Prepared for the eGovernment Unit
DG Information Society and Media
European Commission

eGovernment
Interoperability at Local and Regional Level

IOP

Good Practice Case

ICAR - a System for e-Enabled cooperation among Regional, Local and National Administrations in Italy

Case Study

22 August 2006

Case study prepared by Luisella Marcucci, Regione Autonoma Friuli Venezia Giulia in coop. with Stefano Kluzer, CNIPA-Regional Competence Centre Network, and Andrea Nicolini, ICAR project manager, all from Italy and Ralf Cimander (ifib, Germany).

eGovernment Unit
DG Information Society and Media
European Commission

ifib
Institut Européen d'Administration Publique
European Institute of Public Administration
CERTH
The Centre for Research and Technology Hellas

Table of contents

1. ICAR: a System for e-Enabled Cooperation among Public Administrations in Italy

1.1 Case Summary

ICAR (Interoperabilità e Cooperazione Applicativa tra le Regioni e le Province Autonome) is setting up and testing the shared technical infrastructure for applications cooperation among Italian regional authorities, following the national standards defined for development of the so-called *Sistema Pubblico di Connettività e Cooperazione*, SPC (Public Connectivity and Cooperation System).

The SPC model is that of a "light SOA" based on three pillars:

- formalisation of service agreements, which makes it possible to define not only interfaces, but also behaviours, service level agreements (SLAs), security requirements and linkages with domain ontologies;
- definition of a federated identity and access management system;
- definition of metadata (the object of cooperation), semantics and domain ontologies.

The ICAR project (25 M€ budget) is co-funded with 9.5 M€ by *Centro Nazionale per l'Informatica nella Pubblica Amministrazione*, Cnipa (National Centre for IT in Public Administration), within line 1 of the second phase of the Italian e-government plan for regional and local authorities. ICAR's participants are 16 Italian regions (out of 19 altogether) and the autonomous province of Trento; the remaining regions and the autonomous province of Bolzano are constantly informed about the project's developments and are expected to re-use its results.

ICAR aims to overcome the current situation where administrations manage and exchange among them digital information organised and formatted in many different ways, leading to slow information transfer and huge needs for data control and corrections, hence additional costs for the public administration and (unnecessary) requests to citizens and companies to provide their data again and again to public offices.

ICAR's specific objectives are aimed to achieve through ten different sub-projects; three infrastructural projects and seven business application projects.

The infrastructural projects address

- the physical and logical infrastructure for IOP at interregional level,
- the management of SLAs; and
- the implementation of an interregional federated authentication system.

The business application projects aim to test the quality of the IOP services within specific domains where cooperation among regional authorities is crucial: compensations in health services, civil registration services, job and employment services, regional car taxation and others.

I.e. the specific requirement to achieve interoperability was to link the about 10,000 public administration offices concerned by ICAR; this means their directories of services and documents. ICAR is the organisational model to overcome this requirement by acting as a kind of clearinghouse, providing the infrastructure, standards and projects mentioned above.

1.2 Problem addressed

1.2.1 Specific Problem

Local administrations in Italy currently manage digital information which is organised and formatted in different ways in different organisations, and often even within the same organisation. Besides, information flows and exchanges are seldom structured so as to support real-time interactions.

For instance, information regarding a person's name, date of birth, official address etc. which is used by different organisations (for health, fiscal, car registration and other purposes) is seldom consistent across the different information systems, and this generates a huge need and efforts for repeated controls (and often corrections), leading to significant additional costs for the public administration.

Citizens and companies are also affected by these shortcomings, since they are asked to provide or correct their data again and again by the different institutions.

ICAR has identified as a solution to such problems the opportunity to share a common infrastructure for applications cooperation and to standardise information flows among public administrations.

The infrastructure for applications cooperation must meet the national standards defined by CNIPA for the Public Connectivity and Cooperation System, SPC (see § 1.2.2), while at the same time matching the diverse and business-specific service needs of the large number of Regions which have agreed, through ICAR, to make their functioning more homogeneous.

The infrastructure for applications' cooperation which has been designed, and which is partially already under construction, aims to deliver services in different synchronous and asynchronous modes, according to the EDA and SOA approaches.

ICAR is organised into ten sub-projects (see § 1.3). Three of them have an infrastructural character and must define, in terms of the interoperability (IOP) dimensions identified by Modinis Lot 2, the technical IOP layer and syntactic IOP among the Regions, according to national and international standards. The other seven sub-projects must develop applications in specific business domains; hence they address issues at the organisational IOP and semantic IOP layers.

The technical layer is defined by adding to the specification of the SPC the functionality needed for the effective management of SLAs (service level agreements) and of a federated authentication system.

The syntactic layer is defined by selecting standards (XML etc.) independently from the applications which will use them.

Specific problems addressed:

- *To ensure high level integration and interoperability among involved administrations*
- *To guarantee the effective management of service level agreements*
- *To ensure effective authentication through a federated authentication and access management system*

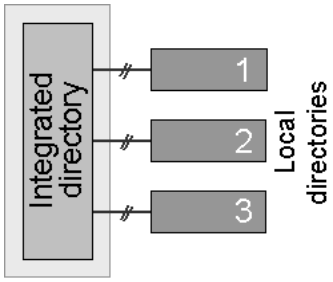
The semantic level is defined on an ad hoc basis within each application sub-project, but following a common general model. The same holds for the organisational IOP layer.

Since ICAR aims to provide full IOP among Italian Regions, it addresses all three service provision levels envisaged by the Modinis IOP Study. However, most efforts do focus on the mid-office and back-office levels.

Service delivery model:
At mid-office level and among back-offices

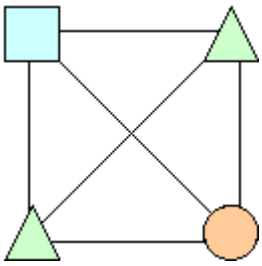
In order to provide its applications cooperation services, ICAR relies on the services directory IOP model already defined by CNIPA. Directories are hierarchically structured at two levels: the national directory and the regional / secondary directories. The national directory holds information about all the delivered services, while the local directories provide "fast" service delivery at the local level.

IOP requirement:
Interoperability between directories of services, at national and at regional levels



Finally, from the organisational point of view, the adopted model is that of standardised inter-organisational workflows, whereby each public administration can request and use the services provided by any other administration for which they are entitled to.

Basic organisational model employed:
Standardised inter-organisational workflows and with regard to the central infrastructural projects, centralisation of functions and developments is also concerned



In addition, as ICAR provides with the infrastructure projects for almost all Italy, i.e. technical developments, standards, management functions, service level agreements, etc. on a rather centralised level, centralisation of supporting infrastructure and developments is also concerned (kind of clearing).

1.2.2 General Background

Italy is subdivided into 19 Regions and two Autonomous Provinces (Bolzano-South Tirol and Trento) which have a special status similar to the Regions and may e.g. enact laws.

The ICAR project covers 16 Italian regional authorities and the autonomous province of Trento, i.e. almost all Italian authorities are covered by the project. The remaining ones are constantly informed on the progress.

ICAR must be seen in the framework of the development of the Public Connectivity and Cooperation System (*Sistema Pubblico di Connettività e Cooperazione* or SPC), which has been approved by the Italian Government on 14 May 2004, following ample concertation among central government, regions and local authorities.

The development of SPC is coordinated at national level by a Commission of representatives from central and local government chaired by CNIPA (see § 1.2.3 on policy context).

The already mentioned inefficiencies of digital information transfer within the public sector have been augmented by the process of administrative decentralisation of competencies from central government to regions and local authorities, which accelerated in Italy over the past five years. The SPC and ICAR are an answer to such challenges: to maintain the unity, quality and economic sustainability of service provision in a large range of public services areas, the actors involved agreed to cooperate in establishing a wide IT-based system, which enables the integration of processes belonging to different administrations into joint inter-administrative processes needed to provide the services requested by citizens and companies.

The SPC consists of a complex set of organisational structures, technological infrastructures and technical rules that will facilitate the interoperability, sharing, integration and exchange of data between all layers of the Italian Public Adminstration (PA) on the basis of secure common standards. It will therefore integrate a communications network - allowing electronic communications among all 15,000 central and local government offices in Italy - and a set of generic services designed enabling seamless interoperation of applications and information systems across the public sector. The new system will replace the current Unitary Network of the Public Administration (*Rete Unitaria per la Pubblica Amministrazione* or RUPA), a broadband network interconnecting public administration bodies (mostly of central government level) across the country, and will provide increased functionalities as well as superior quality and security standards.

Types and levels of agencies involved:

- *16 Regions (out of 19)*
- *1 Autonomous Province out of 2 (Trento)*
- *CISIS (central coordination and management of the project)*

Local government administrations in Italy:

Italy has a large number of LGAs:

- *19 Regions and two Autonomous Provinces*
- *104 additional Provinces*
- *8,102 Municipalities (about 5,800 with less than 5,000 inhabitants)*
- *350 Mountain Communities*
- *Altogether, about 15,000 central and local government offices*

The National Centre for IT in Public Administration

CNIPA was created in July 2003 out of the merger between the Authority for IT in Public Administration (AIPA), an independent body that had been created in 1993 and the Technical Centre of the Presidency of the Council of Ministers, which used to run the RUPA (see main text).
CNIPA is placed under the direct authority of the Presidency of the Council of Ministers, and is responsible for the implementation of policies in the field of information technology in the public sector devised by the Minister for innovation and technologies

The Public Cooperation System model

Given the large amount of architectural/technological solutions already present in the administrations, the need was felt to find out a single infrastructural solution able (i) to preserve the autonomy of the administrations and, at the same time, (ii) to allow the different systems to interoperate to provide integrated services to customers. Moreover, (iii) it needed to be developed on the basis of homogeneous and shared standards, in order to make it possible to plan in advance its mid term evolution. The model proposed for the Public Cooperation System is based on the following principles:

Cooperation among Public Administrations. Administrations co-operate through the supply and use of application services; these services are offered by each administration through a unique (logic) element belonging to their own information system called "Domain Gateway". In this way, full autonomy is assured in the implementation and management of the application services provided, as they can be based on any pre-existent or new application platform, as long as they are supplied through the Domain Gateway. The application services are used through the exchange of messages, whose format is formally specified in the Italian standard of the so-called "e-Government Envelope".

Responsibility. Each cooperating administration is responsible for the services it supplies and for the data provided through these services, which define/create a specific "Application Services Domain" (henceforth, simply Domain). This approach allows for the de-coupling of the different subjects, which keep the elements belonging to them within their own sphere of responsibility.

Agreements. Services work on the basis of an Agreement between at least two subjects (supplier and client); such agreements have both a technical and an institutional/jurisdictional basis. The agreements must be formalised in order to support the development and the life-cycle of services in a (semi-)automatic way. The agreement specification is called "Service Agreement" and is based on the XML language.

Technologies. The application services are supplied/used by means of Web Services technologies and standards. These have been chosen for the huge standardisation effort carried on by international consortia (W3C and OASIS1) and because they are supported by all the most important ICT vendors. Since a deep analysis of SPC's requirements showed that, besides some basic aspects already well defined, a number of advanced aspects had to be addressed, for which web services standards and technologies are today not yet fully mature, it was decided also to

- characterise some advanced aspects through the definition of national standards, to be subsequently developed or adjusted as

Public Cooperation System model:

- *Cooperation among public administration*
- *Responsibility*
- *Agreements*
- *Technologies*
- *Composite and complex services*
- *Evolution*

Advanced aspects, lacking mature standards, and technologies:

- *Protocols for remote invocation, characterised by reliability, auditing and peer-to-peer security*
- *Description of the conversations supported/allowed by the service;*
- *Description of quality of service (QoS) levels;*
- *Description of the end-to-end requisites and characteristics of service security;*
- *Description of the semantic of service and of information carried out by it;*
- *Definition of the architecture and interface of a registry/repository system characterised by a more flexible access*

needed and/or that would have to meet the equivalent international standards when these will become mature enough and will be officially issued;

- define and describe conceptually the Service Agreement (comprising both, basic and advanced aspects) in order to characterise the services. In a first step of implementation, many aspects will be left optional, and they will become compulsory only when standards will be available for them or when an agreement on these aspects will be reached at a national level.

Composite and Complex Services. A group of administrations which need to cooperate in order to provide composite application services form a Cooperation Domain; the services supplied by such a Domain are described externally through Service Agreements, and internally by a specification describing how the different authorities concur to compose the final service, referred to as Cooperation Agreement.

Evolution. Evolution of the SPC model, facing the evolving maturity of standards and requirements of the system itself, has been addressed from an organisational point of view, through the establishment of the SPC Commission (see § 1.2.3), which is in charge of defining possible national standards and/or adopting international ones as soon as they become established and available. The Commission has the formal power to update the specifications on the SPCoop model on the basis of technological progress.

In order to support such a complex model - which we have seen to be based on the SOC (Service Oriented Computing) paradigm and to be organised as a SOA (Service Oriented Architecture) - the definition of different shared elements, in particular specifications and software components, is needed. For this, a new architectural element has been established, referred to as SICA (Services for Interoperability, Cooperation and Access). SICA offers a set of infrastructural services and software components (not belonging to any specific administration), thus having the main purpose of mediating and supporting cooperation among administrations. SICA represents the neutral element which is needed by all the service architectures/SOA to mediate between the different subjects cooperating for the service supply/use.

1.2.3 Policy context and strategy

ICAR and the SPC are part of the Italian national e-Government plan for regions and local authorities, which started in 2002 with the first call for projects issued by the Minister for Innovation and Technologies and the allocation of EUR 120M to cover up to 50% of their cost. Out of 377 submitted projects, 134 were selected and funded, 40 of them dealing specifically with the development of infrastructural services for back and front office. Infrastructural services addressed by phase 1 projects (including front-office projects) are: transport and interoperability services (42 projects), application cooperation services (43 projects), secure access services through smart cards (4 projects), electronic filing and document handling services (12 projects), geographic information services (9 projects).

In July 2003, the representatives of all layers of government met in the so called Unified Conference and approved the document *'E-government for an efficient federalism*', which set a "joint vision" for the development of e-Government and the cooperation between National Government, the Regions and Local Authorities and envisaged the establishment of the SPC. Following this agreement, several working groups co-ordinated by CNIPA were set up to define the overall architecture and functional specifications first of the "connectivity system", focusing on data transport, quality of service and network security aspects (twelve reference documents published in February 2004), second, of the "cooperation system", focusing on interoperability and applications cooperation (ten reference documents published between end of 2004 and October 2005).

The above agreement also led to the launch of the second phase of the Italian e-government programme in August 2003, which was allocated by central government a total of EUR 209.5M, to be complemented with local and EU funds. Line 1 of the second phase is specifically devoted to the development of regional infrastructural services according to the rules and objectives identified for the SPC. 56 projects submitted by Regional Authorities have been approved within line 1, for a total investment of EUR 96M, of which 32M provided by CNIPA. The various sub-projects making up ICAR are also funded under line 1; their overall cost of approximately EUR 25M (of which 9.5M provided by CNIPA) represents about 25% of line 1 total investment.

The last important aspects about the policy context have to do with the legal foundations of the SPC.

The SPC was first legally established by the *ad hoc* Legislative Decree n. 42, February 28th 2005, which also established the creation of the international network of the Public Administration (linking all Italian diplomatic and foreign public offices around the world). Significantly, the Decree states that the development of the

Legal framework

- *The Italian e-Government plan for regions and local authorities funded by the Minster of Innovation and Technologies. 1. Phase (€120M), 2. Phase (€209.5M) plus other funding (EU, CNIPA, local). €25M for ICAR out of line 1 of Phase 2 (see below)*
- *Unified Conference with representatives of all government levels agreeing on a joint vision for eGov and set up of working groups for definition of overall architecture and functional specifications of the connectivity and the cooperation system*
- *Legislative Decree n. 42: creation of international network of PAs and development of SPC is to be governed by Coordinated Commission chaired by CNIPA with representatives from all government levels*
- *Legislative Decree n. 82: Digital Administration Code aiming at providing a single, consistent legislative framework for applying digital technologies in government and for the emergence of an efficient and user-friendly public administration (incl. data produced or processed by a given administration must be made available to other administrations which need it*

SPC is to be governed by a 13 members Coordination Commission, chaired by CNIPA's president and composed by a balanced group of representatives from central and local government: Six members are appointed by Ministries, three by Regional governments and one each by the national associations of Provinces, Municipalities and Mountain Communities.

Digital Administration Code

The SPC is also included in Legislative Decree n. 82, March 7th 2005, which is known in Italy as the Digital Administration Code.

Adopted in its latest version on April 4th 2006 as Legislative Decree n. 159, the Digital Administration Code aims at providing a single, consistent legislative framework for applying digital technologies in government and for the emergence of an efficient and user-friendly public administration. Among a number of rules, obligations, recommendations and targets to promote the use of ICT in the public sector, the Code gives citizens and businesses the right to demand and obtain that public administration bodies use electronic means in their day-to-day relationship with users and mandates public administrations to share relevant information among them by electronic means, in order to make life easier for citizens and businesses. Article n. 50 of the Code establishes that data produced or processed by a given administration must be made available to other administrations which need it to perform their institutional functions, at no cost (but for some exceptions) and through online services built according to the technical rules of the SPC. With articles from n. 73 to 84 devoted to it, the Code confirms the central role of the SPC in the current modernisation effort of the Italian PA and reinforces the legal foundation of its overall architecture and of the governance model which will rule its development.

The Italian e-Government plan for regions and local authorities:

Phase 1

- *134 projects worth 500M€*
- *Involving all 21 Regions and Autonomous and all 101 Provinces;*
- *Involving about 4,000 out of 8,102 Municipalities*
- *More than 80% of Italian population affected by the projects*

Phase 2

Six lines of action

1) Development of regional infrastructural services

2) Extension/re-use of phase 1 front office solutions

3) Territorial Service Centres for small municipalities

4) Projects for "digital citizenship" (e-democracy)

5) Promotion campaigns for the uptake of eGov services

6) eGov services on Digital Terrestrial Television

1.3 Solution

1.3.1 Specific Objectives

The specific objectives of ICAR project are:

- to establish the secure interconnection among regional authority networks following the rules of SPC;
- to guarantee application services cooperation among the PA governments of different Regions;
- to implement and test standard protocols and formats for data exchange among regional authorities and autonomous provinces, taking into account the various critical application or business domains for the delivery of services towards end-users;
- to identify the common specific standards for the federated authentication system and integrate the system thus created with the already existing regional authentication ones;
- to develop case studies in specific application domains aiming at testing the usage of IOP and application cooperation services infrastructures.

Architectural aspects

According to the model agreed upon for the SPC, the application services cooperation is based on the exchange of messages between systems/applications belonging to different organised domains, such as: health services, civil registration services etc. In order to make it work, the exchange of messages must be based on shared rules.

Actually, the messages must have a standard and shared format, at interregional level, both for the "envelope" (which carries information about sender, receiver and other related data) and for its content, e.g. civil registration data of a citizen requesting health services.

Therefore, ICAR must cope with two levels of complexity:

- the infrastructural level, which deals with the general mechanisms and services supporting the exchange of messages across different business domains. Three infrastructural sub-projects INF 1 - 2 - 3 have been designed to solve these fundamental aspects;
- the other, closely linked to the business domain, with respect to the message contents which will be developed through seven application projects or, better, case studies (AP from 1 to 7).

Objectives to be achieved:

- *Establishment of secure connection among regional authorities based on SPC rules*
- *Guarantee application services cooperation among the PA governments of the regions*
- *Implementation and testing of standard protocols and formats for data exchange among public authorities*
- *Identification of common specific standards for federated authentication system and integration with the existing regional authentication systems*
- *Development of case studies in specific application domains aiming at testing the usage of IOP and application cooperation services infrastructures*

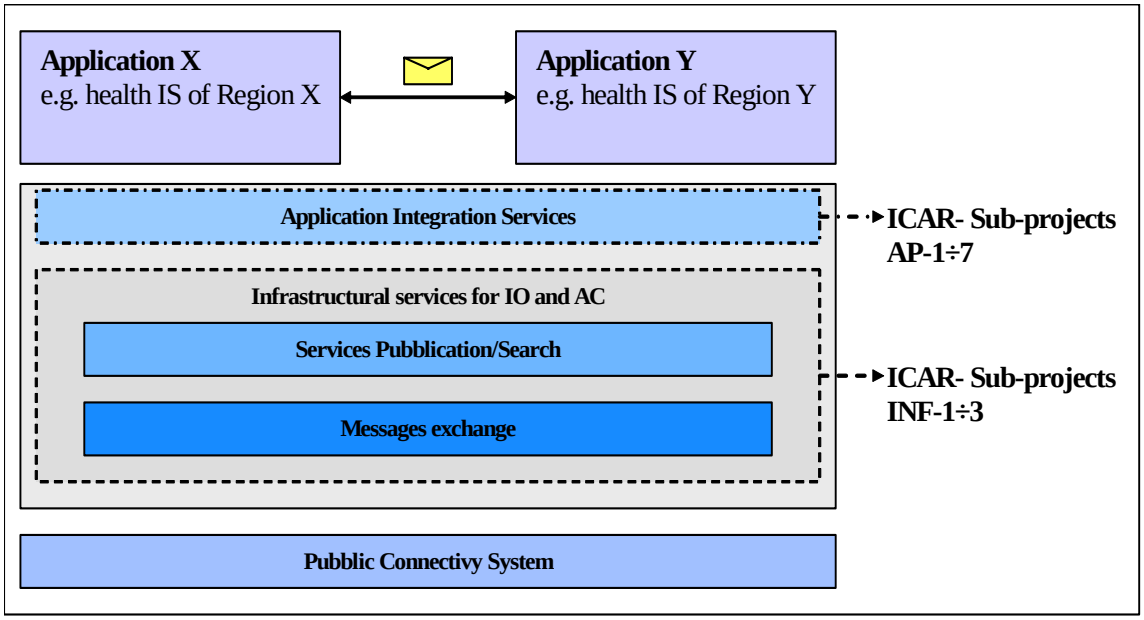


Figure 1: ICAR – Logical architecture

Infrastructural services for IOP e-Application services cooperation

Infrastructural IOP e-Application services cooperation provide general functions which guarantee that the application services belonging to different Regional Authorities are enabled to communicate, according to the interaction paradigms (service request/event notification) and to the collaboration profiles (synchronous/asynchronous) which have been chosen for cooperation at national level.

Such functions are independent from the specific application/business domains and can be distinguished as:

Services publishing and search services

The application services which have been enabled to cooperate must be published by the authority that delivers them, i.e. information which is needed by potential users to access the service – e.g. service description, its physical and logical address, methods for remote invocation and application messages format - must be agreed upon and made available in standard formats, through appropriate schemes. Services for publishing, indexing and searching services can be managed through one or several "Services directories". Such "registry" is a shared resource which, through the appropriate protocols, allows people to publish and search for existing services. The reference standard for Registry's implementation and access is UDDI.

Messages exchange between application services

Communication takes place by sending and receiving a message. Cooperation is made possible by the adoption of a standard format

for the "envelope" of the message (e-Government envelope or an extension of it). The reference standard here is SOAP.

Both types of services rely upon the "qualified Internet" connectivity services planned by the development of the SPC. According the SPC specifications, ICAR will also provide: network resources management services, monitoring the services levels, thus achieving an interregional authentication service.

Application integration services

The application integration services have the task to convert data and documents from the specific format of each regional/local information system into the standard formats agreed upon at interregional level.

The reference standards are XML (for the message content codification) and XML schemes (i.e. DTD and XML Schema), which allow to define the structure of the exchanged messages content and the shared vocabulary.

As it can be seen, the features of the services delivered by the integration layer are strictly connected with the application standards and the information systems which are expected to cooperate. The integration layer must be therefore implemented through specific modules for each application.

ICAR will also ensure the interfacing, if they exist, with the systems which already provide basic IOP and application services cooperation at regional level.

The setting up of this new interregional environment will therefore integrate previous regional ones taking into account these experiences and making safe the relatively autonomous ones.

ICAR project structure

ICAR project is made of ten different sub-projects: three infrastructural and seven application/business-oriented ones (see figure 2). Each sub-project is coordinated by one leading Region and groups a variable number of other Regions/Partners (see table 1).

Case capitalises mainly on following layers of IOP:

- *Technical IOP: Provision of the functionalities and the secure infrastructure for the enclosed authorities incl. authentication based on the specifications of SPC*
- *Syntactic IOP: Provision of standards and standardised Schemes for data exchange based on XML and SOAP independent of the application in question*
- *Semantic IOP: Standardisation of data sets of data commonly used or exchanged. The semantic level is defined on an ad hoc basis within each application sub-project, but following the common general mode.*
- *Organisational IOP: Standardisation of service descriptions based on SPC and described as SOA; for the sub-projects also on an ad hoc basis*

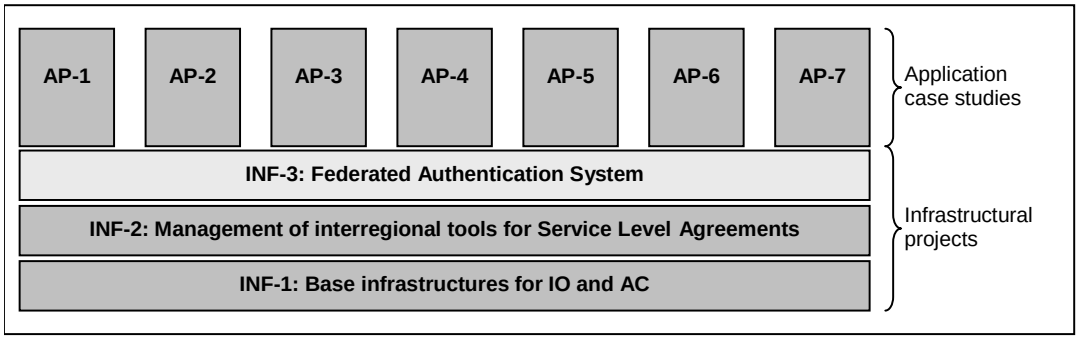


Figure 2: ICAR's sub-projects

Region	INF-1	INF-2	INF-3	AP-1	AP-2	AP-3	AP-4	AP-5	AP-6	AP-7
Abruzzo	R	R	R	R	R	R	R			
Basilicata	R	R	R	LR	R	R				
Campania	R	R	R							R
Emilia-Romagna	R	R	R						R	R
Friuli Venezia Giulia	R	R	R	R	R	LR	LR		R	
Lazio	R	R	R	R	R				R	
Liguria	R	LR	R	R			R	R	LR	R
Lombardia	R	R	R		R				P	LR
Marche	R	R	R	R	R		R	P		
Piemonte	R	R	LR				R	LR	R	
Puglia	R	R	R	R	R	R			R	
Sardegna	R	R	R	R	R					
Toscana	LR	R	R	R	LR	R	R			R
Umbria	R	R	R	R						
Valle d'Aosta	R	R	R						R	
Veneto	R	R	R	R				R	R	R
Prov. Aut. Trento	R	R	R		R					

Table 1: Participation to ICAR projects (Regions/Province and Leading Regions/Province)

As we already said here above, ICAR is organised into ten tasks: the first three have an infrastructural character, while the other seven are basically case studies, aimed at developing application services cooperation.

INF 1 "Implementation of the base infrastructure for IO and AC at interregional level"

The first infrastructural task develops the technological infrastructure on which all the regions could cooperate in order to implement a system of information exchange involving different fields, such as: health system, demographic information system and data, employment, fling system, statistics fuel distribution system and car tax.

INF 2 "Service level agreement"

It aims at defining common and shared services for the management of SLA tools needed for the constant monitoring of the service levels achieved;

INF-3 "Implementation of an interregional Federated Authentication System"

It aims at defining and implementing a federated authentication system at interregional level.

These first three tasks are the ground on which all the IOP and application services cooperation system are based.

The specific objectives of the case studies are:

AP 1: "Interregional cooperation and financial compensation in health services"

This task aims at enabling the cooperation among the health agencies of the regions taking part to the project.

It guarantees a more efficient service towards citizens and a better communication and medical data exchange among regional health services.

It also provides a financial compensation flow at interregional level, when it occurs that a citizen gets ill outside the territory of the Region where (s)he lives.

AP 2: "Cooperation among civil registration services"

This task allows the circulation and exchange of private data pertaining to the regional registers of births, marriages and deaths. Thus, people moving from their towns of residence may get certificates or other services regardless of the geographical location of the front office attended for such request, in spite of the different systems.

AP 3 "Homogenous Organisational Area"

The case study regarding the Homogeneous Organisation Areas is in part an infrastructural task since it provides the creation of a directory containing a list of information regarding the Local Authorities, such as URL address, certificated e-mail and service provision.

The AOO directory, called IPA (Index of Public Administration), contains the e-mail address which turns out to be the online access point to start administrative procedures.

AP 4 "Job and employment services"

It enables the exchange of job requests and offers among local and regional offices of labour.

Supporting infrastructure employed:

3 infrastructural projects:

- *Implementation of the base infrastructure for IO and AC at interregional level*
- *Service level agreement*
- *Implementation of an interregional Federated Authentication System*

Specific 0bjectives to be achieved (case studies):

- *Interregional cooperation and financial compensation in health services*
- *Cooperation among civil registration services*
- *Homogenous Organisational Area*
- *Job and employment services*
- *Regional car tax*
- *Interregional Observatory of the fuel distribution network*
- *Interregional Information System with Cinsedo*

AP 5 "Regional car tax"

It allows the testing of an interregional system capable to let citizens pay car taxes and create and update the public car registry.

AP 6 "Interregional Observatory of the fuel distribution network"

It provides the creation of an interregional fuel observatory related to the fuel distribution system and enables Regions and Autonomous Provinces to share statistical and technical data about the fuel consumption.

AP 7 "Interregional Information System with CINSEDO"

(The Interregional Centre for Studies and Documentation, CINSEDO, is owned by the Regions and the Autonomous Provinces of Trento and Bolzano and acts, among other things, as the support structure of the Conference of the Presidents of Regions and Autonomous Provinces.)

The Interregional Information System enables the creation of statistics federated data-collection system with an only one online access point and it is based on the federation of the regional statistics information systems.

This system supports the policy making processes of the Regional Authorities and the Conference of the Presidents of Regions and Autonomous Provinces.

ICAR Governance

In order to manage such a complex system, the Regional Authorities and Autonomous Provinces have decided to create a set of guidelines capable to handle the various activities of ICAR.

Each one of either the infrastructural tasks or the AP's provides that one of the Regional Authority co-ordinates the activities foreseen by the task itself and is responsible in respect of the other participants to the specific task for carrying out and overseeing both of the IOP layers and application domains provided for by the case study.

Besides, the guidelines foresee a set of Committees, with the supervision of CISIS – Interregional Committee for ICT and Statistics – that has the duty to coordinate the interregional activities necessary for the implementation of the specific regional tasks.

Hereunder you will find a figure of the system of government of ICAR.

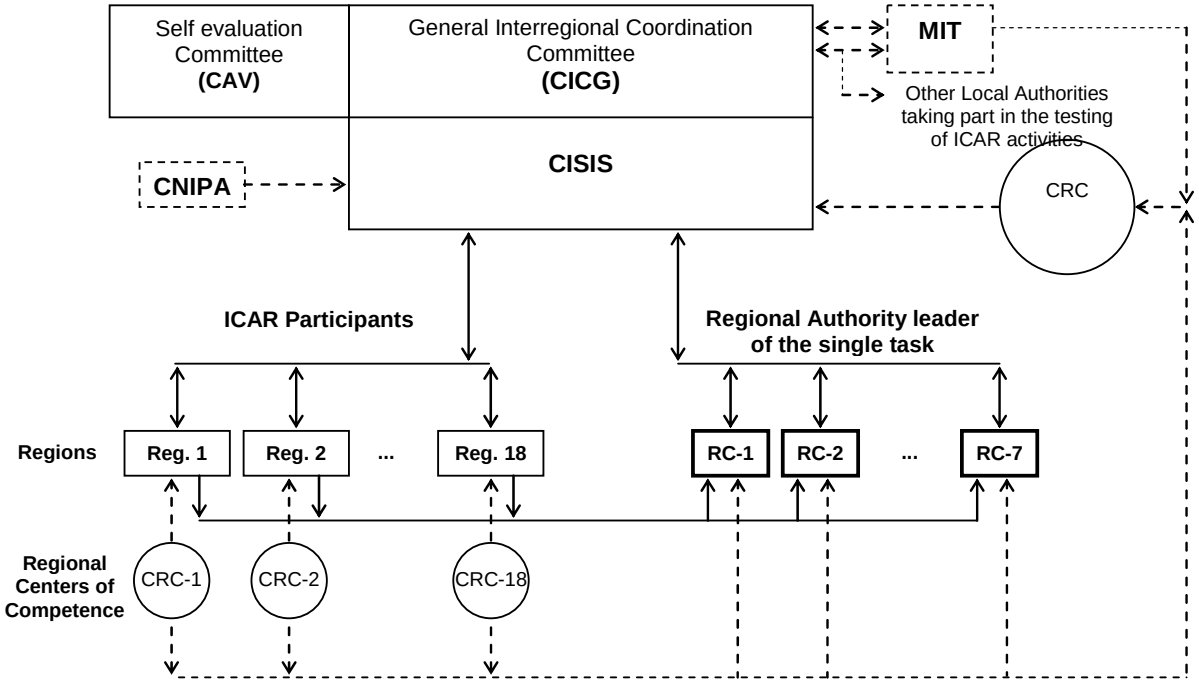


Figure 3: Governance system of ICAR

1.3.2 Implementation

Workflow description

In order to set up the IOP and application services cooperation provided for by ICAR, the workflow plan foresees a set of steps to be checked as the infrastructural tasks begin to create the platform on which all the case studies could be developed and tested.

The main components of ICAR infrastructure will be created by the task **INF1** as follows:

- **Registry of actors and services**
  This registry, unique from a logical point of view, shall contain the description of all the actors (to be seen both as human users and ICT application) who are enabled, with different profiles, to have access to the infrastructure and a description of all the infrastructural an application services that will be accessible through the infrastructure itself.

- **Communication services**
  These services will allow the effective cooperation between the application services interoperating within the different regional territories. They will support:
  - *Notification of events*, i.e. enabling the application to communicate a set of information to another one avoiding the necessary synchronization between the two.
  - *Queries*, i.e. allowing one application to ask another one for a set of information.
  - *Transactions*, i.e., allowing an application to ask another one to change its own status, processing a set of information, previously sent to it, keeping a permanent tracking of this processing or to eventually give back an outcome of it.
- **Services of identification and authorization** with respect to the cooperating application services. This service shall be worked out in cooperation with INF3.
  - Management and monitoring. This part shall be worked out in cooperation with INF2.

Results and products

INF1.R0: Planning and strengthening of the Community Network among Regions and Autonomous Provinces and its starting up.

INF1.R1: Technical and systemic specification of the IOP and application services cooperation infrastructure.

INF1.R2: Reference implementation of the IOP and application cooperation services.

INF1.R4: Carrying out of the IOP and application services cooperation infrastructure in all the Regions and Autonomous Provinces taking part in the project.

INF1.R5: Output of the IOP and application services cooperation infrastructure testing.

INF1.R6: Starting up and putting into service of IOP and application services cooperation infrastructure.

INF1.R7: Evaluation report of the services carried out during the operating activities.

INF2 will enable the following activities:

- **Identifying the parameters** to be used as quality indicators in the evaluation of the services that will be provided for at regional and interregional level.
- **Monitoring and checking** the quality of the services to be provided for by the regional authorities.
- **Monitoring and checking** the quality of the services that cooperate at interregional level.

The technological solution submitted foresees to apply to a regional service centre that has the task to manage the service level index

with respect to the internal system of indicators already existing in each region.

After having received the communication relevant to the services configuration, this Centre will handle the notification of the quality level infringement and the possible interruption and recovery of the services delivery.

The Regions will run these activities on a different basis, according to their position:

Leading Regions:

- To identify the parameters to be used as quality indicators;
- To identify the overall system architecture and the specific ways to cooperate as far as each component is involved, keeping into account the feasibility testing;
- To identify the ICT platform to use, preferably OSS as far as it is possible;
- To coordinate the testing of the system thus set up.

Non leading Regions

- To supply a help in identifying possible adjustments required by the different regional systems;
- To give any possible help to make the system work at its best;
- Testing of the solution;
- To deliver the service provision.

Results and products

INF2.R1: Project management.

INF2.R2: Preliminary analysis and identification of the requirements necessary to make the system work completely and, when possible, to find out market OSS solution.

INF2.R3: To set up the structured architectural system.

INF2.R4: Analysis of the functional requirements.

INF2.R5: Executive project and its implementation.

INF2.R6: Evaluation testing.

INF2.R7: Service provision.

Task **INF3**

It foresees the setting up of a federated authentication infrastructure; as below:

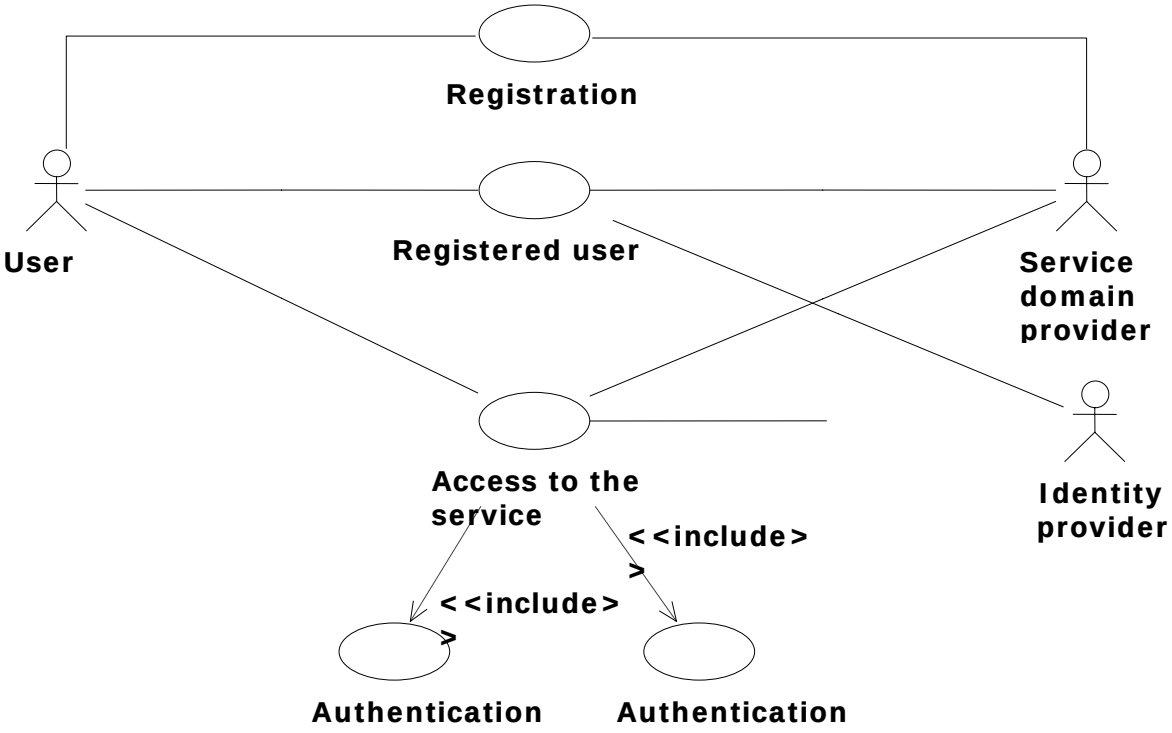


Figure 4: Federated authentication infrastructure

As far as the architectural model is concerned, the main components provided for by this task envisage the development of the following activities:

- To classify the different kind of identities;
- To certificate the right to entry the system. (who is entitled to enter and who isn't) through an identity provider;
- To certificate through an attribute authority different or further information on the user;
- To administer the access policy management;
- To administer a federate system of assertion;
- To provide a community network guarantor who has the duty to control the whole system of access policy.

As far as the seven case studies are concerned, once the IOP infrastructure is working, they will have to carry out the following activities both inside their regional contest and on an interregional level.

AP.R1: To carry out the public procurement procedures necessary to achieve the fulfilment foreseen by the project.

AP.R2: Executive planning.

AP.R3: Achievement and realization of the solution foreseen by the project.

AP.R4: Testing activities.

Security and Privacy

The ICAR project is based on the Community network model. Actually each participant who joins the project is responsible only and solely for the services and information it provides the Community with.

There are different ways of giving a contribution to the Community:

Some simply provide services and information, others only have the use of them, and other have the responsibility to authenticate the Community users. And at last, there are some participants who relate attribution and qualifications to the individual credentials.

The distribution of these responsibilities and information aims at not duplicating the data.

Eventually, there is only one supervisor of a specific set of information.

Privacy protection in the ICAR project

Each administrative domain in the ICAR community network acts as a separate entity for the enforcement of national regulations about the privacy of personal data. There is no special treatment for the community network as a whole, because the underlying idea of a "lightweight domain federation" rejects the idea of the community network as a separate legal person.

Therefore, each domain must individually comply with the regulations in force, and is individually responsible for its enforcement. Each domain which acts as a controller of personal data must process those data accordingly to the laws in force even in those cases, of special interest for the ICAR project, that involve disclosure of data as a consequence of institutional activity, performed via the interoperability infrastructures provided by ICAR.

The several administrative bodies in the ICAR project are responsible for the processing of the data they collect, and this processing is performed by the various instances of the application-level tasks deployed at the data processor's site. As a consequence, the applications themselves must guarantee regulatory compliance, especially for the enforcement of access control policies to only grant access to the right persons in charge of the processing.

In this context, digital identity is a key factor in enabling the enforcement of privacy-protecting policies, which can only take place where a trustworthy digital identity strategy is in effect, so that a digital identity may be guaranteed to be in certified correlation with a specific real-life subject. This is the most important requirement for the whole federated digital identity management infrastructure in ICAR (code-named INF-3). INF-3 will provide application-level task with trustable and traceable digital assertions about the users' identity, and at the same time will provide tools to put users in control of what pieces of information in their digital identities are actually disclosed to applications upon access.

1.4 Features making it a candidate for good practice exchange

1.4.1 Impact

ICAR's impact is not easy to measure, as it will materialise differently in each Region, depending also on the business domain. However, short term and long term effects can be envisaged.

Short term effects have already emerged from the effort put by regional authorities into standardising and optimising the information systems and flows addressed by ICAR. This effort has also involved central government in terms of analysis and possibly revision of existing laws and regulations in order to make the above changes possible (this has happened, for instance, with the Ministry of the Interior which rules over the civil registration service, managed at operational level by each Municipality).

In the longer term, ICAR will benefit the millions of citizens and companies of the regions involved, along with over 10,000 public administration offices, thanks to the increased speed of data exchange and processing, hence reduction of waiting time, and to the improved "quality" of the data exchanged, with the reduction of a number of current shortcomings (e.g. disputes on inter-regional compensations for health services).

Short term effects:
- *Standardisation and optimisation of information systems and flows in regional authorities*
- *Analyses and possibly revision of laws at the central government to enable standardisation and optimisation*

Impact:
- *ICAR will benefit the millions of citizens and companies in the involved regions along with more than 10,000 public administration offices*

Long term benefits:
- *Increased speed of data exchange and processing*
- *Hence, reduction of waiting time and improved quality of exchanged data*
- *Reduction of a number of shortcomings*

1.4.2 Relevance of the case for other administrations that could learn from the experience

ICAR involves directly the regional authorities, but it is relevant for all local administrations (provinces, municipalities etc.), since it is creating a model of cooperation which can be extended and replicated at any government level.

Its most important feature is the definition of a set of implementation specifications for an applications cooperation system, which are fully compliant with the Italian national standards in this domain and make it possible to develop further services for the enforcement of SLA's and the smooth functioning of a federated authentication system.

Besides, the model which is being tested in seven different business-application domains can be replicated with any other information flow currently existing among regions, regardless of the specific type of data being dealt with.

Innovativeness:
- *ICAR is designed to be used by all authorities in Italy and can be extended and replicated at any government level*
- *ICAR is based on a set of implementation specifications which are fully compliant with Italian national standards*
- *The value proved model can be replicated with any other information flow regardless of the sector or specific data concerned*

1.4.3 Transferability

As a model, ICAR can be transferred to any local public administration; while its implementation results can be transferred or extended only to other administrations which are involved in the information flows addressed by the seven application sub-projects.

ICAR's general model could be transferred to any public administration system in Europe and elsewhere, addressing all the IOP layers envisaged by the Modinis IOP Study (technical, syntactic, semantic and organisational).

Transferability:

- *ICAR is designed to be used by all authorities in Italy and hence transferability is a goal in itself (ICAR model to any public administration in Italy and implementation results of sub-projects to the authorities involved in the workflow)*
- *ICAR's general model could be transferred to any PA in Europe*

1.5 Results

Beyond some of the elements already illustrated in § 1.4.1 – specifically, the new way and "mood" of cooperation in the IS domain among Regions, and with Central Government as well, which will bring results well beyond ICAR itself - the project's current advancement does not allow to provide much evidence in terms of results, except for some still provisional achievements in specific business-application domains, e.g. job and labour services, civil registration services, the directory of regional official mail addresses (AOOs) federated with the national directory of public administrations (project AP-3).

Results:

- *ICAR is in its beginning and starts with a new way and "mood" of cooperation*
- *Single service related achievements are already reached*

1.6 Learning points and conclusions

Critical success factors for IOP:

ICAR shows that a shared infrastructure to manage IOP at all levels of government is strongly needed and can be built, based on a light SOA and through a strongly concerted effort among all the partners involved. The following are critical success factors and lessons from the experience to date.

Provision of strong project governance

Where multiple projects are involved they must be planned and developed in a co-ordinated and agreed manner, that is, strong project governance is required. ICAR has established several cross project co-ordination groups for this, including resolving issues across organisational boundaries, which involve all the project's participants in different ways.

Also, there must be a common vision across all involved parties and the capacity, by each partner and by the governance teams, to make decisions for the "greater good" rather than for the good of one single participant to the project.

For this, much help comes from the decision that the business requirements should drive the technology project rather than the other way round.

- *Strong project governance in particular when multiple projects are involved*
- *Working for the greater good of the whole project than for the good one single participant's project; based on a common vision*
- *Business requirements should be the driver, not the technology*

Multi-agency projects have longer lead times

Management of multiple projects needs experienced project managers and considerable co-ordination effort, including at administrative and "political" level. It was found that, even before considering the longer time needed to develop and test systems as the number of organisations involved increases, the start up phase is also affected by lengthy administrative procedures to underwrite all the agreements among the partners and the project co-funder (CNIPA).

- *Consider that multi-agency project have long lead times not only due to implementation reasons but also by lengthy administrative procedures by the partners and funders involved*

Clarification of data ownership

A key issue that has already emerged in ICAR – e.g. with the Ministry of Interior concerning civil registration data - is "ownership": at what point do transferred data become the responsibility of the receiving administration and how should system failures etc. be dealt with. While e-Government is intended to present an integrated, borderless view of Government to the customer, government departments still have to work within their own political, legal and accountability frameworks.

- *The possibilities electronic data interchange enable could be crucial in terms of data ownership. E.g. at what point do transferred data become the responsibility of the receiving authority or how is it warranted that clearinghouses don't use data they are not responsible for?*

Critical success factors for IOP:

Set standards early

It is important that data and other technical standards are set and agreed early in the development process. This is particularly vital where inter-dependent developments are taking place simultaneously in different organisations. It was found, however, that important international standards for ICAR's needs are either missing or only available as *de facto* standards.

- *Standards are vital in particular where inter-dependent developments take place at the same time; they have to be set and agreed early*

All authorities will provide their services via a same infrastructure with same formats/structures.

Also, one organisation should be mandated to "own" the standards and ensure that they are adhered to. In Italy, this is the SPC Coordination Commission chaired by CNIPA (see § 1.2.3).

Agree on collaboration semantics

The agreement of data content of XML schemes and the data interpretation across different administrations and different services plays a key role. Each agency uses its own scheme and data structure based on historical use in order to provide public services. The agencies have to come to a common agreement which means that they have to effect a compromise even if they have to accept changes in their basic data bases. So negotiations e.g. about the interpretation of what is a name, what is an address etc. have to take place and commonly agreed.

- *Cross department/ agency agreement on data content and data interpretation has to be found*

1.7 References and links

Websites (all URL's worked out on the last visit on 08.07.2006):

- www.cnipa.gov.it – provides access to all the technical and policy documents concerning *Sistema Pubblico di Connettività e Cooperazione* (SPC).
- www.cisis.it - the website of CISIS, the association of Regional Authorities for statistic and IT matters, which provides (registered only) access to ICAR project website.

Annex 1: Assessment Questionnaire for the MODINIS Case Descriptions

In order to ensure the case descriptions meet the information needs of stakeholders in interoperability at the local and regional level, we ask you to complete this short assessment questionnaire. Your feedback will be used to improve the next version of the present case and will also be taken into consideration when writing up more cases to be described in the course of the project.

Case being reviewed:……

1.) Information content

a) Completeness of description

1				5
only few relevant aspects				all relevant aspects

b) Detail of description

1	3	5	3	1
too general		right level		too many details

2.) Length of description

1	3	5	3	1
too short		right length		too long

3.) Structure / headings

1				5
unclear				clear

4.) Margins

1 **3** **5**
|----------|---------- --|
misleading not necessary good orientation

5.) Learning potential

1 **5**
|----------|----------|----------|----------|
none at all many new insights

6.) Usefulness for your own work

1 **5**
|----------|----------|----------|----------|
not at all very much

7.) Transferability of case to your country

1 **5**
|----------|----------|----------|----------|
not at all very high

8.) Will you get into contact with the contact person?

1 **5**
|----------|----------|----------|----------|
certainly not for sure

Comments

_____

_____

Your affiliation

☐ local/regional government ☐ national government ☐ IT business ☐ academia

Prepared by:

Ralf Cimander and Herbert Kubicek
Institut für Informationsmanagement Bremen GmbH (ifib)
Am Fallturm 1, D-28359 Bremen, Germany
www.ifib.de
Tel.: (+49 421) 218 26 74, Fax: (+49 421) 218 48 94, email: info@ifib.de

http://www.ifib.de/egov-interoperability

European Institute of Public Administration (EIPA)

Center for Research and Technology Hellas / Institute of Informatics and Telematics (CERTH/ITI)

Prepared for:

European Commission
Information Society and Media Directorate-General
eGovernment Unit

Tel (32-2) 299 02 45
Fax (32-2) 299 41 14

E-mail EC-egovernment-research@cec.eu.int
Website europa.eu.int/egovernment_research

---

eGovernment