries (IPI): It is a program carried out by entities collaborators. Its aim is to facilitate improving the position in the labor market of job seekers and facilitate detecting and boosting self-employment initiatives.
- Reinicia't Project: It is a program for people over 50 who are registered in SOC offering them occupational information, guidance, motivation, analysis of skills, basic training in professional skills, professional practices and support the insertion and subsequent monitoring.
- Employment Intermediation at Origin Service (SILO): Help to hire foreign people with the aim to contribute in the regulation of migration flows and the inclusion of immigration.
- Agricultural campaign: its aim is to regulate and manage the flow of seasonal workers in the field and contribute to the dignity of work in the field.

Table 29 shows the number of people that had use the different SOC services since 2007 until 2011.

Guidance Service	2007	2008	2009	2010	2011
Guidance from the employment offices	-	-	91,484	105,154	66,692
Intensive Job Search Classes (ARIF)	-	635	2,049	3,683	4,393
Personalized Placement Itineraries (IPI)	-	-	28,056	31,161	43,213
Reinicia't Project	-	-	-	1,200	1,053
Employment Intermediation at Origin Service (SILO):	577	344	972	728	-
Agricultural Campaign	12,744	8,971	6,903	12,113	-
TOTAL	13,321	9,950	129,464	156,049	115,351

Table 29. Number of beneficiaries of SOC' services between 2007 and 2011. Source: Memorias de actividades del SOC. (2006 - 2011).

4.1.4.5 Social Outcomes

As part of the general objectives of SOC, the entity has developed many different programs for its users, not only helping them to search for a job, but also to giving them the opportunity to improve their knowledge and skills.

The main programs implemented are:

- *Guidance Services*: is a service developed to help customers to define their vocational project, improving employability through individual tutorial sessions.
- *Training and Retraining*: is a program offered by SOC, which aims to improve the vocational qualification of job seekers, improving their chances of finding a job and adapting them to the needs of the labor market.
- *Employment Opportunities and Training*: this program offers actions and measures to acquire vocational training or experience, aimed at qualification or job placement.
- *Employment Opportunities and Encouraging Hiring*: SOC promotes different types of grants for carrying out actions aimed at obtaining employment.
- *Promotion of Equal Employment Opportunities*: this area is referred to the actions and measures that promote equal opportunities related to access to employment for men and women.
- *Opportunities for Groups With Special Difficulties*: this program aims to help groups that have special difficulties in accessing and remaining in employment. The activities related to this program, have been developed to support victims of gender violence, victims of domestic violence, and people with disabilities or those in a situation of social exclusion.
- *Promotion of Development and Economic Activity*: SOC aims to support the creation of employment through the development of new business activities and promoting local economic development.
- *Integrated Projects*: this projects have been developed to support different communities inside the Catalanian region, creating an integration between them, that help to generate employment offers and to find easily people to fulfill the demand.
- *Measures Against the Crisis*: the current economic situation has led SOC to implement a number of actions against the crisis. These measures aimed primarily at unemployed people without economic coverage.

- *Others:* along with the different programs presented above, SOC has developed other initiatives to improve the seasonal employment in the agricultural sector, or the support in translation and linguistic assistance for citizens.

Table 30 present the different programs developed by SOC, with their activities, budget and the number of people benefited by them during 2011.

Programs	Projects	Budget Assigned	Beneficiaries
Guidance Services	170,288	€ 17,842,018.95	115,351
Guidance from the employment offices	170,288	N/A	66,692
Intensive Job Search Classes (ARIF)	N/A	N/A	4,393
Personalized placement itineraries (IPI)	N/A	€ 11,497,089.84	43,213
Reinicia't	N/A	€ 1,344,929.11	1,053
Job Training Credit	N/A	€ 5,000,000.00	N/A
Training and Retraining	7,145	€ 100,788,338.14	155,574
Training for employment offers by means of training plans in priority professional areas	5,036	€ 64,983,934.44	88,837
Training for employment offers by means of training plans in local organizations	1,296	€ 19,978,394.72	21,212
Initial Vocational Qualification Program (PQPI)	165	€ 6,976,930.06	2,643
Train and Hire	141	€ 3,629,150.62	2,051
CIFO	374	€ 2,503,688.92	5,444
FP.CAT	N/A	€ 691,178.10	827
e-Formació	83	€ 1,081,398.00	27,558
Connecta't	N/A	€ 243,743.28	5,473
CerTIC	50	€ 499,920.00	1,529
Catalan courses for unemployed people with no knowledge of the language	N/A	€ 200,000.00	N/A
Employment Opportunities and Training	58	€ 13,719,860.00	4,120
SUMA'T	58	€ 13,719,860.00	4,120
Employment Opportunities and Encouraging Hiring	1,234	€ 84,471,255.47	12,172
Non-profit organization and public university employment plans	266	€ 4,787,061.28	561
Local organization employment plans (including those of the emergency plan and residual)	901	€ 72,610,249.48	10,432
Seasonal agricultural campaign employment plans	67	€ 617,154.81	138
Employment plans - Interdepartmental agreements	N/A	€ 4,056,789.90	1,041
Small grants for companies for encouraging hiring of unemployed people	N/A	€ 2,400,000.00	N/A
Promotion of Equal Employment Opportunities	29	€ 1,968,483.39	1,427
Guidance and support programs for labor insertion of women in a situation of vulnerability due to unemployment	29	€ 1,649,983.26	1,427
Catalan network of local equality agents	N/A	€ 318,500.13	N/A
Opportunities for Groups With Special Difficulties	124	€ 8,432,260.70	6,033
Special groups	122	€ 7,367,684.70	5,095
Innovative programs to promote structural changes toward equal opportunities in the workplace	2	€ 1,064,576.00	938
Promotion of Development and Economic Activity	114	€ 10,397,337.48	299
Actions to encourage local and regional development	N/A	€ 1,461,659.59	N/A
Promotion of local development	114	€ 1,053,037.67	N/A

Hiring and extension of employment and local-development agents (AODL)	N/A	€ 7,882,640.22	299
Integrated Projects	747	€ 39,995,290.05	13,835
Employment in the Neighborhoods	678	€ 37,322,993.20	12,046
Employment in the 7 Counties	69	€ 1,521,676.78	1,789
Actions for employment with local bodies	-	€ 1,150,620.07	-
Measures Against the Crisis	N/A	€ 3,317,894.07	36,795
Prepara	N/A	N/A	36,064
Subsidies from the European Globalization Adjustment Fund	N/A	€ 3,317,894.07	731
Others	4,482	€ 82,195,872.98	135,483
Supply-oriented training principally for the employed*	4,202	€ 59,341,517.31	131,539
Plan for implementation of the PAO and local development in the city of Barcelona (2010-2011)	N/A	€ 14,646,146.87	N/A
Agreements not accounted for in other programs (FIAP, CIRE Vocational training program, INFORM)	280	€ 8,208,208.80	3,944
GENERAL TOTAL	184,221	€ 363,128,611.23	481,089

N/A: not available

* It foresees that the participation of people in unemployment will be around 30%

Table 30. Summary of the SOC active employment policies for 2011. Source: Memorias de actividades del SOC. (2006 - 2011).

4.1.4.6 Political and Democratic

In order to provide information to its users, SOC has implemented a list of activities that aims at presenting the data and services offered by the system. To have a more global vision of what has been done since the beginning of the SOC, Table 31 presents the programmed activities and its real implementation, showing a completion rate.

Type Activity	Indicator	Programming 2007-2011	Foreclosure	%
1	Number of public activities and events	115	141	122.61%
1.1	Turnout	130,000	212,971	163.82%
2	Number of diffusion actions	314	114	36.31%
3	Number of external publications	65	76	116.92%
3.1	% Distributed publications / edited	95.00%	98.75%	96.88%
3.2	Number of distribution points	80	80	100.00%
4	Number of Web pages	2	2	100.00%
4.1	Number of Visits	1,700,000	6,026,465	354.50%
5	Number of advertising media	185	99	53.51%
6	Number of internal documentation distributed	58	65	112.07%
6.1	% Of covered agencies	100.00%	99.00%	99.50%
7	Number of networks of information and publicity	2	2	100.00%
7.1	Number of meetings	47	39	82.98%

7.2	Number of attendees	52	52	100.00%
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Table 31. Activities and public information projects developed by SOC. Source: Memorias de actividades del SOC. (2006 - 2011).

It can be seen that some indicators are keeping a good pace of execution, and also it is possible to observe that all indicators are adjusted for programming and are gradually making some progress in order to reach the final fulfillment for the objectives set

4.2 CASE STUDY: BORSA LAVORO LOMBARDIA (BLL)

4.2.1 Description

The portal Borsa Lavoro Lombardia (BLL), launched in March 2004, is a system for integrated access to services for labor, education and training, creating a network of services where operators, individuals and businesses can meet in a cooperative environment

The system is defined as multi-channel, using alternative channels to communicate: besides the web portal, there is a call center available to get information, to post curriculum vitae, a teletext service, where users can request the display of documents and finally a front office service where people can go in person to have information and get help in submitting their documents

4.2.1.1 Objectives

The main objective of BLL is to create a service model, where employers and workers can interact through job offers, offering the possibility to public and private entities to work together in the construction of a labor market.

The main aims of the project are as follows:

- Develop an environment where all the players, public or private, can interact easily and obtain better results to the offers and request processed.
- Improve service efficiency mainly in the job matching process
- Offer analysis and statistics using collected data, to give accurate and real time information to users and companies.
- Improve service quality offering access to the stored information in the databases.
- Simplify administrative procedures.

4.2.1.2 Services

BLL is a place to find information and answers on key issues related to the world of labor, education and training, offering a multiplicity of data and information in one central database, that is accessible by multiple sources which are not always easy to find by citizens and companies.

The main services offered by BLL are:

- **Education and Training:** developed to increase the integration between education and work to offer a space where user can find solutions to these issues.
- **Training opportunities:** is a set of databases with content organized to give concrete answers to the most varied needs of citizens, especially the younger ones.
- **Trades and Professions:** is a database where is possible to consult profiles, educational backgrounds and employment opportunities of the professional demand in Lombardy.
- **Career guidance:** is a service created to respond to the needs and demands of young people, graduates, workers, unemployed, disabled, women, foreigners and the elderly. In particular, to understand the changes and the opportunities of the education system
- **School Today:** designed for students, is an organized guide to explain the innovations introduced by the reform.

4.2.1.3 Service Structure

BLL is an integrated communication system, which uses different tools, not just the Internet, to encourage the use of Borsa Lavoro Lombardia also to those who have little familiarity with computer technology. Within the alternatives offered by BLL are:

- An active **Telephone Call Center** 840 011 222 where trained operators provide the basic information and also help with the registration and inclusion on the portal of CVs and job offers.
- On the **Channel Rai Utile** is possible to access, in real time, to contents and services provided by the portal. For those who have already entered the curriculum in the portal and uses the Lombardy Regional Services Card, is possible to insert their card into the decoder and immediately can interact with the portal and check if there are jobs compatible with their professional skills and aspirations.
- Since the summer 2004, BLL is located on **Mediavideo of Mediaset**, on page 365, with screens showing complete information, latest news, updates and insights, easily accessible with the TV remote.
- To allow the greatest number of citizens and businesses to use its services, BLL has also set up a **Network of Information Points** distributed in many towns of Lombardy. The BLL's Points of Contact, about 215, are housed in the offices of several organizations, municipalities, associations and employers' associations. In these places is possible to find free Internet terminals connected to the portal where users can take advantage of the service-trained personnel, which help them to create profiles and consult the offers available.
- There are also **Scholastic Information Desks**, opened in 75 public institutions, with Internet terminals available for consultation by students

seeking information for their future work or school, with the assistance of counselors from the school.

4.2.2 Analysis of Environment

The analysis of Environment that consist in the analysis of the external issues that can affect BLL System, will be carried out taking into account the Telecommunication Infrastructure Index and a PEST analysis. In this case, the analysis of Environment of BLL is going to be based on Italy.

- **Telecommunication Infrastructure Index**

As presented for SOC, the Telecommunication Infrastructure Index of Italy is based on the reports of United Nations about E-Government from 2005 to 2011 (UNPAN, 2005) (UNPAN, 2008) (UNPAN, 2010) (UNPAN, 2012).

The chart in Figure 20 shows the Telecommunication Infrastructure Index of Italy between 2004 and 2012. We can see that from 2004 to 2010, the behavior of this index was constant, with a value approx. of 0.5. However, in 2012 we can see that Italy had an improvement of this index with an index of 0.6697.

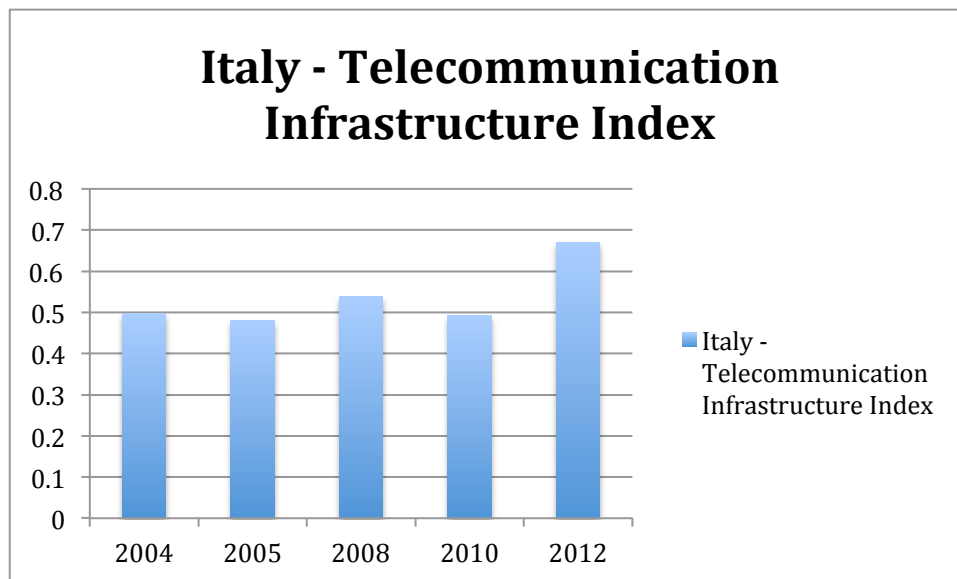


Figure 20. Telecommunication Infrastructure Index of Italy 2004-2012. (UNPAN, 2005) (UNPAN, 2008) (UNPAN, 2010) (UNPAN, 2012)

Table 32 presents the value of the five sub-indexes included in the Telecommunication Infrastructure Index. We compare the values in the range 2008 - 2012. We can see in Table 32 that the few changes in these years are related with the number of Internet Users with a rise from 50 to 54 users and the number of Mobile Subscribers with an increase of 123 to 135 subscribers. The increase is very low; this shows that in Italy the use of telecommunication technologies has not been well received.

Year	Estimated Internet users per 100 inhabitants	Main fixed telephone lines per 100 inhabitants	Mobile subscribers per 100 inhabitants	Personal computers per 100 inhabitants	Fixed Internet subscriptions per 100 inhabitants	Total fixed broadband per 100 inhabitants	Index value
2008	49.63	43.12	123.08	36.99		14.86	0.5389
2010	48.85	33.61	148.61	36.64		18.93	0.4914
2012	53.68	35.67	135.42		34.23	22.13	0.6697

Table 32. Sub-indexes of Telecommunication Infrastructure Index of Italy in 2008, 2010 and 2012. (UNPAN, 2008) (UNPAN, 2010) (UNPAN, 2012)

Table 33 shows a comparison of the Telecommunication Infrastructure Index between the leading countries in the world and the position of Italy. Not much information is available to the best of our knowledge about the rankings in different years; we found this data for 2010 and 2012. Comparing these two rankings, we can see that there is an improvement of the telecommunication infrastructure index. Therefore, the position of Italy in the ranking also improves. Italy was in the 32th place in 2010 and in 2012 it was in 28th place.

Year	Rank	Country	Index Value
2010	1	Switzerland	0.7687
	2	Netherlands	0.7666
	3	Sweden	0.7522
	32	Italy	0.51
2012	1	Liechtenstein	1
	2	Monaco	0.937
	3	Switzerland	0.8782
	28	Italy	0.6697

Table 33. Comparison of Leading Countries and Italy in the Telecommunication Infrastructure Index. (UNPAN, 2010) (UNPAN, 2012)

- **PEST Analysis**

As was described in Chapter 3 the PEST Analysis will be useful in order to understand different factors that can influence the development of BLL, taking into account the Political, Economical, Social and Technological dimensions. In this section the key facts that are characteristics and more relevant of each dimension of the PEST Analysis in Italy are explained.

○ **Political Analysis**

During these years 2006 to 2012, Italy started living a period of instability due to the recession in the Italian economy. The European debt crisis constituted a crucial event with important economic and political consequences, notably for southern European states. In 2011, Italy changed its government, before the natural end of the legislature. This premise demonstrates that the instability of the government during these years.

○ **Economical Analysis**

In this section will be described the economic behavior of Italy. The Italian economy has remained one of the poor performers in the Eurozone. Irrespective of cyclical fluctuations, the Italian economy has been registering a low output growth due to its structural problems. The economy grew at a CAGR (Compound annual growth rate) of 1.1% during 2000-06, and the global economic slowdown further dampened economic recovery. In 2006 the economy showed some signs of recovery by growing at a rate of 2%, but slid back to 1.5% in 2007. During the first nine months of 2007 there was a modest upturn, but growth in the industrial and service sectors declined in the last quarter. There was an increase in unit labor cost and in bank debt, particularly among small and medium enterprises. The country entered recession in 2008 when the economy contracted by 1.3%, which continued in 2009 with a contraction of 5.2%. However, the economy bounced back to a growth of 1.3% in 2010. (MarketLine, 2011)

The Key indicators during 2005 to 2011 are (Table 34):

Data	2005	2008	2009	2011
Population (millions)	58.1	58.9	59.9	64.5
GDP (US\$ billions)	1,766.2	2,313.9	2,118.3	2,198.7
GDP per capita (US\$)	2.73	38,996.2	35,435	36,267
GDP (PPP) as share (%) of world total	28,760	2.64	2.51	2.34

Table 34. Key Indicator of Italy 2005-2011. Source: The World Economic Forum. (2005 - 2011).

○ **Social Analysis**

The Social analysis is related to the cultural factors such as the education level, income and unemployment information.

- The Level of education in Italy is improving in recent years but Italy's level of education is still worse than the European averages. In fact, people aged 30-34 years with a university degree are 20.3% of the whole active population in Italy and 34.6% in Europe. In addition, the gap between Northern and Southern Italy is very pronounced (youths neither studying nor working: 15.4% north, 31.9% south). (ISTAT and Cnel, 2013).
- 47% of people consider their income insufficient. The savings rate has decreased of about 8% during the considered period Only 0.07% of the

population earn more than 300,000 € per year, only 1% earn more than 100,000€ while more than a third earn less than 10,000€ with obvious difficulties⁸.

- The unemployment rate in 2006 - 2012 has been increasing. This problem is particularly visible in the poorest regions of Italy. One of the reasons is the discouragement of finding a job in these regions (Figure 21).



Figure 21. Italy Unemployment rate. Source: Trading Economics⁹.

○ Technological Analysis

The technological analysis allows understanding how much the Italy's government invests in R&D in the country. The data related with R&D during 2005 to 2010 are presented in the Figure 22. We can see that there was an increase in the investment of the GDP in R&D during these years. However, these percentages are low in comparison with the investment of other countries.

⁸ <http://www.mef.gov.it/>

⁹ <http://www.tradingeconomics.com/italy/unemployment-rate>

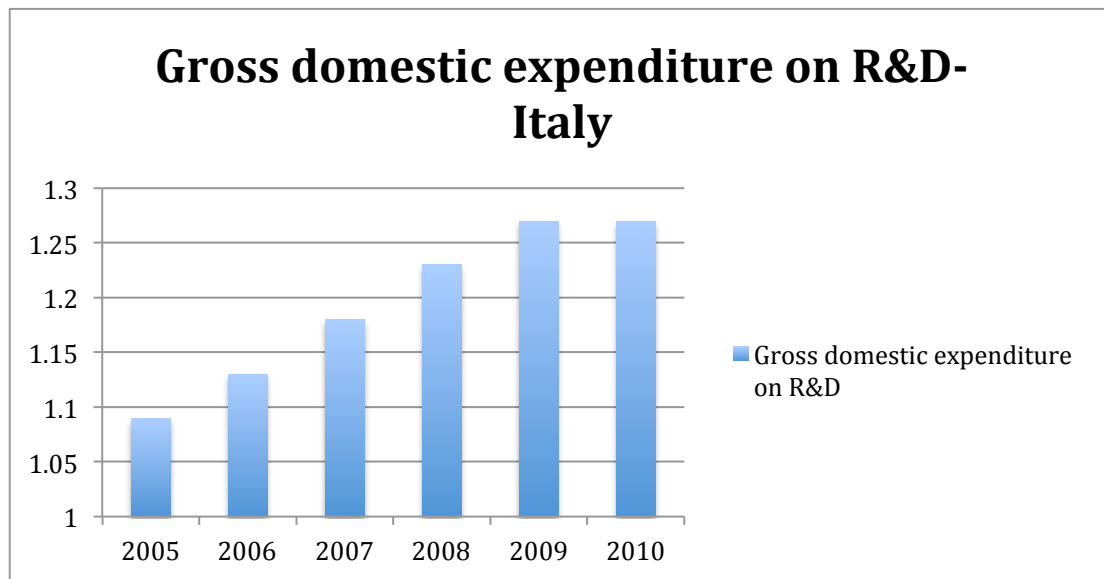


Figure 22. Gross domestic expenditure on R&D in Italy. (OECD Factbook, 2011)

4.2.3 Analysis of Stakeholders

The analysis of Stakeholder in our model is performed taking into account the data in Italy and the data in Lombardia according to the availability of information. The sources of our analysis are reported in detail in each category of Stakeholder in what follows.

- **Citizens**

The citizens will be evaluated using the Human Capital Index (As was explained in the description of our model). This data is going to be taken from the reports of United Nations. (UNPAN, 2005) (UNPAN, 2008) (UNPAN, 2010) (UNPAN, 2012).

In Figure 23, we can see the value of the Human Capital Index of Italy from 2004 to 2012. At the beginning, there was no change in 2004 and 2005 with an index of 0.93. Then, in 2008 and 2010, Italy had a constant increase achieving in 2010 an index of 0.9683. After that, in 2012 we can see that Italy had an enormously decrease. The index declined to 0.912. It was the smallest value that Italy had had during these eight years.

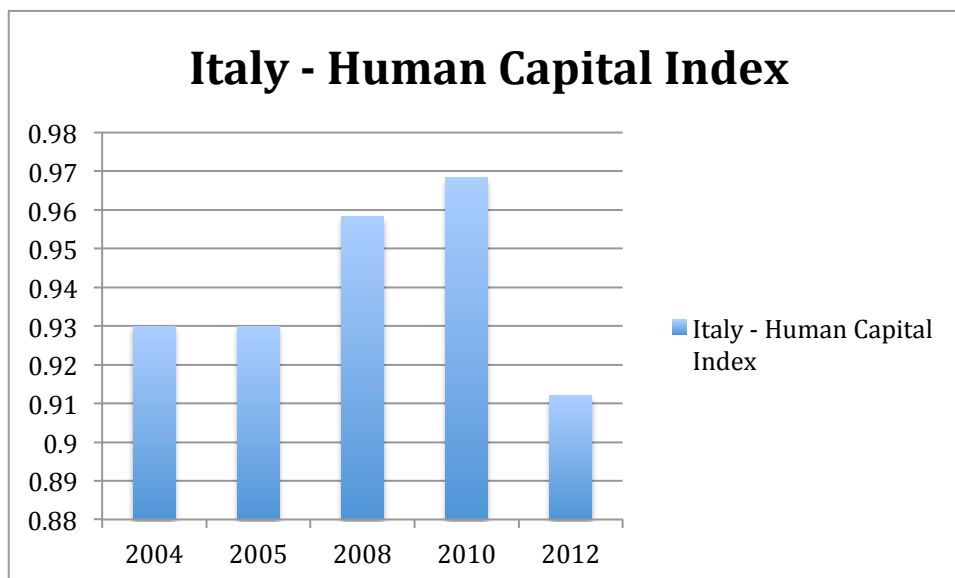


Figure 23. Human Capital Index of Italy 2004-2012. (UNPAN, 2005) (UNPAN, 2008) (UNPAN, 2010) (UNPAN, 2012).

To understand the behavior of this index during 2008 to 2012, the Table 35 shows the values of the sub-indexes used to calculate the Human Capital Index. We can see that the values of Adult Literacy and Enrollment don't change too much between the years. This means that the variance in the indexes is based on the difference of values with the country with the highest index and the country with the lowest value used in the report of United Nations.

Year	Adult Literacy (%)	Enrollment(%)	Human Capital index
2008	98.4	90.639	0.9582
2010	98.9	92.71	0.9683
2012	98.87	91.82	0.912

Table 35. Sub-indexes of Human Capital Index of Italy in 2008, 2010 and 2012. (UNPAN, 2008) (UNPAN, 2010) (UNPAN, 2012).

Table 36 presents a comparison of the Human Capital Index between the leading countries in the world during 2010 and 2012 with the position of Italy in the same years. In the table, we can see that the highest index in 2012 increased, achieving the maximum value 1. Therefore, Italy dropped from the third place to the 21st stand to the 24th.

Year	Rank	Country	Index Value
2010	1	Cuba	0.9987
	2	Australia	0.9933
	3	Denmark	0.9933
	21	Italy	0.9683

2012	1	Australia	1
	2	New Zealand	0.9982
	3	Cuba	0.9684
	26	Italy	0.912

Table 36. Comparison of Leading Countries and Italy in the Human Capital Index. (UNPAN, 2010) (UNPAN, 2012).

- **Employees and Job Seekers**

The next tables are the statistics taken from IStat¹⁰. The first two tables are the Number of Employed (Table 37) and Unemployed people (Table 38) in Lombardia between 2007 to 2011, taking into consideration the different level of Education: Pre-Primary and Primary, Lower Secondary, Upper and Post Secondary, Tertiary (University, Doctoral and Specialization Courses). The final table (Table 39) is the number of people graduated in a university in 2007 and 2008. No data are available between 2009 and 2011.

Table 37 shows Number of Employed People taking into account the Italian and Foreign citizens, people working in all the industries as an employee and independent, in full and part time with permanent and temporary contract.

			Data type				
			Number of Employed People 15 years and more				
			Time and frequency				
			2007	2008	2009	2010	2011
Territory	Education Level	Gender					
Lombardy	Pre-Primary And Primary	Males	168	158	139	134	126
		Females	78	72	61	56	54
		Total	246	230	200	190	180
	Lower Secondary	Males	905	899	889	864	870
		Females	474	471	472	450	427
		Total	1378	1370	1361	1314	1297
	Upper and Post Secondary	Males	1096	1104	1098	1109	1101
		Females	897	892	884	895	913
		Total	1993	1996	1983	2003	2014
	Tertiary	Males	353	379	378	370	387
		Females	335	376	378	397	395
		Total	688	755	756	766	782
	Total	Males	2522	2540	2504	2476	2484
		Females	1784	1811	1796	1797	1789
		Total	4305	4351	4300	4273	4273
Data Extracted on 13 Feb 2014 18:23 UTC (GMT) from I.Stat							

Table 37. Number of Employed People by level of education attained. (IStat)

¹⁰ <http://www.istat.it/en/>

Table 38 presents the Number of Unemployed People. This data takes into account the Italian and Foreign citizens, with unemployment of more than 12 months and is considered the people without experience, ex-employed and ex-inactive.

Data type		Number of Unemployed People 15 years and more					
Time and frequency		2007	2008	2009	2010	2011	
Territory	Education Level						
Lombardia	Pre-Primary And Primary	12	15	20	19	21	
	Low Secondary	64	72	92	96	102	
	Upper and Post Secondary	59	62	104	110	107	
	Tertiary	17	20	28	30	31	
	Total	Males	68	77	121	128	133
		Females	85	91	123	126	128
Total		153	168	244	253	261	

Data Extracted on 13 Feb 2014 18:23 UTC (GMT) from I.Stat

Table 38. Number of Unemployed People by level of education attained. (I.Stat)

Table 39 shows the Number of Graduated People with University Education taking into account public and private universities and all the field of studies, as proposed by ISTAT.

Data type		Graduated People with University Education			
Time and frequency		Graduates		Graduates who have not completed their exams	
Year of reference		2007	2008	2007	2008
Territory	Gender				
Lombardia	Males	20660	20582	9753	9668
	Females	25890	25999	10251	10230
	Total	46550	46581	20004	19898

Data extracted on 13 Feb 2014 18:23 UTC (GMT) from I.Stat

Table 39. Graduated People with University Education. (I.Stat)

- **Companies**

Based on the data of BLL System, the Table 40 shows that at the end of March 2005 the number of companies registered in BLL is 2000. During the first year of BLL life, the number of registered companies has increased considerably. (Buonanno and Gaj, 2005).

Number of Companies Registered*	
Pre-Launch	356
March 2004	510
April	765
May	927
June	1006
July	1066
August	1105
September	1260
October	1355
November	1458
December	1533
January 2005	1610
February	1752
March	2031
*Values are cumulative	

Table 40. Number of Companies Registered. Source: Buonanno and Gaj, 2005.

In Table 41, one can notice that more than 40% jobs are in services to businesses and individuals; still a significant proportion (35.3%) is in industry and 20.4% in commerce, tourism and transportation (Buonanno and Gaj, 2005).

Distribution of Companies by Sector (31/03/2005)	
Industry	35,3
Construction	4,2
Commerce, Tourism and Transport	20,4
Services to businesses and individuals	40,1
Total	100,0

Table 41. Distribution of Companies by Sector. Source: Buonanno and Gaj, 2005.

Table 42 shows that the majority of businesses that use BLL are those of small dimensions between 1 and 9 employees. If we add the 16.6% of firms between 10 and 49 employees, we have that over 60% of companies registered at BLL are small-size companies. Only 20.6% of registered companies are medium size, and 17.9% are large size companies (Buonanno and Gaj, 2005).

Distribution of Companies by Size (31/03/2005)	
1-9 employees	44,9
10-49 employees	16,6
50-249 employees	20,6
More than 250 employees	17,9
Total	100,0

Table 42. Distribution of Companies by Size. Source: Buonanno and Gaj, 2005.

- **Educational Institutes**

Among the services offered by BLL, there are services related to educational training and training opportunities with the aim to improve the probabilities of citizens to get a job. There are not data available in order to identify the number of courses offered and/or the number of benefits.

- **Competitors**

The most important competitors with similar services to BLL are Cliclavoro and InfoJobs. InfoJobs was already explained in the case study of SOC.

Cliclavoro is the main competitor of BLL. It is a portal launched by the Italian Ministry of Labor and Social Policy in 2010, as a broker between job supply and demand and to connect the systems formed by businesses, educational / training bodies and social policy. The main purpose of the portal is to ensure easy and direct access to a complete and detailed catalogue of information and services relating to employment, through a shared and cooperative IT system.

- **Public/Private Administration**

BLL offers a network of information points distributed in many cities of Lombardy in order to reach the greatest number of citizens and companies. There are about 215 points of contact that are housed in the offices of several organizations, municipalities, associations and employers' associations, trade unions and in the offices of the Region Area (Giupponi, 2006).

4.2.4 Analysis of BLL's System

In this part we present the evaluation of BLL's system, based on the model developed in Chapter 3.

4.2.4.1 Strategic Dimension

This dimension is divided in three main components:

Objectives

BLL is intended to promote an increasingly close cooperation between workers, employers and the different actors in the labor market, not only public but also private. Integration also, as it intends to consider the system of education and training system as closely related to the working environment, and therefore as opportunities for workers and businesses to bridge the gap that may exist between the specific skills and market demands. The information is the second cornerstone of the model; providing the basis for an increase in the effectiveness of labor market policies, keeping the latest information on legislation, training opportunities, job opportunities and education, as well as detailed data on market.

Risk Management

As explained in SOC's case, to provide a complete risk analysis of the system is necessary to develop a series of studies and access to a lot of information that unfortunately is impossible for us to get. So, also in this case the Risk Management Plan is the best methodology to follow and apply, to obtain the most accurate list of risks affecting the system, along with their probabilities and impact level.

Future Development Plans

In 2005, the projections for BLL were to keep the commitment for the future and to continue on the path of the consolidation and improvement, creating an even more marked integration among public and private entities and between the systems of training, education and work. The main objectives proposed were:

- Development of cooperation with the National Stock Exchange and other regional nodes for the completion and full operation of the network on the whole Italian territory.
- At local level, the achievement of full interoperability between Borsa Lavoro Lombardia and Sintesi, the service that provides on-line data collected from provincial employment centers in the region.
- Development of a system for monitoring the flow of data to support from training, territorial and socio-economic activities; to activities of monitoring and improvement service delivery for the job, to the activities of the cultural and social investment.
- Enhancement of the educational offer available to the citizen.
- Strengthening the integration with the channels of mass communication to a widespread distribution among users and operators (Digital TV, mobile phones, video systems).

4.2.4.2 Economic and Financial

For the evaluation of this section, it was not possible to find any data of BLL's economic and financial investments.

4.2.4.3 Organizational and Technological Dimension

BLL is divided in different channels for users to access to services, employers and job searchers can interact using the Internet Portal, the call-center and the offices network.

The main tool for citizens and companies is the Internet Portal, where they can find all the services provided by BLL, along with statistical data. Table 43 summarizes the main services offered by BLL to workers and employers.

Workers	Employers
1. Post offers (CV)	1. Insert requests
2. Queries to the system	2. Queries to the system
3. Search for posted requests	3. Seeking offers
4. Search for matching offer with requests	4. Search for matching
5. Display search results	5. Display search results

6. See matching results	6. See matching results
7. Select requests	7. Select offers
8. Send request contact	8. Send request contact
9. Receive contact request	9. Receive contact request
10. Contact agencies	10. Contact agencies
11. Contact companies	11. Contact person
12. Notify events	12. Notify events

Table 43. Services available per users in BLL. Source: Buonanno and Gaj.

Table 44 shows the number of visits; new users and recurrent users between march 31, 2004 and march 31, 2005.

	Hits	Pages visited	Login	Sign Up
March	32,738	690,495	11,439	3,730
April	73,876	1,105,522	26,244	5,918
May	41,968	603,269	17,294	7,063
June	26,082	317,625	9,242	3,669
July	19,102	219,392	6,909	2,094
August	20,209	268,263	5,145	1,340
September	37,696	243,303	11,115	1,359
October	35,963	242,358	10,261	2,824
November	47,847	376,814	13,089	2,390
December	36,984	351,697	9,941	3,613
January	63,932	521,802	13,256	2,160
February	109,048	730,865	19,131	3,794
March	112,785	738,310	20,469	4,654
Total	658,230	6,409,715	173,535	44,608

Table 44. Hits, pages visited, and log records. Monthly time series. Source: Buonanno and Gaj.

Along with the number of visits and users in the portal, there are also other important figures about BLL in 2005:

- The site has received 1,910,266 visits (with an average of 2,440 unique users per day).
- The pages have been viewed 16,889,435 (with an average of 21,570 per day).
- There are 102,616 citizens registered.
- 3,274 businesses have been registered.
- The public and private operators are 310.
- The database of borsalavorolombardia.net had an offer of 11,062 jobs available and 9,134 active candidates.

4.2.4.4 Services Provision Dimension

The services provided by BLL can be classified into two main categories: *information services* and *interactive services*.

Regarding information services, mostly of them do not require user registration, and are accessible using an anonymous user. The objective of these services, is to provide useful and guidance information to help citizens. The information services, which can be freely consulted, are:

1. Search information on available jobs: the information that the system provides, are the job offers available aggregated by profession and Province of the workplace.
2. Search for information on certain professions: the portal provides information such as the description of the profession, offers found next to and employment prospects.
3. Professions more requested: this is a feature that offers the user a list of the twenty most required professions in BLL. In this section, in addition to information about the profession is also possible to find any training proposals related to it.

Interactive services are accessible only by registered users. These include:

1. Enablement services (for brokers and employment agencies): aggregate functions that allow the actors of the labor market, other than workers or employers, to operate in an integrated way within the system.
2. Reception services (for workers and employers): is a registration process where the employee should fill a form with his information. The data inserted includes: personal data, curriculum and the profile of the professional activity desired.

Some statistics about the information registered between March 2004 and March 2005, using BLL' services are presented in Table 45 and Table 46.

	Recordings				
	By entities	By employment centers	Citizens	Companies	Operators
Pre-Launch	154	3,272	3,324	356	50
March which year?	155	3,272	9,083	510	55
April	187	3,273	15,876	765	70
May	188	3,273	19,377	927	76
June	211	5,981	21,386	1,006	82
July	216	5,981	22,658	1,066	90
August	216	5,981	23,975	1,105	93
September	218	5,981	26,643	1,260	94
October	222	5,981	28,935	1,355	97
November	228	6,046	32,441	1,458	101
December	351	6,046	34,525	1,533	102
January	353	6,047	38,239	1,610	105

February	354	6,047	42,744	1,752	112
March	354	6,047	46,835	2,032	115
Total	3,407	73,228	366,041	16,735	1,242

Table 45. Recordings made for type of user. Source: Buonanno and Gaj.

	Sign Up			Total CV			Active CV		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<18	24	27	51	9	10	19	3	4	7
18-25	4,510	5,406	9,916	2,079	2,095	4,174	575	608	1,183
27-35	11,518	11,192	22,710	5,414	4,416	9,830	1,434	1,110	2,544
36-50	7,033	4,812	11,845	3,357	1,960	5,317	975	562	1,537
>50	1,706	598	2,304	714	229	943	176	43	219
Total	24,791	22,035	46,826	11,573	8,710	20,283	3,163	2,327	5,490

Table 46. Registered citizens by sex and age. Source: Buonanno and Gaj (2005).

4.2.4.5 Social Outcomes

BLL is a tool created, not just to work as a connection between workers and companies, but also as an instrument to improve the chances of citizens to get a job through different services and initiatives. Some of these programs and partnerships are:

- **Training and Education area**

This section covers all the information related to training courses offered by the different organizations, public and private, associated with BLL. Given that the system was designed for Lombardy region, the training offers correspond only with courses inside the region.

Some of the organizations working in this area are:

- Universities and university foundations or institutions.
- Secondary schools.
- Municipalities.
- Chambers of commerce.
- Associations of employers and labor providers.
- Associations oriented at protecting employment and business development.
- Other government or locally organizations.

- **The “Formalavoro Magazine”**

BLL has created the on-line magazine “Formalavoro”, where users can find information about the current situation of employment and training, based

on interviews, researches and comments. This publication can be accessed freely.

- **Social cooperatives for the employment of disabled workers**

These organizations have a distinct role within the labor market, as means for companies to hire disabled workers and thereby fulfill this obligation. One of BLL's plans was to develop a special feature for this particular sector of the labor market.

An important feature of BLL is that the web portal has been developed using distributed databases, making the system available from different nodes, which is useful to find updated information related to legislation, training, education and employment through the whole EU network.

But the interoperability of BLL has then been extended to European partners besides being interconnected with the different regional databases across the entire country. This feature would facilitate the mobility of workers, fulfilling the offers and requests posted.

4.2.4.6 Political and Democratic

In this dimension, BLL provides some informative services, where users can find terminology and legislation related to the employment market, and also there is a community module where users can participate with opinions, questions and requests.

Unfortunately, the web site does not provide any information or documents related to annual reports or financial statements. Also, the statistics published on the page are very limited, showing only four variables: classifieds, jobs, candidates and records.

5 ANALYSIS OF RESULTS

Taking into account the results regarding the two systems (SOC and BLL), the outcomes are presented as a comparison between these two systems using the selected indicators. Notice that the analysis of results will be centered on interpreting the information obtained for each system based on its environment and its stakeholders, understanding the behaviors that we consider could influence in the development of each system. The expected outcome of this analysis is indeed the final determination of why an information system performed better than the other, if this is the case.

5.1 COMPARISON OF THE ANALYSIS OF ENVIRONMENT

Based on the information taken from 2005 to 2012 approx., which is related to the countries and regions where each system is operating, we want to underline that:

- The *Telecommunication Infrastructure Index* of Spain and Italy during these years had similar values. There was no great difference on the final ranking. Therefore, this item is not a comparison point between the case studies because there is no difference in the operations of each system.
- Analyzing the *Political and Economical Aspects* in the two countries, we can see that both countries were affected by the economic recession. However, Spain quickly proposed a cross-party support to revive its stumbling economy with different measures and fiscal stimulus, which served as support for companies and citizens in Spain. While the Italian Government was slow to act in terms of combating the effects of the crisis, therefore, the companies and Italian citizens were more affected.
- In Figure 24, we can observe that the *Unemployment rate* during 2005 to 2012 between Italy and Spain is very similar with a same behavior; an increase in both countries is evident.

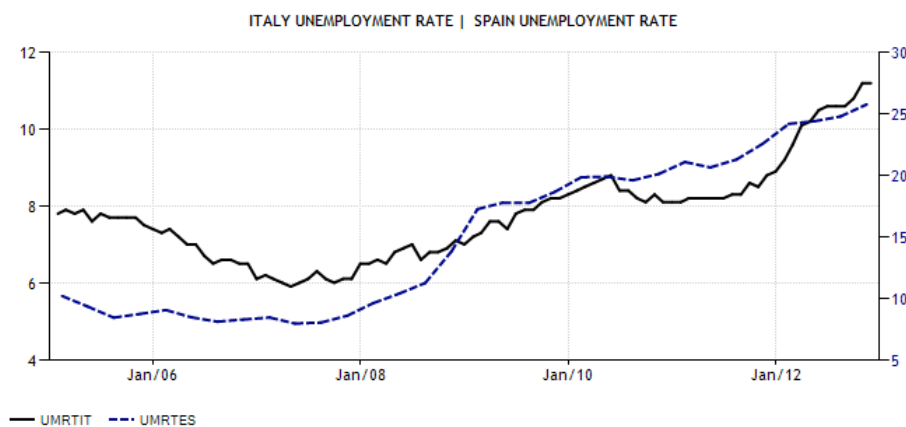


Figure 24. Unemployment Rate: Italy and Spain. Source: The World Economic Forum. (2005 - 2011).

- Based on the *Investment on Technology* taking into account the Gross domestic expenditure on R&D as a percentage of GDP, we see that Spain and Italy invested a similar percentage of GDP during these years, between 1.1% and 1.38%.

This analysis shows that both countries have similarities not only in the political point of view but also in the economical and technological aspects. From this point, we have that the two countries (Spain and Italy) were in the same conditions at the time of launch the EIS.

5.2 COMPARISON OF THE ANALYSIS OF STAKEHOLDERS

Considering the stakeholders of BLL and SOC based on the information taken from 2005 to 2012 approx. The most useful findings are:

- Comparing the Human Capital Index of Spain and Italy, it is observed that during 2008 - 2012, Spain always showed a superiority level in this index. Spain was between positions 9 to 12 while Italy was between 21 and 26. This difference is important to be taken into account in our analysis because this index shows the level of education and skills of a country. Therefore, with this information, we can conclude that Spain's citizens are more likely to have larger access to ICTs and also are likely to embrace ICTs quickly and more efficiently.
- Taking into account the statistics taken from Lombardia and Catalonia, we can say that Italy presented a better behavior in the labor market because Italy had more employed people and less unemployed people during 2007 to 2011. The number of employed people in Lombardia was 21502 and in Catalonia were 16349 and the number of unemployed people in Lombardia was 1079 and in Catalonia were 2479. We can notice that Lombardia had more unemployed people than employed, which is a premise to derive one of the reasons that people started using SOC. Therefore, this guarantees why SOC had a better reception from Spain's citizens, than BLL in Italy.
- About the number of people graduated, we have information of 2008, where Lombardia (Italy) had a higher number of people graduated of a university than Catalonia (Spain). Lombardia with 46581 graduated people and Catalonia with 26823.
- Based on the information available about the number of Companies registered in the systems (BLL and SOC), we have that:
 - Number of companies registered in BLL at 2005: 2031
 - Number of companies registered in SOC at 2010: 3060
 - Number of companies that published offers in SOC at 2010: 1242
 - % Of companies that have published offers over the total of companies activated in SOC: 40.6%

Although, the data available is not in the same period, we can deduce that at 2005, BLL had more companies registered than SOC. This would imply that the Italia citizens had a more amount of job offers

- The information about training programs offered by BLL is very poor; the number of offered programs is few. However, the data related to SOC was very useful. SOC offers a lot of programs of training in different fields. During 2007 to 2011 were benefited more than 432418 people. This guarantees that Spain's citizens had more opportunities to enter in the labor market, due to they were more prepared and trained in different sectors even when they didn't have a university degree.
- There were more offices of BLL available in Lombardia (215 Points of contact) that those offices of SOC in Catalonia (70 public offices). This implies that the accessibility to the system in Italy was easier. In spite of this, Italian citizens didn't take advantages of these services. While Spain with just 70 offices distributed throughout Catalonia, benefited more citizens.

5.3 COMPARISON OF THE ANALYSIS OF SOC AND BLL SYSTEMS

In this section we compare the results obtained during the evaluation of the EISs developed by Catalonia and Lombardy, exposing the differences and similarities between them, in order to explain the success or failure of each one.

5.3.1 Strategic

This dimension evaluates the definition of goals, the evaluation of risk and the plans for future developments and improvements. The results for this section for both systems were:

Objectives

SOC and BLL had defined their own objectives, based on internal policies of their regions and countries, and also on the policies established by EU in terms of employment.

In the case of SOC, it was possible to evaluate the initial objectives and the completion of those goals every year since its inception until now, thanks to the publication of an annual report, where it is possible to observe the evolution and the development of the system.

For BLL, the assessment was more difficult to perform, but it was possible to identify the initial goals defined for the system.

In this point, both systems are similar because both of them have defined clearly the goals that they want to achieve with the implementation of an EIS.

Risk Management

The process to develop an accurate measure of the risk associated to both systems was not possible to execute, because there is not enough information to run a complete risk analysis, for this reason a comparison on this item it is not feasible.

Future Development Plans

In the documentation provided by SOC it was possible to observe the evolution of the system, how SOC has adapted its programs to provide better results, to help its users to find jobs and to be prepared to fulfill the requirements of employers.

For BLL, it was possible to find the future plans proposed at the beginning of the project, along with strategies that were planned to improve the services implemented in order to reach the goals initially projected.

In this point, SOC has an advantage over BLL, given that with the annual reports published by the system, it is possible to follow its evolution and monitor which of the proposed plans were implemented successfully.

5.3.2 Economic and Financial

In the economic and financial dimension, SOC's data showed how the initial budget was growing every year to cover the needs of the system, trying to correct the misalignment among debt and funds. Even when the system has been showing good results supporting the match between job seekers and job offers, the economic results have been not good enough, leading to look for alternative solutions, one of which is the possibility to give SOC to private agencies, in order to keep it working and avoid the rising economical problems.

The comparison with BLL for this item could not be performed, and we could only observe the economical and financial behavior of SOC.

5.3.3 Organizational and Technological

For this dimension, it is possible to compare the numbers between SOC and BLL in their first year of operation.

Table 47 presents statistics about the number of new users registered in each system, the offers available and the companies signed up, in 2005.

	SOC	BLL
Users registered	177,900	102,616
Job offers	43,712	11,062
Business registered	1,526	3,274

Table 47. SOC's and BLL's offers and users registered in their first year

This data shows that SOC had a better performance related to the number of users subscribed and offers upload to the system, beating BLL for 42% and 75% respectively. This results show a tendency of better growing for SOC, that could be

confirm with the information of subsequent years, but in BLL's case, data shows how the use of the tool has decreased yearly, reaching a reduction in more than 96% in the number of job offers posted in the system.

Regarding to the automation of processes, both systems have developed an EIS that covers the most used procedures, opening a new alternative for users that cannot go to the physical offices. Additionally, SOC has also created different programs to offer training and support to users without technological skills, in order to help them in the learning and adaptation process.

5.3.4 Services Provision

SOC and BLL provide all their employment services through offices and online processes, covering activities as: registration, searching of offers and people with specific skills, information about the main professions required and some reports and annual statistics.

In this dimension the main difference between SOC and BLL is that, in addition to the traditional employment services, SOC has also integrated a network of training to support jobseekers, giving the possibility to citizens to improve their skills and enlarge the range of offers to which they can apply.

BLL is more focused in set up stations in schools to facilitate the access to the system for students, but the offer related to education or training programs is low compared with SOC.

5.3.5 Social Outcomes

In this dimension the two EISs are similar, offering programs related to the improvement of knowledge and skills of citizens, supporting the job search for all users, creating special programs for disabled people and minorities.

The main programs implemented are related to: Guidance Services, Training, Equal Employment Services and Innovative Communication Means with users.

One remarkable point is that in BLL's case, the system has been developed using distributed databases, which facilitates the interaction of the system with others EISs, not only in the country but also around EU, and enlarge the number of offers and requests for citizens and companies. This service increases the mobility and interchange of workers and knowledge.

5.3.6 Political and Democratic

In this dimension, SOC has a significant advantage over BLL related to the openness and availability of data for users. SOC provides reports and documents with all the information about the EIS, reporting data with the number of users subscribed, the offers uploaded and available, investments, plans and achievements.

In the case of BLL, the information available was provided by some studies and researches developed by people outside the organization. Moreover, the BLL website has published some documents related to terminology and legislation.

Users of SOC and BLL, have the possibility to express doubts, inconformity or to ask for help, using different tools such as forums and community modules, which creates a more interactive and inclusive environment.

5.4 DISCUSSION

The information collected confirms how the use of BLL decreased yearly, reaching a reduction in more than 96% in the number of job offers posted in the system, while SOC always presented a higher number of users subscribed and offers upload to the system.

In order to find possible reasons explaining this difference in performance, we compare BLL and SOC using the model developed in Chapter 3, finding that Catalonia and Lombardia are very similar regions from the economic and infrastructure point of view. However, we can see a big difference in the cultural aspect taking into account that even when there were offering more accesses in Lombardia to BLL and there were more companies subscribed and a larger number of job offers, the use of BLL was lower in Lombardia than SOC in Catalonia.

Additionally, SOC proposed more trainings programs to citizens than BLL. These training services offered by SOC helped to Spain's job seekers to improve their professional skills, making them more suitable to the labor market needs and hence increase their chances of getting a job. Among the training programs, SOC offered services to people of different age and different field. Therefore SOC knew how to reach out to more people.

In the case of BLL, they didn't promote the system and its services; therefore the citizens are not aware about the advantages of this tool. Although, BLL had been developed using an architecture of distributed databases, which facilitates the interaction of the system with others EISs, increasing the mobility and interchange of workers and knowledge, Italians didn't take advantage of its services, due to the system was unknown and people were not trained in how to use it. Therefore, the final citizens' perception was that the system was very complex to use.

Along with the complexity of BLL for users, one important point that could affect the perception of the citizens was the openness and transparency of the system, given that the information provided by the official web page or governmental sites is limited and not user-friendly. BLL doesn't have an online support, like chat or forums, and users should look for help in the main office or write an email, losing the advantages of virtual interaction.

Even if BLL was developed using an advanced technology and a complex architecture, there was a lack of planning related to the structure used to build an

effective system in an E-Government environment. It is possible that the system was created for a more mature context and this affected its compatibility, and users were unprepared to this kind of change.

The introduction of citizens and entities to an E-Government environment should be developed gradually, to permit a correct adaptation and avoid aversion to new tools. Training and support should be the main characteristic of the programs related to technological changes, giving the opportunity to people, users and operators, to familiarize with the system and foster it in a more smooth way.

6 CONCLUSIONS

This research was carried out in response to a need for develop better measures to evaluate information systems in the area of public services. Based on a combination of proposals from different authors analyzed in the literature review, we proposed and validated an evaluation model for EIS, which integrates three main different analyses: Environment, Stakeholders and Internal analysis of the EIS.

The developed framework was applied to two EIS, SOC and BLL, targeted to specific regions, Lombardia in Italy and Catalonia in Spain. The findings obtained from these case studies provide important implications for IS assessment. First, we confirm that the three proposed analysis of our model capture a picture of the general context in which the EIS studied operates. The information about the context constitutes an important input to better interpret the operations of an EIS, in order to characterize the level of development in E-Government based on External and Internal information. In addition, one more finding to highlight is that with this model, the EIS can be described with qualitative and quantitative data in different domains: local, regional and national level. This combination of methods guarantees a better understanding of the behavior of an EIS, because the framework not only allows measure different events but also provides insights of the setting of the system, generating ideas and/or hypotheses about the factors that affects or benefits the EIS. Further, as a additional outcome, we consider that even though this model was based on EIS, which is specifically developed under the G2C context, our model can be applied on the different categories of E-Government, G2B and G2G, due to in all cases an analysis of Environment and external aspects would be needed, and the Stakeholder analysis will be useful to evaluate the different participants interacting with the system.

However, the model also presents several limitations, which could be addressed in future researches. First, as we said our model allows carry out a qualitative analysis, thus, this analysis depends on criteria of the analyst that may create subjective evaluation bias. Therefore, in order to reduce the uncertainty that this subjectivity can generate to the results, it is strongly recommended that the analyst must to develop a deep research about the external environment, stakeholders and the EIS, and thus to have a high degree of knowledge about the system in all terms. In addition, it is also recommended doing the analysis as a method of comparison, because this allows understanding better the data obtained. In case of just one EIS, the information tends to be more subjective for the analyst. Nevertheless, these limitations also indicate which could be the next step to develop in future researches.

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