

# Castile and Leon, a model of interoperability.

**Isabel Alonso Sánchez**

Consejera de Administración Autonómica, JCYL.  
Valladolid, Castilla y León, España.  
alosanis@jcy.es

**Antonio Francisco Pérez Fernández.**

D.G. de Innovación y Modernización Administrativa, JCYL.  
Valladolid, Castilla y León, España.  
perferan@jcy.es

**José Ignacio de Uribe Ladrón de Cegama.**

D.G. de Innovación y Modernización Administrativa, JCYL.  
Valladolid, Castilla y León, España.  
uriladjo@jcy.es

**Jorge Ordás Alonso.**

D.G. de Innovación y Modernización Administrativa, JCYL.  
Valladolid, Castilla y León, España.  
ordalojo@jcy.es

## Abstract

*The Castile and Leon Government (JCYL), in its tireless efforts to modernise the Administration, presents in this document a view of innovation and support to the introduction of a complete framework of interoperability within its territory. It also takes into account the enlargement of such framework with the aim of being part of a superior model of interoperability of a national, European and international nature. This will allow it to achieve a full administrative interrelation as the only way to reach the modernisation of the European public sector, which will allow to satisfy the needs of citizens and companies alike.*

## Keywords

Interoperabilidad, eGovernment, Junta de Castilla y León, Castile and Leon Government, Regional Strategy for the Digital Information Society of Castile and Leon 2007-2013, Strategic Modernisation Plan for the Public Services of Castile and Leon, SOA, EAI, ESB, UDDI, Web Services, WS-Security.

## REFERENCE BACKGROUND

These last years; interoperability<sup>1</sup>, the main actor in this meeting, has become one of the basis and an essential condition to provide high quality telematic services to citizens and companies.

Next, the reference initiatives to boost e-administration are summarized and, in particular, interoperability depending on the different territorial spaces; European, Spanish and Castile-Leon.

## 1.1 European level

The Decision 2004/387/CE<sup>2</sup> of the European Parliament and of the Council of 21 April 2004 on Interoperable Delivery of Pan-European eGovernment Services to Public Administrations, Business and Citizens (IDABC Programme 2005-2009), states the importance of the interconnection of Europe in order to consolidate its internal market, and highlights electronic communications as a powerful motor for growth, competitiveness and employment inside the European Union. It also shows the necessity of taking the necessary steps to consolidate such a boosting and so contribute to the Lisbon targets.

On the other hand, the European Union has relaunched the Lisbon Strategy and emphasizes the association for the growth and employment through the initiative i2010 – “A European Information Society for growth and employment”<sup>3</sup>. This suggests the creation of a Common Information European Space as one of the three priorities of European policies regarding the Information Society. This document also deals with the four big challenges to tackle for the creation of such space, namely, speed, content richness, interoperability and security. This highlights once again the essential role of the interoperability with regarding the Information Society and the modernisation of the Administrations.

In 2006, the Communication from the Commission to the Council and the European Parliament – “Interoperability

<sup>2</sup> DECISION 2004/387/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 April 2004 on interoperable delivery of pan-European eGovernment services to public administrations, businesses and citizens (IDABC). [http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/oj/2004/L\\_181/L\\_18120040518en00250035.pdf](http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/oj/2004/L_181/L_18120040518en00250035.pdf).

<sup>3</sup> Brussels, 1.6.2005. COM(2005) 229 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS “i2010 – A European Information Society for growth and employment” {SEC(2005) 717}. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0229:FIN:EN:PDF>.

<sup>1</sup> In this document, interoperability is defined as the capacity the computing systems - and therefore, those proceedings they support- have to exchange information and to allow information interchange between them, as states 11/2007 Act, of July 22, for the electronic access of citizens to Public Services. <http://www.boe.es/boe/dias/2007/06/23/pdfs/A27150-27166.pdf>.

for Pan-European eGovernment Services”<sup>4</sup>, shows how the interoperability of e-administration services, based on open standards, has become a transversal task of an essential importance. The Member States are responsible for the interoperability of their own systems, but in spite of this, interoperability at an European level, which is necessary to apply common policies and priorities of the European Union, demands cooperation and coordination; and it is entitled to occupy an outstanding position in the agenda of the European Union, and, specially, between the strategic framework i-2010 and the initiatives and programmes related to it.

## 1.2 Nationwide level (Spain).

In the Spanish territory, the State General Administration has enlarged our legal system regarding citizens electronic access to public services, which is nowadays a granted right, with the development of the 11/2007 Act<sup>5</sup>. This text means a boosting without precedent to modernise and computerise the public services. Its articles provide a great amount of ideas, which give priority to interoperability as a means to achieve those aims that allow the Spanish public services to be part of the Information Society. Thus, it regulates the cooperation principle in the use of electronic means by Public Services with the aim of guaranteeing the interoperability of those systems and solutions adopted; it mentions the necessity of developing a National Interoperability Plan and, it admits the citizens right of no providing any data or document in the hands of the public services. The Fourth Title means a final support to interoperability; it is devoted to the Cooperation between Public Administrations to boost e-administration. Its Article 41 states: “Public Administrations will use Information Technologies to relate with other Administrations and with citizens, applying computer, technological, organizational and security measures to guarantee an appropriate level of technical, semantic and organizational interoperability”.

Within this national scope, the Ingenio 2010<sup>6</sup>, programme was launched in June 2005, its aim is the promotion of technical innovation and of the Information Society, in reply to the relaunched Lisbon Strategy. This programme stems from the strategic R&D&I axes of the National Programme for Reforms designed by the Spanish Government and, one of its three main aims is to reach the European Union average of percentage of GDP assigned to Information and Communication Technologies (ICT). It is based on the Plan Avanza, one of its key axes.

<sup>4</sup> Brussels, 13.2.2006. COM(2006) 45 final. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. “Interoperability for Pan-European eGovernment Services”. <http://europa.eu.int/idabc/servlets/Doc?id=24117>.

<sup>5</sup> 11/2007 Act, of July 22, for the electronic access of citizens to Public Services. <http://www.boe.es/boe/dias/2007/06/23/pdfs/A27150-27166.pdf>.

<sup>6</sup> INGENIO 2010 Programme, <http://www.ingenio2010.es>.

The boosting due to this Plan Avanza<sup>7</sup> allows us to converge on this 7% of the GDP invested in ICT for the year 2010. The aforementioned Plan also gives interoperability its deserved role, with three measures:

- The PIT.02 measure – Planning in advance of the demand of ICT by Public Administrations, whose aim is to take advantage of the potential of public purchases to revitalize the industrial sector invigorating the interchange of experiences between Administrations, and the coordination between the State General Administration and the Autonomous Communities for the development of common services within a common framework of interoperability.
- The AE.10 measure – Common Services Platform, which eases the development of common services for the combined use by Administrations and which guarantees interoperability.
- The AE13 measure – Interoperability: Recommendations and Standards for Public Administrations, whose aim is to design and develop a common administrative architecture programme to guarantee the interoperability of solutions and which will result in a set of recommendations and standards for Public Administrations.

## 1.3 Autonomous Community level (Castile and Leon).

Paying attention to the scope of our responsibility, the Administration of the Autonomous Community of Castile and Leon has also carried out many actions with the aim of modernising the Administration and establishing, based on the interoperability model, all the necessary elements to endow citizens with electronic procedure capabilities with the suitable legal guarantees. In this context, in May 2005 and as a result of the change process the Community of Castile and Leon was undergoing, Decree 40/2005<sup>8</sup> was past, whereby the use of e-administration techniques by the Administration of the Community of Castile and Leon is regulated. It means a final legal step for the implement of the tools included in the e-administration platform of the Castile and Leon Government.

The ICT world evolves, this is a fact, and the Castile and Leon Government has not stayed behind, everyday it tries to take those steps which allow us to reach the aims of the 11/2007 Act. In this sense, two essential initiatives must be highlighted in this process of modernisation we are undertaking: the “Regional Strategy for the Digital Information

<sup>7</sup> Plan AVANZA, <http://www.planavanza.es>.

<sup>8</sup> Decree 40/2005 of May 19, whereby the use of e-administration techniques by the Administration of the Community of Castile and Leon is regulated. [http://boeyl.jcyl.es/boletin/del\\_dia\\_25\\_de\\_Mayo\\_del\\_2005](http://boeyl.jcyl.es/boletin/del_dia_25_de_Mayo_del_2005).

Society of Castile and Leon 2007-2013”, hereinafter ERSDI, and the Strategic Modernisation Plan for the Public Services of Castile and Leon 2008 – 2011.

The ERSDI<sup>9</sup> develops a set of strategic lines, which can be summarized at global level, in a unique objective, textually: “To advance determinedly in the incorporation of the Autonomous Community of Castile and Leon to the Digital Information Society, by taking advantage of the potential of the Information and Communication Technologies as a tool to facilitate the economic development, the improvement of business competitiveness and productivity, social and territorial equality, the improvement of the quality of life of the citizens..., in short, the growth of welfare”.

A new set of eight strategic lines stem from the strategic guidelines; three of them are tightly linked to the aim of this document and which will be developed next.

### **1.3.1 Telecommunications Management Plan.**

It aims to guarantee affordable and good quality telecommunication infrastructures and services. In this strategic line stands out the initiative “Advanced Telecommunications in the Administration”. This initiative emphasizes the important role of the Castile and Leon Government in the use of innovative technologies, and concerning the interoperability between the Administrations of its territory. In this sense, and after the start up at a national level of the SARA system (System of Applications and networks for the Administrations), the Castile and Leon Government has begun to work to create a regional neutral node which will allow the connection between SARA and the systems of the Castile and Leon Government, the Provincial Councils and the Town Halls of the region.

### **1.3.2 Digital Municipalities of Castile and Leon.**

This strategic line fosters the adoption of some measures for the boost of the Digital Information Society in the municipalities of the Community, as well as the e-administration and interoperability. In this context, the initiative “Network of Digital Municipalities of Castile and Leon.” is presented, and it patronize the platforms of common use to be based on standards “de jure” or “de facto”, as such the IP protocol for data transmission and the XML format for information interchange.

### **1.3.3 E- Administration.**

Strategic line whose aim is to exploit to the maximum the possibilities of the e-administration to provide more effective and quality public services, allowing the citizen to

choose the channel he will use to relate to the Administration. To achieve this, it emphasizes the necessity of coordinating actions, the consolidation of the Single Administrative Information System (SIAU), the start up of the on-line formalities and the interoperability between Administrations. Within its initiatives stands out the “Global interoperability” as the capacity of information interchange between computer systems at the three levels of the Public Administration. The Castile and Leon Government knew how to respond to the challenge and has put all the resources at its disposal into practice in order not left behind from this boosting and to locate the region in a position of advantage as regards the other Autonomous Communities. On the other hand, the Castile and Leon Government works to achieve a modernisation of the Administration of Castile and Leon and that effort results in the Strategic Modernisation Plan for the Public Services of Castile and Leon 2008-2011.

This strategic plan manifests the Castile and Leon Government intention to support the modernisation and innovation by means of the creation of the “Dirección General de Innovación y Modernización Administrativa”, of which we are part, and whose aim is to take advantage of the full administrative interrelation and the technological and networking interoperability to develop a true intelligent and quality management of public services to the benefit of citizens.

The Strategic Modernisation Plan for the Public Services of Castile and Leon 2008-2011<sup>10</sup> determines six strategies, namely: an easy, intelligent, pushing, open, responsible and integrator Administration. These strategies are composed of a total of twenty programmes which define some performing guidelines. In this document, we deal with interoperability, and in this sense and within the strategy of an “Easy Administration”, the “En red” programme is developed. Within its performing guidelines, the 25 line should be highlighted: “Promotion of inter-administrative cooperation and interoperability”.

## **DESCRIPTION OF THE PLAN**

Castile and Leon has a land area of 93,898 Km<sup>2</sup> and a population of 2.5 million inhabitants scattered in 2,247 municipalities. Hence, Castile and Leon is the larger region in Spain and it has the largest number of municipalities. Castile and Leon has 9 provinces and 2,247 municipalities exactly, this help us to realize the difficulties to achieve an interoperability model which allows the interchange of information between the systems of 9 Provincial Councils and 2,247 municipalities. Moreover, we must take into account that the number of inhabitants of many

<sup>9</sup>ERSDI, Regional Strategy for the Digital Information Society of Castile and Leon 2007-2013  
[http://www.jcyl.es/scsiau/Satellite/up/es/Institucional/Page/PlantillaDetalleCon-tenido/1180952673338/Comunicacion/1180419862739/\\_?asm=jcyl&tipoLetra=x-small](http://www.jcyl.es/scsiau/Satellite/up/es/Institucional/Page/PlantillaDetalleCon-tenido/1180952673338/Comunicacion/1180419862739/_?asm=jcyl&tipoLetra=x-small)

<sup>10</sup>Strategic Modernisation Plan for the Public Services of Castile and Leon  
[http://www.jcyl.es/scsiau/Satellite/up/es/Presidencia/Page/PlantillaN3/1144758965918/\\_/\\_?asm=jcyl&tipoLetra=x-small](http://www.jcyl.es/scsiau/Satellite/up/es/Presidencia/Page/PlantillaN3/1144758965918/_/_?asm=jcyl&tipoLetra=x-small)

of these municipalities is very short; hence this level also presents a distinction between those municipalities with a large capacity of investment in Information technologies and those with a lesser one.

We have already mentioned that one of the main initiatives of the Strategic Modernisation Plan for the Public Services of Castile and Leon 2008-2011, in its strategic line 'E-Administration', is the achievement of a global interoperability for the interchange of information between the three levels of the Spanish Administration. In order to reach this aim we must see interoperability from two different perspectives: physical and logical interoperability.

#### 1.4 Physical interoperability.

It refers to the computer systems capability to communicate between them, that is to say, the establishment of a communication channel which allows information interchange between different computer systems at a different level. In this sense, the Corporate Network Service, of the "Dirección General de Innovación y Modernización Administrativa", works in accordance with the ERSDI regional strategy to spread the regional neutral node among the infrastructures of the Castile and Leon Government.

This regional neutral node must allow the communication between the SARA system (Administration Application and Network System) of the Nation, the Administration of the Community of Castile and Leon and rest of local Administrations in the region. Moreover some pan-European e-administration services are accessible in the Internet, but others, due to security reasons, are just accessible using the trans-European network TESTA, to which we would have access through the SARA system. This will provide to the Administrations of our region a channel for communicating and interchanging information with the rest of the European Union Administrations. Concerning this, we can claim that most part of this physical interoperability has already been reached and, that the Castile and Leon Government owns a connection to the SARA network which allows us to enjoy some of the national services which will be mentioned later on this document.

To conclude, we must affirm that the telematic network spread should not be considered as an end, but as a means to reach the interoperable components to achieve some profits which will result in an improvement of the services provided to citizens and companies.

#### Logical Interoperability.

It does not refer to the existence of a communication channel which allows the interchange of information between computer systems, it rather refers to "how" to achieve an information transmission in a coordinate way, that is to say, which language both systems should talk to achieve to

communicate under certain conditions of security, quality and availability.

In this logical interoperability context we may mention two initiatives from the Castile and Leon Government: the Interoperability component with the MAP and the SOA Interoperability platform from the Castile and Leon Government.

#### *Interoperability Component with the MAP (Ministry of Public Administrations).*

The Departmental Innovation and Project Service of the Administrative Innovation and Modernisation Direction, has developed an intermediate gateway between the management headquarters of the Castile and Leon Government and SARA which simplifies the development of any application which may use the services thus provided. The Castile and Leon Government holds this component from April 2006 and it allows it to communicate with the Spanish Tax Agency (AEAT), the General Treasury of Social Security (TGSS), the General Department of Police (DGP) and the National Statistics Institute (INE) using the SARA network of the Ministry of Public Administrations.

Nowadays the photocopy omission services (SCSP) are being used, namely:

- Address information verification Service (SVDR), from the DGP.
- Extended Address information verification Service (SVDRE), from the DGP.
- Identity information verification Service (SVDI), from the INE.
- Identity information consultation Service (SCDI), from the INE.
- Change address communication Service (SCCD), experimental.
- The current payment services offered by the TGSS and the AEAT, although being proven and integrated with the interoperability component, are not in production due to some changes done in the authentication policies.

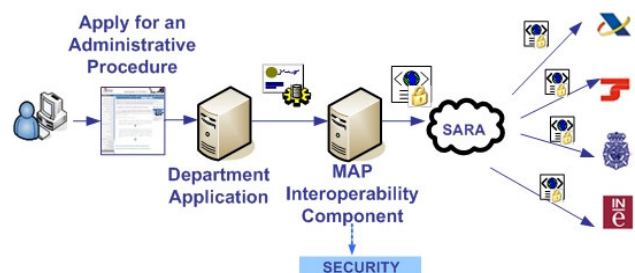


Figure 1. Interoperability Component.

When any Council wants to use one of these services, its applications will have to communicate<sup>11</sup> with the Interoperability Component with the MAP, this component will verify that the civil servant running the application is authenticated thus allowing him to use such service.

The Interoperability Component with the MAP will send every request for information to the SARA network electronically signed due to security reasons, and every operation done will be stored<sup>12</sup> in a database in order to allow the trace of interchanged information. This database could be consulted when required.

### *SOA interoperability Platform of the Castile and Leon Government.*

The Corporate Services and Computer Infrastructures Service of the “Dirección General de Innovación y Modernización Administrativa” works in the study and implementation of a corporate SOA (Services Oriented Architecture) platform to achieve interoperability between the different computer systems of the Castile and Leon Government, and with the other region Administration systems, to join efforts for citizens profit and to achieve the transparency and simplification, the aim of all these strategic lines.

The Castile and Leon Government, according to the strategy established by the IDABC Programme<sup>13</sup>, aims to create a secure and reliable communication platform for data interchange between Administrations and wants this interchange to agree with the XML vocabulary and schemes specifications. The interoperability platform aims to guarantee the cooperation principle in the use of electronic means and the principle of technological neutrality, both mentioned in the Article 4 11/2007 Act for the electronic access of citizens to Public Services.

The task of the interoperability platform implement project is based on three fundamental guidelines:

- Simplify: to simplify will allow us to change from an application interconnection model  $N*(N-1)$  to a

centralised and, hence, simple, manageable and secure model.

- Normalize: it aims to share and consume always in the same way, according to some standards and the technological neutrality principle. Thus, every time a service is to be used it would be known where to access and which steps to take to enjoy it. To achieve it, a change in the distributed system technologies must be taken, from those models based on RMI or CORBA, to an implementation based on Web Services (WS) and organized according to a SOA architecture. Thus, the platform will be based on XML, SOAP and the WS-\* market standards.
- Security: it will be centrally managed and applied at a security control point, known as gateway, and also on Web Services clients. The Security policies which a certain service may need will be defined by the organism responsible for the data used by such service; aiming, in any case, the maximum guarantee of security and availability according to the Article 9 11/2007 Act related to the accordance with Personal Data Protection Act, Organic Law 15/199<sup>14</sup>, de 13 de diciembre, de Protección de Datos de Carácter Personal (LOPD) of December 13(LOPD) and its development regulation<sup>15</sup>. To achieve this in critical cases, security will be applied at two different levels: on the one hand at a protocol level, which will allow to create a confidential channel for the XML messages of SOAP requests to be hidden when travelling from a server to another, and using the server certificates by the Fábrica Nacional de Moneda y Timbre (FNMT)<sup>16</sup>, (the Spanish Mint); on the other hand, we will apply security at a message level, using the WS-Security standard to sign and encrypt the SOAP requests when necessary, component certificates issued by the FNMT will be used for this aim. In the future we expect the SOA platform to support the WS-Policy standard to define and share our security policies.

Besides simplification, normalization and security guarantees, the SOA Interoperability Platform from the Castile and Leon Government will allow us to attach adjuncts and to route and conversion of XML messages. It will also protocol conversion but, in this sense, Castile and Leon Gov-

<sup>11</sup> The interoperability with the MAP component has an interface for the connection of the applications of the Castile and Leon Government based on Enterprise Java Beans (EJB), but this resource is planned to be offered through Web Services soon.

<sup>12</sup> This database will store SOAP signed requests, that is to say, with the XML tags of the WS-Security Standard.

<sup>13</sup> DECISION 2004/387/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 April 2004 on interoperable delivery of pan-European eGovernment services to public administrations, businesses and citizens (IDABC). [http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/oj/2004/l\\_181/l\\_18120040518en00250035.pdf](http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/oj/2004/l_181/l_18120040518en00250035.pdf).

<sup>14</sup> Personal Data Protection Act, Organic Law 15/199 of December 13. <http://www.boe.es/boe/dias/1999/12/14/pdfs/A43088-3099.pdf>.

<sup>15</sup> Royal Decree 1720/2007 of 21 December which approves the Regulation implementing Organic Law 15/199, of 13 December, on the Protection of Personal Data. <http://www.boe.es/boe/dias/2008/01/19/pdfs/A04103-04136.pdf>.

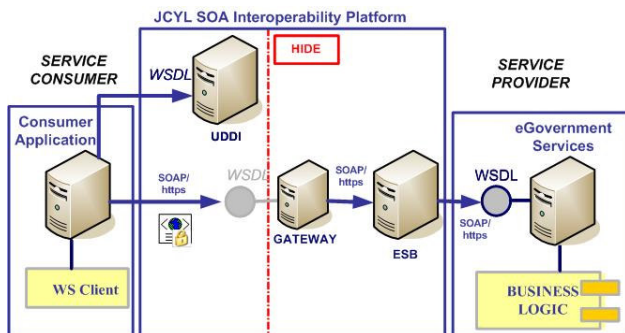
<sup>16</sup> Digital Certificates issued by the FNMT will be required only in production environments. Development and pre-production environments will use digital certificates issued by our own PKI.

ernment decidedly supports the use of Web Services as a means to reach technological neutrality.

From a technological point of view, the SOA interoperability platform will be composed of:

- A service catalogue (UDDI), used as a directory, and available both from the corporate network and the rest of interadministrative networks. This catalogue will include a list of telematic services availables, responsible organism, connection mode, required security policy, etc...
- An integration bus (ESB) responsible for the virtualization of the accesses to final services and the conversion and routing of XML messages when necessary. Every access to the corporate services will be centred in this component, which will allow to avoid scattered environments and to reach a model where centred accesses will guarantee some simplicity in security and management.
- A point (Gateway) where security policies will be applied, and responsible for the validation certificates combined with the @Firma 5.0 program, the decryption of requests, validation message signs, extraction of credentials from certificates, authentication and authorization of access using a directory service (LDAPv3).

The following figure shows the complete model:



**Figure 2. JCYL SOA Interoperability Platform.**

This platform empowers us to offer our services both to Community Councils, Autonomous Organisms and other entities belonging to the Castile and Leon Government, and to Town Halls and Provincial Councils of our Autonomous Community, this will create an interoperability framework also open for the use and sharing of services with the National General Administration and the European Union.

Taking into account the concept of interoperability as a multidimensional reality, as it has been seen in the IDABC Programme and the 11/2007 Act, we may claim that our interoperability model supports the technical aspect, by

means of communication networks, sharing information systems (UDDI, ESB and Gateway) and the use of open standards WS-I, WS-Sec... The semantic aspect will be granted avoiding the information meaning not to be lost during the process, this is achieved using our service catalogue which should clarify the meaning of any data transmitted using this platform. The third aspect: organizational interoperability, it will be achieved reaching some agreements for the use and sharing of services resulting from the collaboration between the agents involved in these procedures.

## IMPACT AND RESULTS

The creation a global interoperability model is not easy task. This decision should always be based on a technical and economical viability study which allows us to recover our investment as soon as possible. In our case, our interoperability model yields the following results:

### Reduction in development time.

Whenever an organization would be willing to use any feature hosted by a Web Service it would know exactly where to find such service, and how to consume it. This will result in a simplification of processes thus reducing development times and resulting in a benefit for developers and therefore, for citizens and organizations.

### Technological Neutrality.

Basing our model on a SOA architecture based in Web Services allows us to establish a layer independent from the underlying technology. Thus, interoperability among computer systems will always be achieved in a simple way, although certain platforms will favour specific uses and characteristics, particularly on security aspects.

### A safer model.

A centralised interoperability model allows us to avoid  $N*(N-1)$  environments where all computers were interconnected. Such models, as the number of systems increased, became unmanageable causing a severe security breach. In our case, security is always implemented, monitored and managed from a centralized point on the server side. This allows us to implement security always in the same and controlled way. Moreover, it helps us to plan and change security policies quite easily when necessary. Policies implementation on the server side will be done through the gateway and, on the client side through agents, handlers...depending on the available platform.

This organization of information transmissions between computer systems allows us to meet the security features required by the Personal Data Protection Act (LOPD) and its development regulation.

### e-Administration Boosting.

The E-Administration Platform of the Castile and Leon Government consists in a group of modules which assure legal guarantees for the procedures that citizens and companies deal with the Administration using telematic techniques. Nowadays, many of these software modules have different connection interfaces from that of Web Services, becoming solutions difficult to manage.

The following table shows some data concerning the most representative modules of the E-Administration Platform of the Castile and Leon Government (ADME).

**Table 1. Datos relativos a la utilización de los módulos software de ADME.**

Módulo de ADME	Datos de utilización.
Telematic Record	280,000 requests
E-Sign platform.	850,000 signs last year.
SMS platform.	145,000 SMS sent.
Payment Gateway.	131,000 procedures. meaning an amount of 128,000,000 €.

When the whole E-Administration Platform use will be normalized, its interfaces will be based in methods implemented by Web Services and all the services will be jointly catalogued and published, its use will be a simpler task and therefore a definitive boost to the platform will be achieved, far overcoming data shown in table 1.

Indeed, the e-administration platform will become the first Big Customer of the Interoperability SOA Platform of the Castile and Leon Government, but it will not be the only one because, so far several Councils have already shown their interest in deploying their services in this platform.

## LESSON LEARNED

Studies and experiences developed so far yield some aspects to take into account:

- Following a strict policy for the use of open standards, thus avoiding, when possible, the adjustments done by the different manufacturers of interoperability platforms.
- Establishing some limits on the size of the documents travelling through the interoperability platform. The XML documents processing is expensive and normal actions such as signing or encrypting documents, may mean large processing time and an exponential increase according to the document size.
- Security is the most critic and complex aspect in the development of a valid interoperability model at the administrations level. It is worthwhile to spend some time developing the appropriate libraries to guarantee

confidentiality, authorisation, integrity and not repudiation of messages shared by computer systems.

- Boosting the creation of normalized schema models for validation.

## FUTURE DEVELOPMENTS

In the development of an interoperability model in a region with the Castile and León casuistic, many things have not been done already. In this sense, we could highlight as future developments:

## **Implementation of the SOA architecture.**

Implementation of the necessary infrastructure for the interoperability SOA Platform of the Castile and Leon Government to be developed, thus guaranteeing the observance of basic security and availability measures. As long as availability is concerned, the necessary research is being carried out to redound the systems of the platform in a backup centre, thus achieving their 24/7<sup>17</sup> accessibility..

### **Development of libraries to apply security measures on the client side.**

As it has been already pointed out, security is a critic and complex aspect and the only way to counteract this complexity is normalizing the procedures of policies implementation. On the server side there is not such a problem because security is implemented in the gateway; but on the client side, and due to the varied casuistic of application servers and their versions is difficult to find an common model which allows us to guarantee security in a simple way. This is the reason why the use of standard security libraries for the Castile and Leon Government might be the best solution.

### **Publication of the services which constitute the E-administration Platform of the Castile and León Government.**

The E-Administration Platform of the Castile and Leon Government is composed by a group of software modules; some of which have already been mentioned. These modules provide of legal guarantee to the telematic procedures. Many of these modules do not present yet a Web Service based interface and due to this reason the modification of such software components -to facilitate their use through the interoperability SOA platform of the Castile and Leon Government- should be considered as a priority. The services of the E-Administration Platform will be published and consumed through the interoperability platform as well as the other services developed by the Castile and Leon Government.

### **Assignment of a Web Service based interface to the Interoperability Component with the MAP and publishing it.**

Nowadays, the component of interoperability with the MAP acts as a client of the MAP Web Services, but the interface it presents to the applications of the Castile and Leon Government is not based on Web Services, it has been developed using Java technology and exactly, Enterprise Java Beans (EJB). This aspect could hinder its consume in the long run, so it is considered most suitable to work on the development of a Web Service based interface and to publish and catalogue them through the SOA Inter-

operability Platform, thus being consumed as any other service.

### **Definition of a training plan.**

In order to achieve the success of such a complex project it is considered essential the definition of a training plan which will allow the different profiles related to the SAO interoperability platform to perform their tasks as good as possible.

And finally, a literal transcription of the Regional Strategy for the Digital Information Society of Castile and Leon 2007-2013 and its declaration of intent: “the Government of Castile and Leon has the vocation to maintain a position of leadership in all the projects at national level which promote inter-operability at any level between the Public Administrations. These projects, in fact, represent a first class opportunity to start up computer processes and systems which directly affect the service provided by the Public Administrations to their citizens”.

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<sup>17</sup> The achievement of a true 24/7 will depend on the availability of the machines where the original services are hosted.

